

NWO-I

Board Report and Financial Statements

2022

This is an English translation of an official Dutch financial statement. This financial statement is an English translation of the financial statement prepared on June 15th 2023. In case of any discrepancies or possible differences in interpretation between the English translation and the financial statement prepared on June 15th 2023, the latter prevail. The original and official Dutch financial statements are available [here](#)

Foundation for Dutch Scientific Research Institutes (NWO-I)



Colophon

Cover photo

KM3NeT neutrino detector

This KM3NeT neutrino detector at the bottom of the Mediterranean Sea is being used to study neutrinos, uncharged subatomic particles, which shoot right through the earth. The project involves hundreds of lines with thousands of light detectors hanging on the seabed that can show the tracks of passing neutrinos.

NWO-I institute Nikhef is one of the main partners in the KM3NeT project.

Photo: KM3NeT

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Facts and figures

The Foundation for Dutch Scientific Research Institutes (NWO-I) is a research organization under the Dutch Research Council (NWO). This foundation has its registered office in Utrecht. NWO-I consists of the following nine institutes:

- AMOLF Physics of functional complex matter
- ASTRON Netherlands Institute for Radio Astronomy
- CWI Centrum Wiskunde & Informatica
- DIFFER Dutch Institute for Fundamental Energy Research
- Nikhef National Institute for subatomic physics
- NIOZ Royal Netherlands Institute for Sea Research
- NSCR Netherlands Institute for the Study of Crime and Law Enforcement
- SRON Netherlands Institute for Space Research
- ARC NL the collaboration the Advanced Research Center for Nanolithography

In addition, there are about 100 working groups at universities (BUW: University Working Groups Administrative Unit) that are part of NWO-I. NWO-I has a central office, which supports the Foundation Board and the institutes.

NWO-I is part of NWO, which receives a budget for its institutes from the Ministry of Education, Culture and Science. NWO-I also receives funding awarded on a competitive basis from NWO, the European Union, the government and from collaborations with universities, industry and other public and private parties.

At the end of 2022, NWO-I employed a rounded number of 1,598 FTE (1,717 people), including (a rounded number of):

- 522 FTE (560 people) scientific personnel;
- 359 FTE (361 people) PhD students;
- 718 FTE (796 people) technicians and other staff.

NWO-I institutes have an (inter)national role because of the research facilities they maintain or make accessible, a coordinating role in the national research landscape and/or a pioneering role because of the nature and quality of the research. The researchers at the institutes collectively produced a total of 77 dissertations, 1,860 scientific (referenced) publications, and 749 other publications in 2022.

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NWO-I Foundation

Board Report 2022

Foundation for Dutch Scientific Research Institutes (NWO-I)

Foreword

The year 2022 was another successful year for the NWO institutes. Our institutes develop very large infrastructure for research, for their own researchers, but also for colleague researchers from other knowledge institutes within the Netherlands. This research is exciting, takes place at the threshold between known and as yet unknown knowledge, and is extremely relevant. We saw a great deal of movement in this development of new research infrastructure. For example, Nikhef has received a large contribution from the National Growth Fund for the further development of the Einstein Telescope, ASTRON is working on a future upgrade of LOFAR, the world's largest radio telescope, and DIFFER is committed to a new national infrastructure for materials for energy research. Also, the first of the three new ships for NIOZ, the Adriaen Coenen, was launched and christened. Developments towards the future do not stand still, as SRON and Nikhef have jointly submitted a proposal to the Roadmap for Large Scientific Infrastructure (which was honored in early 2023) to participate as a significant partner in ESA/NASA's LISA mission, the first space detector for gravitational waves.

In addition to the wonderful developments in infrastructure, there have of course been plenty of scientific successes at our institutes, many of which have found their way into one of the more than 1,800 publications, contributions to software, algorithms, data collections and patents. Keep in mind the outreach activities diligently deployed by all our institutes year after year as well, where they manage to reach the greater public. This annual report includes a scientific highlight for each institute in a separate box, thus showcasing a series of impressive successes.

But there were also downsides in 2022. For example, war broke out in Ukraine in February, which impacted our institutes, but which was nothing compared to the suffering that fellow researchers had to endure in Ukraine and which caused problems for colleague researchers from Russia and Belarus. As the NWO Board, we responded quickly by setting up an emergency fund for refugee researchers. Some of them found their way to our institutes, were welcomed there hospitably and continued their research to the best of their ability. 2022 was also the year in which the effects of the COVID-19 pandemic were slowly phased out, but the impact on researchers and their research remained perceptible for a long time.

Strides were also made in the area of scientific policy. For example, NWO-I was one of the first in the Netherlands to set up a full implementation plan for Recognition and Appreciation, to be rolled out in 2023. The Permanent Committee on National Institutes (PCNI) issued its recommendation in early 2022, and based on this we launched the Climate Initiative Netherlands (KIN) together with the KNAW and subsequently almost all knowledge institutions in the Netherlands.

Last year, I wrote that the government had decided to invest billions in research and innovation. In the summer of 2022, the minister outlined how this funding would support science. While this is largely good news for universities (via sector plan funding and the starter and incentive grants), there is less direct impact of these additional investments on our institutes, other than through increased budgets in the open competition and more funding for infrastructure and European partnerships. In the coming period, the NWO Board will continue to highlight the importance of national research institutes and adequate financial support for them.

Looking back on 2022, I could not be more pleased and proud of our institutes. I am sure they will be able to surpass themselves again in 2023.

On behalf of the NWO-I Foundation Board,

Prof. Marcel Levi, President of NWO-I

1 Introduction

You have before you the 2022 annual report of the Foundation for Dutch Scientific Research Institutes (NWO-I). In this report, NWO-I provides administrative and financial accountability for its work in 2022. With this publication, NWO-I renders account to its financiers and society at large.

This annual report consists of three parts. The first part is the board report, which includes an overview of the events and financial developments of 2022. It also contains a description of the NWO-I organization.

The second part consists of the financial statements including the accounting policies, balance sheet, statement of income and expenditure, cash flow and explanatory notes thereto.

The third part contains an independent auditor's audit opinion and the provisions from the articles governing the appropriation of the result.

About the NWO institutes

NWO has nine national research institutes, enabling it to act in a targeted and decisive way at the international front of important research areas. The NWO institutes each have a scientific mission of national and international strategic importance and make a specific and unique contribution to the Netherlands' research system. These contributions complement those of other research institutes, both in terms of research by the Netherlands' universities and in terms of applied research by, for example, the Applied Research Organizations (TO2), national knowledge institutes and universities of applied sciences. All NWO institutes work closely with many of these knowledge institutes. The research and facility development at NWO institutes are fueled by curiosity and societal challenges, and they hold leading international positions across their respective fields. The NWO institutes realize knowledge and solutions with scientific and societal impact by conducting, making accessible and disseminating that research in a pioneering way, with integrity and excellence.

Scientific and societal questions of national strategic importance, and the development and operation of (large) scientific infrastructure to answer those questions, require research with long-term commitment and pooling of multidisciplinary expertise and facilities. Our institutes offer the stability, extensive experience, experimental facilities and scientific reputation necessary to achieve these goals. At the same time, our institutes remain responsive and agile to quickly and vigorously anticipate new developments, such as via the new climate initiative, which NWO and KNAW greenlighted at the end of 2021 (see Chapter 3). Because the institute's missions are determined by the NWO Executive Board on a regular basis and updated when necessary, NWO is able to introduce innovations at short notice and respond decisively to developments in science and to questions from society that require fundamental and applied research.

2 Key developments

This chapter sheds light on several impactful developments for NWO-I in 2022. Chapter 3 discusses some other developments and scientific infrastructure in greater detail.

2.1 New NWO strategy

On July 6, 2022, NWO presented its new strategy for 2023-2026 to the Minister of OCW. The NWO institutes feature prominently in this new strategy, due to their national roles in their respective fields. Several of the many ambitions in NWO's new strategy relate directly to the institutes. For example, NWO has the ambition to further develop the portfolio of national research institutes, in close connection with developments in the Dutch and international knowledge sector. NWO also strives to ensure that the institutes provide an inclusive, diverse, open, sustainable and safe working environment that fosters a healthy research culture. A healthy research culture at the institutes increases the attractiveness to all types of talent. This includes a hiring and promotion policy in line with the principles of the national Recognition & Appreciation program. In the area of science policy, there are also a number of ambitions that apply to the entire NWO umbrella organization and are focused on knowledge security, open science, scientific integrity, sustainability and science communication. The actual implementation of the NWO strategy will take shape in 2023.

2.2 Advice from the Permanent Committee on National Institutes

In the summer of 2020, the NWO Executive Board, together with the KNAW, established the Permanent Committee on National Institutes (PCNI), chaired by Professor Wim van Saarloos. The PCNI must advise the boards of KNAW and NWO on developments to which the portfolio of institutes could respond. To arrive at its advice, the PCNI conducted an extensive consultation within all scientific disciplines at the request of NWO and KNAW. Through a series of online sessions, the organization surveyed various fields of science to determine their respective needs. The insights gathered from the online sessions served as the foundation for detailed discussions during a live meeting at KNAW's Trippenhuis on November 11, 2021. Stakeholders from around the country identified topics of great scientific interest that require an institutional approach. In view of the government formation still ongoing at the time, the PCNI issued preliminary advice for the boards of NWO and KNAW in late November 2021. The PCNI noted broad support across all domains for two proposals: a new-style institute for climate research (see also 2.3) and a national institute for data infrastructure, storage and management, both in order to join forces and enable collaboration across domain boundaries. In December 2021, NWO and KNAW enthusiastically began implementing the recommendations provided by the PCNI. They established a Climate Task Force to shape a new-style institute around this climate issue. Regarding data infrastructure, NWO and KNAW conducted a more in-depth analysis in 2022 to pinpoint specific needs and assess the extent to which recently launched initiatives can address those requirements. At the beginning of January 2022, the PCNI presented its final advice, 'National institutes: opportunities for the future', to the boards of KNAW and NWO. In addition to the two important points mentioned above, the PCNI also sees a need to recalibrate the balance between booster financing and long-term funding of scientific infrastructure: while the Dutch funding system provides opportunities for infrastructure renewal, funding for its maintenance and operation is difficult to obtain.

NWO and KNAW responded positively to the recommendations, acknowledging the needs in the two identified themes of climate and data infrastructure. Regarding data infrastructure, NWO and KNAW made a first move in

2022 towards further analysis, mainly by identifying the specific areas where needs exist and to what extent new initiatives that have recently been launched can fulfill those needs. This exercise is not yet complete and will be continued in 2023.

2.3 Climate Initiative Netherlands (KIN)

On the climate theme identified by the PCNI (see above), NWO and KNAW immediately began preparations at the end of 2021 by establishing a Climate Task Force, consisting of 23 scientists from very different backgrounds in early 2022. This focuses on bringing together all the players in the country involved in climate research, forming a new-style institute, and advising on a national research program for integrated climate research. The specific suggestions in the advice relating to the desired characteristics of new-style institutes offer important guidance. This temporary advisory body released the "Climate Research Initiative Netherlands" (KIN) recommendation before summer 2022: a cohesive system with a national center, a major program and a national pact with civil society representatives. The recommendation emphasizes that on top of existing excellent climate research, science must now focus on how to accelerate systemic transitions: urgent changes are needed on many fronts and by virtually all actors in society to mitigate climate risks. This requires an integrated approach, in which scientists from all relevant disciplines work with practitioners to develop and test strategies. To this end, science itself must also change, by becoming more service-oriented and delivering results much faster, by collaborating rather than competing, and by prioritizing impact over excellence.

Immediately after its publication, NWO and KNAW shared the Task Force's advice with all the knowledge institutions in the country: not only universities and colleges, but also the technical research institutes (TO2), the National Knowledge Institutes and planning agencies, and the university medical centers. After a broad consultation in September 2022, NWO and KNAW decided to fully implement the KIN recommendation together with all knowledge partners: 1) the establishment of a new national KIN center, 2) the launch of an innovative national program aimed at accelerating the transitions, and 3) the formation of a pact with civil society partners that contribute to this effort.

In the fall of 2022, NWO provided a start-up budget and appointed a coordinator. The coordinator works with a large group of people from science, government and society in various working groups to further develop the advice and work toward the joint establishment of the KIN and the rapid launch of the KIN program in the first half of 2023.

2.4 War in Ukraine

On February 24, 2022, Russian troops invaded Ukraine. The armed conflict has continued since then and prompted the Netherlands and other European countries to declare far-reaching sanctions against Russia and Belarus (because this country is supporting Russia in this invasion). All the scientific institutions of the Netherlands took a public stance against the acts of war against Ukraine. Cooperation with organizations in Russia and Belarus was frozen. This situation has major implications for NWO-I. Not only are staff members of NWO-I personally affected because they have Russian, Belarusian or Ukrainian ancestry or family members, but also because some institutes work directly with institutes from one or more of the countries at war. Some institutes are also linked to these countries via major international partnerships, and depend on scientific results, knowledge and/or supplies. NWO's Executive Board decided to set up an emergency fund of 1 million euro. The emergency fund is intended to provide support for Ukrainian, Russian and Belarusian staff working at NWO (mainly at the institutes). The Executive Board wants to support them in this regard, for example if they run into (acute) financial problems as a result of the war, because they do not have access to their bank accounts. NWO also believes that Ukrainian researchers who have fled their homeland should be able to count on a safe (work) place. In 2022, some scientists who had fled Ukraine found (temporary) scientific shelter at the institutes.

2.5 Knowledge security

While discussions and implementations around knowledge security were at an advanced stage in 2021, these accelerated in 2022 due to all the geopolitical developments (see above). There is considerable political attention for the subject, which means that the minister made it clear several times during the year that the field needs to expedite the establishment of a knowledge security policy. The minister launched the National Knowledge Security Guideline in early 2022, and the RVO's Knowledge Security Desk has gained steam (and proved very valuable) as well. Within the institutes, much attention has also been paid to the subject and a comprehensive analysis of the "crown jewels" has been made. Guidelines for missions to, cooperation with and recruitment from high-risk countries have also been established. Great strides have been made on the information security front, including the kick-off of the rollout of a joint SOC/SIEM service.

2.6 Board and management

Following the departure of the NWO-I director in June 2021, the NWO Executive Board began to consider the role and position of the NWO-I director, partly with the help of an external consulting firm. During 2022, the Executive Board worked with the institute directors and employee representatives on a change in the governance that should ultimately result in an amendment to NWO's articles, internal regulations and management regulations. Just as in the second half of 2021, the responsibilities of the NWO-I director were distributed among members of the Foundation Board (primarily the president), the NWO-I Director of Operations, and the NWO-I Head of Strategic Support.

The NWO-I Foundation Board decided at the end of 2021 to appoint Professor Jessica Dempsey as the new director of ASTRON effective May 1, 2022. Since the departure of Professor Carole Jackson at the end of 2020, the institute was headed by Professor Marco de Vos. The new director is an internationally renowned scientist with a proven track record. She will focus not only on pioneering new research in radio astronomy, but also on realizing opportunities for greater diversity, equity and inclusion. Before coming to the Netherlands, Dempsey was deputy director of the East Asian Observatory in Hawaii.

On July 1, 2022, Prof. Joost Frenken stepped down as director of ARCNL, having become dean of the Faculty of Science and Engineering at the University of Groningen from that date. As of October 1, 2022, Dr. Wim van der Zande was appointed interim director of ARCNL. Van der Zande knows ARCNL well and has been involved with the institute in the past: shortly after ARCNL was launched in 2014, he acted as a liaison between ASML and ARCNL. Since 2019, he has been an adviser to the Source department at ARCNL and Senior Manager NXE EUV at ASML.

Also on July 1, 2022, the appointment of Prof. Marco de Baar as Interim Director of the NWO Institute DIFFER was converted into an appointment as Director of DIFFER for the total duration of a normal first term, until July 1, 2025. In mid-2020, De Baar succeeded Prof. Richard van de Sanden as interim director, who became scientific director of EIRES (Eindhoven Institute for Renewable Energy Systems), a new institute by Eindhoven University of Technology.

2.7 Organizational development NWO-I

In October 2021, the NWO Executive Board adopted a comprehensive package of measures to make NWO-I financially future-proof. This package consisted of a number of structural cuts and savings through efficiency gains and continued professionalization in operations on the one hand, and a number of structural and one-off reinforcements for the continued development and professionalization of NWO-I on the other. Part of the package also included a housing maintenance fund. In 2021, detailed plans were developed for the continued development of operations within NWO-I, with the goal of gaining added value from collectivity and allowing the institutes to mutually benefit from *best practices* and support and expertise from the foundation's office. The primary goal was to enable employees to practice and support excellent science while allowing managers and administrators to effectively oversee and manage the autonomous institutes and the organization as a whole, in compliance with laws and regulations. In 2022, work continued on developing these plans and they were submitted to the Group Works Council for its opinion. Adjustments in business operations require a great deal of attention and precision, and although the original goal was to complete the decision-making process in 2022, this has not been achieved. Before these plans can be implemented in full, it appears necessary to first achieve further harmonization of work processes in a number of staff areas. This is being addressed, in part, by implementing a new personnel information system. However, progress has been made both in terms of content and administration so that most of the implementation of the changes can be carried out in 2023.

Video analysis sheds new light on bystander behavior on the street

Most knowledge about violence in public spaces is based on what individuals say about the situation afterwards. But with the ubiquitous presence of video cameras, we can now see how people behave during violent situations. Using systematic video analysis, the NSCR examines how bystanders react when they see escalating conflict. When do they intervene? What exactly do they do? And does this actually make a difference? Observations show that bystanders play an important role in preventing and de-escalating violence. How people intervene is influenced by the gender of the people fighting, the severity of the situation and whether they know any of the parties involved, among other factors. People who intervene in a fight thus rely on a wide range of social factors.

Image: NSCR



3 Strategy and research

This chapter discusses the main strategic and scientific developments surrounding the portfolio of institutes as a whole, the national infrastructure, national and international collaborations, and the development of generic science policy within the NWO-I Foundation. We will conclude with an overview of scientific output.

3.1 Other developments in the portfolio of institutes

3.1.1 SEP evaluations and strategic plans

NWO has its institutes externally evaluated every six years. The next evaluations will take place in 2023 and cover the period 2016-2022. The external evaluations are conducted on the basis of the Strategic Evaluation Protocol (SEP) 2021-2027 prepared by KNAW, NWO and VSNU/UNL. On September 7, 2022, the Executive Board gave the formal go-ahead to have the evaluations conducted and determined the general evaluation questions. The basis for the evaluation is the self-evaluation in which the institute argues how it has implemented its strategy over the past six years, what it has succeeded in doing and what challenges it has encountered. Part of the self-evaluation is a strategic plan for the next six-year period. This process began in the fall of 2022, by assembling nine evaluation committees and an external secretariat, and seeking support for the analysis of the publication figures. Before the summer of 2023, all the institutes will have prepared their self-evaluation and strategic plan, and the visits of the evaluation committees will take place in the fall of 2023. In early 2024, the NWO Board will respond to the results of all evaluations.

3.1.2 Minister of OCW policy letter

On June 17, 2022, the Minister of Education, Culture and Science (OCW), Robbert Dijkgraaf, informed the House of Representatives of his plans for higher education and science with his policy letter. The investments proposed by the minister will be paid partly from the Research and Science Fund (5 billion for the next 10 years) and in part structurally (700 million per year). The concrete policy choices and investments for the coming period fall into three main goals: 1) strengthening the foundation, 2) giving space to diverse talent, and 3) increasing social impact and public recognition thereof. Much of the minister's impetus to the system goes toward universities or the competition at NWO. There is virtually no direct funding to the institutes. This is certainly not to say that the institutes cannot benefit from these investments. Examples include ramped-up collaborations with universities, the increase in the budget for large-scale scientific infrastructure and memberships, matching for Horizon Europe projects and the funds for top research.

3.1.3 New DIFFER infrastructure for materials research

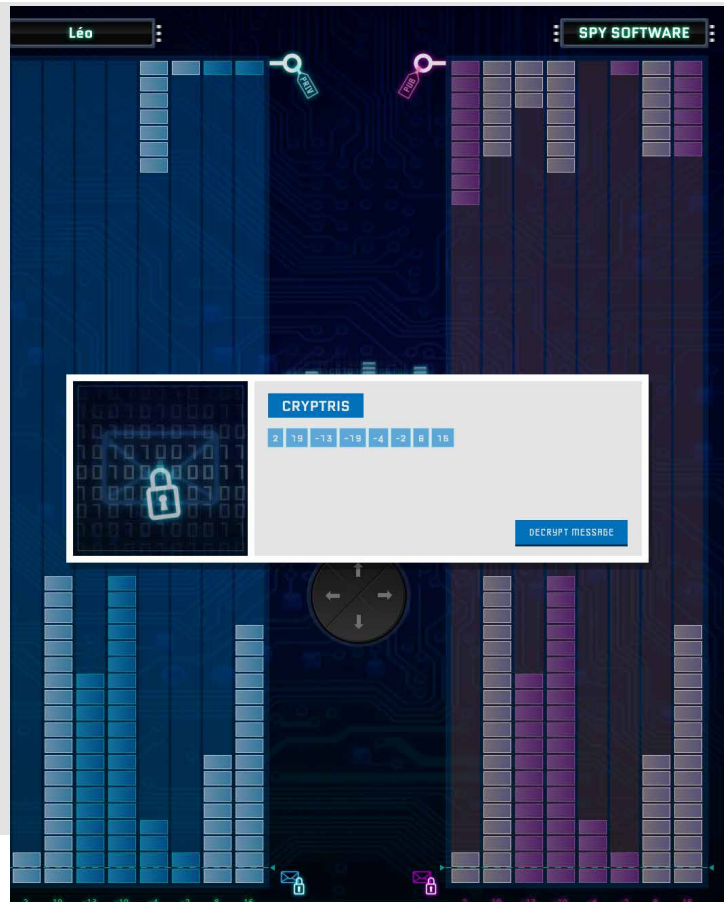
NWO institute DIFFER received executive board approval at the end of 2021 to develop national infrastructure for materials needed for energy research. DIFFER can play an important role in this area thanks to years of experience in the design and management of large nuclear fusion research facilities, such as Magnum-PSI. The proposal came about after consultation with various user groups and an analysis of the institute's strengths. The unique combination of different research tools makes for a highly versatile facility. As such, DIFFER will provide a large group of Dutch materials researchers with the opportunity to conduct materials research experiments specifically focused on energy research. With the plans, DIFFER is taking a new strategic direction and therefore worked hard on a new strategic plan in 2022 in consultation with the research community in the Netherlands. The funding required for this new strategic direction will be partly provided by DIFFER from its own resources and partly through applications submitted in open competition.

CWI contributes to global quantum-safe standards

It has long been known that future quantum computers could be used to attack the most widely used cryptography of today. While current quantum computers are not yet powerful enough, important classified information (such as state secrets) can already be encrypted and stored by adversaries for later decryption by a quantum computer.

To ensure that digital information can be stored quantum securely, the US National Institute of Standards and Technology (NIST) launched an international competition to choose the best cryptographic standards. Leo Ducas of CWI's Cryptology Group is involved in the two main algorithms chosen for 2022: one for public-key encryption (CRYSTALS-KYBER) and one for digital signatures (CRYSTALS-DILITHIUM). They are the result of a multinational collaboration, with participants such as ENS Lyon, Radboud University, Ruhr University Bochum, IBM and NXP in addition to CWI. These standards will be implemented worldwide, protecting the privacy of billions of users.

Léo Ducas/CWI



3.1.4 New scientific plan for a nationally connected CWI

In early 2020, an external authoritative expert conducted an exploration of the positioning and programming of NWO Institute CWI. Starting on October 1, 2020, a new director began implementing the recommendations from this exploration. In 2021, CWI focused on developing a new strategy that prioritizes the science program and further enhancing the institute's national value to Dutch science. To this end, the institute toured virtually every mathematics and computer science faculty in the country. Discussions were held on the requirements and possibilities for collaboration across the country, as well as how CWI can leverage its capabilities and research focus to add value. The starting points for the new strategy were discussed by the Executive Board in late 2021. Just after the summer of 2022, a new strategic plan was provisionally adopted in anticipation of the impending institute evaluation in late 2023. In the new strategy, CWI focuses on four research axes (Algorithms, Data and Intelligent Systems, Cryptography and Security and Quantum Computing). In 2023, the institute will fill five tenure-track positions that will contribute to these four research axes with their research challenges. Given the diversity and inclusion policy and specifically the existing and growing gender disparity, CWI aims to appoint 100% women.

3.2 Scientific infrastructure

Through its institutes, NWO enables Dutch researchers to access national or international scientific infrastructure. The institutes often develop crucial (parts of) large international scientific infrastructures themselves, such as LOFAR, a radio telescope and measurement instrumentation for space missions developed by NWO institute ASTRON. The development of scientific infrastructures often occurs as part of large international consortia in which NWO institutes account for the Dutch contribution or play a coordinating role in the development and construction of technological instrumentation, the maintenance and use of this infrastructure, and the advanced analysis of results needed for scientific users. These are long-term projects: decades of preliminary study, development, construction, testing, and integration of components precede the final scientific experiments for which they are intended.

EUV light manipulation leads to unprecedented possibilities

Using light with extremely short wavelengths, researchers at the Advanced Research Center for Nanolithography (ARCNL) - together with colleagues at research institute AMOLF - can manipulate the properties of materials at the nanometer scale. ARCNL is interested in materials for the computer chip industry.

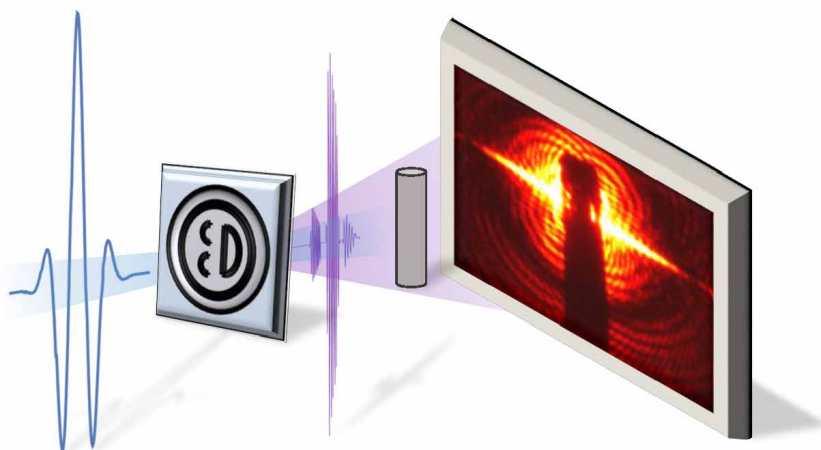
Researchers from Peter Kraus' group have succeeded in controlling extreme ultraviolet light pulses using nanostructures. For this, they used higher harmonic generation: a promising light source for spectroscopic extreme-ultraviolet measurements. Because light with such short waves is immediately absorbed by all materials in the environment, the researchers had to come up with a ruse.

The solution lay in manipulating light at the source using a special nanomaterial. The researchers also showed that even the imaging of complex nanostructures is possible using a similar approach.

After generating extreme ultraviolet light, they first recorded the emission profile of the nanostructures, and then they used this profile to reproduce the structure. The resolution was significantly improved thanks to this technique.

High harmonic generation of complex structured solids.

Credits: ARCNL



3.2.1 Gravity waves in Limburg: the Einstein telescope

The 2017 Nobel Prize for Physics went to the study of gravitational waves, an exciting and new field characterized by an intense collaboration between astronomers and astroparticle physicists. As early as 1916, Albert Einstein hypothesized the existence of gravitational waves based on his general theory of relativity. One hundred years later, they were detected directly for the first time. NWO Institute Nikhef was involved in the detection of these first gravitational waves.

Nikhef has been collaborating with the Province of Limburg for several years to explore the feasibility of constructing a third-generation gravitational wave detector in South Limburg: the Einstein Telescope (ET). At the end of 2019, the ET Pathfinder project was started for this purpose: with European, national and regional funding, a first mini-version of the ET is being built in a laboratory in Maastricht. Groundbreaking techniques will be tested on this mini-version to get a good idea of the technical feasibility of building the final ET. The facility where the ET Pathfinder is being constructed was inaugurated on November 8, 2021, in a ceremony attended by the Minister of Education, Culture, and Science. During the event, the Minister expressed the Dutch ambition to have the Dutch border region near Limburg chosen as the location for the construction of the Einstein Telescope. In 2021, the ET was included in the ESFRI roadmap, the prestigious European Roadmap for Research Infrastructures. Nikhef prepared a funding application in 2021 together with the departments of Education, Culture and Science and Economic Affairs and Climate Policy, the province of Limburg and the Limburg Investment Fund LIOF, with support from many other parties. This involves realizing the Dutch input into the ET with the hopes of it being established in the Dutch border region. An application was also submitted to the National Growth Fund by the Ministry of Education, Culture and Science in 2021. In 2022, it was announced that from the National Growth Fund, 42 million euros will be allocated to the creation of a bid book for the Einstein Telescope in the EMR region, with 870 million euros earmarked for the actual construction of the infrastructure. A Project Office has since been established in Maastricht, initial geological research has been conducted, and R&D with a valorization strategy has been further developed. This has led to great activity in cooperation with the ministries of OCW, EZK, Province of Limburg, LIOF and Nikhef, via agreements as shown in the integrated Action Plan (organization document). Mutual coordination takes place regularly to meet the various challenges. In particular, the financial commitment from the neighboring countries (under the responsibility of OCW) and the feasibility in the region (above and below ground, under the responsibility of Nikhef, the province of Limburg and in cooperation with parties such as TNO and KNMI) are decisive in this respect.

3.2.2 Development and construction of the national research fleet

In 2020, the NWO Executive Board decided to proceed with the purchase of three research vessels: a large ocean-going vessel (the RV Anna Weber-van Bosse), a medium-sized vessel intended for mudflat research (the RV Wim Wolff) and a small vessel (the RV Adriaen Coenen). Construction of the RV Wim Wolff and the RV Adriaen Coenen began in early 2021. In the summer of 2022, the RV Adriaen Coenen was delivered and the RV Wim Wolff will follow in the summer of 2023. In 2022, the tender process for the largest research vessel, the RV Anna Weber-van Bosse, was also completed with an award to the Spanish shipyard Astilleros Armon.

3.2.3 The world's largest radio telescope: LOFAR

The world's largest radio telescope, LOFAR, has the lowest frequency range detectable on Earth's surface and has been operational for 10 years. During this decade, many discoveries have been made with LOFAR that provided new, often unexpected insights. NWO institute ASTRON manages LOFAR on behalf of an international partnership that now includes 54 antenna stations throughout Europe. The upgrade of LOFAR continued in 2022 to further increase its sensitivity and capacity. This can be done with relatively few means, whereby LOFAR2.0 remains the absolute world leader.

3.2.4 Green light for world's most powerful radio telescope SKA

The international Square Kilometer Array (SKA) will be the world's most powerful radio telescope, developed by an international consortium. On February 4, 2021, the associated intergovernmental organization was established. In June, this SKA Organization (SKAO) received approval from the member states to start the construction of the telescopes in Australia and South Africa. Together with its university partners in

A wealth of discoveries through publication of new image of 4.4 million galaxies

For seven years, an international team of scientists mapped more than a quarter of the northern sky using the Low Frequency Array (LOFAR), the world's largest low-frequency radio telescope developed and operated by ASTRON, the Dutch institute for radio astronomy.



This provides an amazingly detailed radio image of more than 4.4 million objects and a very dynamic picture of our universe. About 1 million of these objects had never been detected before. Now that this wealth of data has been made public, everyone can view our universe's most exotic phenomena in a whole new light.

To compile this map, sophisticated algorithms were deployed on powerful computers spread across Europe. Some 3,500 hours of observations were processed, taking up 8 petabytes of disk space - the equivalent of some 20,000 laptops.

Composite image of the remnant of a supernova (exploded star) in the constellation Cygnus. The image is a composite of imaged light waves from different parts of the electromagnetic spectrum: radio waves (LOFAR; purple), UV (GALEX; yellow) and X-ray (ROSAT; blue). This spectacular structure can be found in our own Milky Way.

Credit: Jennifer West

the Netherlands, NWO institute ASTRON has been a major technical and scientific partner in the development of the facility since its inception in the early 1990s. ASTRON also coordinates the Dutch participation in SKA. The first contracts for the participation of Dutch partners in the construction of SKA have since been signed. This means a significant portion of the Dutch investment in SKA will flow back into innovation within our business community. ASTRON is also focusing on establishing an SKA Regional Center, which will provide widespread access to the big data streams generated by the telescopes. Complex and groundbreaking collaborations such as SKA require a long development time from the institute. They pay for themselves through the aforementioned investments in the business sector and, of course, in a wide range of scientific results. For many years, several researchers at ASTRON and Dutch universities have received grants for LOFAR research from the Innovation Boost and the European Research Council (ERC). On December 5, 2022, the construction of SKA officially began. This was initiated with ceremonies in both Western Australia and South Africa. The first major step is expected to be taken in 2024 by merging the setups on both continents into one telescope.

3.2.5 SPEXone instrument for climate research installed

In late June 2022, NWO Institute SRON, together with Airbus and NASA, installed the Dutch aerosol instrument SPEXone on the PACE satellite. From 2024 onward, PACE will make measurements of oceans and aerosols to unravel the impact of particulate matter on climate, among other things. Together with the HARP2 and OCI instruments, SPEXone will provide the spacecraft with a razor-sharp field of view of the earth to measure ocean color and map the properties of aerosols. SPEXone - developed with TNO support - conducts aerosol measurements along with HARP2 and is now the first instrument integrated on the satellite.

3.2.6 Installation of 1,600 radio antennas for AUGER

In the Auger experiment in Argentina for ultra-high-energy cosmic rays, Nikhef worked with Radboud University to install a large portion of 1,600 radio antennas. The so-called "Auger-Prime" upgrade silicon-surface detectors (SSD) were also built in Nijmegen and shipped for installation. The Auger experiment will spend the next few years collecting data at the highest energy, searching for the type of atomic nucleus that strikes the atmosphere, in order to determine from what directions in the cosmos it reaches us. Nikhef anticipates a continuation of this experiment for the next decade.

3.2.7 Quest for sustainable funding for HFML-Felix

HFML-Felix is an internationally renowned institute at Radboud Universiteit that is funded and managed together with NWO-I. The institute combines two major facilities under one roof: a high field magnet laboratory (HFML) and infrared/terahertz free-electron lasers (FELIX). With this, the institute conducts research into the properties and functionalities of molecules and materials, making new scientific breakthroughs possible in the fields of health, energy, and smart materials. Funding from NWO-I dates back to when the NWO-I Foundation was still known as the FOM Foundation; this expired in 2022. In 2022, discussions took place with the NWO Executive Board to explore sustainable funding for this unique facility. This search will be concluded in 2023.

Renewal of Dutch research fleet

A number of important steps toward renewing the Dutch research fleet were taken in 2022. Thus, the first new - and also smallest - research vessel was delivered. The RV *Adriaen Coenen* was christened in Lauwersoog in July 2022 and then sailed to the home port of the NIOZ on Texel. Hard work went into building the aluminum hull of the RV *Wim Wolff*, the replacement for the current *Wadden* and *Delta* research vessel RV *Navicula*. The vessel is expected to be delivered in the summer of 2023. In late 2022, the contract was signed at NIOZ on Texel for the construction of the new ocean-going research vessel the RV *Anna Weber-van Bosse*. Construction can now start on an

innovative, sustainable and distinctive vessel which, in just over two years' time, will replace the then 35-year-old RV *Pelagia*.

C-Job/NIOZ



3.3 Developments in national and international cooperation

NWO institutes engage in national and international collaborations with a variety of partners. As research priorities change or new opportunities for collaboration emerge, these partnerships continue to evolve.

3.3.1 Formalizing collaboration between the University of Groningen and ARCNL

ARCNL is a partnership between NWO, the University of Amsterdam, the Vrije Universiteit Amsterdam, and the company ASML. The institute has been collaborating with researchers from universities across the country in joint research projects since its inception. On January 1, 2022, the University of Groningen (RUG) joined the consortium as an *associate partner*. Cooperation with Groningen had already been established, but this construction will strengthen the ties. The RUG will contribute to the ARCNL program on an annual basis with the deployment of personnel and equipment. The guaranteed term, with the agreement of all the partners, was extended by one year at the end of 2022 until the end of 2028.

3.3.2 National Growth Fund

The government decided in September 2020 to allocate twenty billion euros over five years to investments that contribute to economic growth. The funds, held in the National Growth Fund, are intended for knowledge development, physical infrastructure and research, development and innovation. In 2021, the NWO institutes AMOLF, CWI and DIFFER were successful via participations in proposals that were honored. In 2021, the second round was open for submission of a select number of proposals with support from different line ministries. NWO institutes were involved in several proposals. At the beginning of 2022, it was announced that a number of these proposals had been honored by the government. AMOLF, for example, is involved in the honored proposal Sustainable MaterialsNL (€220m), Green Power II (€500m) and The revolution of smart molecular systems (€97m). DIFFER also participates in the Green Power II project. In addition, there is of course the allocation for the Einstein Telescope (€912m), where Nikhef fulfills an important role.

3.3.3 Development of Delta Climate Center in Zeeland

In the Delta Climate Center (DCC) in formation, the Zeeland knowledge institutes will cooperate with Utrecht University and Wageningen University and the NWO institute NIOZ. The DCC's mission is to realize innovative solutions for a future-proof, safe and prosperous delta. The center will focus on education, research, valorization and business development, thereby increasing the influx of students in secondary vocational education, higher professional education and university education into Zeeland. The plans for the Knowledge Center continued to take shape in 2022. The center is set to launch in early 2023.

3.3.4 European Quantum Software Institute

In 2022, the European Quantum Software Institute (EQSI) was launched with an event in Paris. One of the founders is, - on behalf of QuSoft and CWI - Harry Buhrman. The aim of EQSI is to establish a strong European ecosystem in quantum software and to highlight at the European level the ongoing commitment to scientific excellence and responsible innovation in this field. EQSI wants to further align development processes around quantum software and quantum algorithms by collaborating with industry and quantum hardware partners. Other parties in EQSI include QuMATH (Denmark), PQI (Portugal), TU Munich, University of Latvia and PCQC (France). They have already worked together on projects over the past decades. With this institute, they are intensifying their European cooperation.

3.3.5 LOFAR-ERIC

In close consultation and with the support of the Ministry of Education, Culture and Science and NWO, ASTRON is taking steps to transform the partnership into a European Research Infrastructure Consortium (ERIC). ERIC is a special legal status for infrastructures managed by multiple European countries. A proposal for this was submitted to the European Commission by the Ministry of Education, Culture and Science in 2021. This change in international legal status will give LOFAR a firmer position in the European landscape and ensure long-term stability and a shared vision among partner countries. In 2022, the next steps to establish the LOFAR-ERIC were taken and this will culminate in the actual start in 2023.

3.4 Scientific practice and policy

3.4.1 Scientific integrity

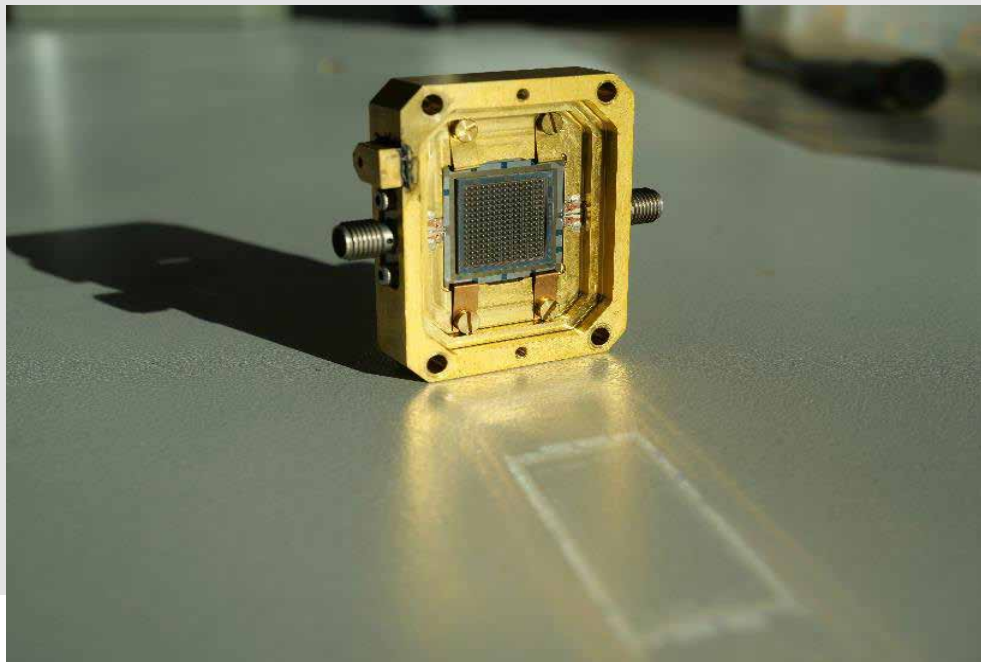
Integrity and the ethical aspects of scientific research are of great value to NWO-I: researchers must be able to work in an open, safe and inclusive research culture in which they discuss the standards of good research practice and hold each other accountable for complying with those standards. It is important to NWO-I that researchers at NWO institutes adhere to the standards. This is why NWO-I employees actively promote and discuss good practices among themselves. NWO-I also places great importance on addressing violations of scientific integrity. Ensuring trust in the ethics of scientific research is of utmost significance for science itself. The Dutch code of conduct for scientific integrity, which has been in force since the end of 2018, includes guidelines for how to deal with suspected violations of scientific integrity. The code formulates duties of care for the institution. In 2020, NWO-I adopted the Complaints Regulation for scientific integrity of the NWO institutes and set up a complaints committee.

In 2021, two confidential advisers for Scientific Integrity were appointed, Professor Thom Palstra and Dr. Tanja Kulkens. They toured the institutes in 2022 to get further acquainted and raise awareness for the topic of scientific integrity. At the end of 2022, Kulkens indicated she would be stepping down as confidential adviser, due to her new position as director of the NWO's Exact and Natural Sciences domain. A replacement is being sought and will hopefully be found by mid-2023.

Far-infrared detector KID achieves highest possible sensitivity

Compared to most other wavelengths, astronomy has a blind spot when it comes to far-infrared radiation. A far-infrared space telescope is only truly sensitive with an actively cooled mirror of 4 Kelvin (-269°C). Such a telescope does not yet exist, which is why little was invested in the development of related detectors. In 2004, SRON decided to break this vicious cycle and invest in the development of Kinetic Inductance Detectors (KIDs). Today, SRON researchers are achieving the highest possible sensitivity, comparable to sensing the heat of a candle on the moon from earth. The background noise of the universe is even slightly stronger, so it would be pointless to make it even more sensitive. Major space agencies see this breakthrough of the chicken-and-egg situation and are considering building satellites with actively cooled mirrors.

Jochem Baselmans / SRON



3.4.2 ScienceSafe

Scientists regularly face threats, intimidation and hate reactions. That is why the Universities of the Netherlands (UNL), NWO and KNAW launched the ScienceSafe platform in early November. The aim of ScienceSafe is to help scientists quickly get the right help in the event of harassment, threats or hate reactions. Together with the person seeking assistance, the employer will look into what help is appropriate and possible. On the website www.wetenschapveilig.nl, scientists who are threatened or harassed can lodge a report 24 hours a day and be assisted further within one working day at the latest, and much sooner in many cases.

3.4.3 Ancillary activities

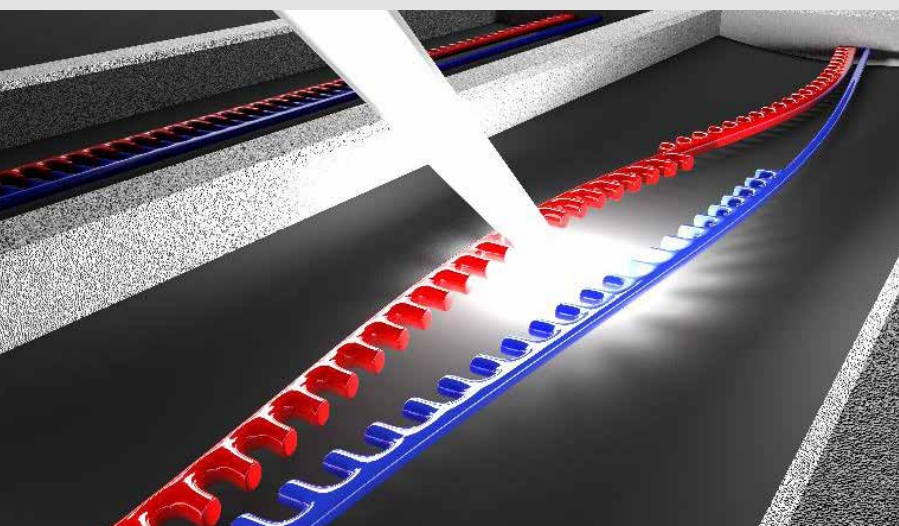
NWO-I wants to be transparent about employees' ancillary activities in order to enhance scientific integrity. Openness is also needed to comply with the Netherlands Code of Conduct for Scientific Integrity 2018: to implement an open and transparent research culture as envisioned in the NWO strategy, and to keep up with the Dutch universities that now have the registration and publication of ancillary activities in order. For NWO-I, ancillary work is "all work that the employee performs in addition to his/her position, regardless of whether that work is performed within or outside of the employee's assigned working hours". In contrast, unpaid ancillary activities of a purely private nature are not considered ancillary activities. Many employees with a double appointment already publish this via the university. As an employer, NWO-I has its own responsibility to provide a complete overview of ancillary activities. In order to enable unbiased review, registration and publication through its own channels are thus preferred. In 2022, the ancillary activities policy was adopted by the Foundation Board and it will be implemented in 2023, simultaneously with a new personnel information system.

3.4.4 Open science - open access policy

Thanks in part to NWO, the Netherlands is one of the global frontrunners in the transition to ensuring free access to publications and research data arising from publicly funded research. By joining cOAlition S in 2018, an international group of research funders, and subscribing to Plan S, NWO committed to implementing far-reaching measures to accelerate this transition to Open Access. The core of Plan S is that all publications

Directing and amplifying sound

Using a network of vibrating nano strings, AMOLF researchers from Ewold Verhagen's group have succeeded in manipulating sound waves in an extraordinary way. The power of light with which they illuminated the strings produced effects similar to the behavior of electrons in a magnetic field. The laser light determines the direction in which sound moves, while blocking sound in the other direction - this is not something that can usually be done with sound waves.



The radiation pressure also allows the sound to become stronger or weaker at will. "Like a child on a swing does by extending his legs or pulling them in at the right time to swing faster or slower," Verhagen said. "We discovered a new interplay of unidirectional behavior and sound amplification. Our research thus opens the way to (meta)materials with properties we do not yet know."

Credits: Ricardo Struik

arising from financing from these research funders must be published in open access journals and platforms as of January 1, 2021, so that everyone can read them.

For NWO-I, this means that all articles published by the NWO institutes are immediately and freely accessible to the larger public as well. To make this possible, NWO-I has committed to two pathways. In December 2020, NWO-I established a policy framework that allows for publications to be made directly available via the so-called "green route". This is based on self-archiving: after publication, a researcher places an article directly into a publicly accessible repository, making the publication freely accessible. The effect of this policy framework on the institutes' OA figures has been monitored since 2021. Now, 90% of the "referenced" academic publications by the NWO institutes are freely accessible to all.

In addition, NWO-I joined negotiations conducted by other institutions, united in UNL, among others, with several large publishers: the so-called transformative deals. A gradual transition to full Open Access is underway via these deals, in line with Plan S.

In 2021, NWO-I established the Digital Competence Center (DCC) and appointed a Data stewardship coordinator. The DCC Provides low-threshold advice, expertise and practical support to researchers at NWO institutes to make their results, research data and software suitable for reuse in the context of Open Science. NWO-I recently became a member of The Carpentries, a non-profit organization that helps set up workshops in the field of reproducible coding and data management. In 2022, four certified instructors were trained under the membership of NWO-I, which now brings NWO-I's total to six. Besides many local activities in the areas of Open Science and open data and software management, a few NWO-I-wide trainings and tutorials were organized as well. The DCC has developed a license tool to help employees find the right license for their data or software.

3.4.5 Recognizing and valuing differently

In 2019, VSNU, NFU, KNAW, NWO and ZonMw published the position paper "Room for everyone's talent; towards a new balance in recognizing and valuing scientists". In it, they indicate how they want to recognize and value the work of scientists more broadly: with less emphasis on the number of publications and citations and more emphasis on other domains in which scientists work, such as education and social impact. This broader form of recognition and appreciation aligns better with the current core tasks of knowledge and educational institutions, as well as with the expectations of society.

In 2020, NWO-I established a committee with representation from all organizational units, scientific and supporting disciplines. The committee then wrote a document specifically for NWO-I outlining the ambition, vision and necessary changes regarding recognition and valuing based on different core domains. These core domains are based on the aforementioned position paper and encompass the national role of the institutes; leadership; research; education; and impact. The committee also makes specific recommendations to ensure that this vision actually prompts change in the organization. The committee engaged with employees in three discussion sessions and sought input on the vision and recommendations.

The vision was finalized over the course of 2022, after which the implementation phase was started in order to actually arrive at a new way of recognizing and valuing. An important element in the implementation is the realization that the entire science system must change: unilateral introduction carries risks, as it could harm the career prospects of employees. NWO is committed to advancing these efforts both nationally and internationally.

The implementation plan was approved by the Foundation Board in November 2022, and the implementation phase has thus begun. The vision includes a statement of intent outlining the ambition and aim for Recognition and Appreciation at NWO-I, and is thereby further developed along the five core domains for NWO-I: the national role, impact, leadership, research and education. For each core domain, the committee shares its vision with recommendations and concrete actions that tie in with these. The actions are taken up by the functional domains and action holders. The premise is that the domain takes the lead in this regard, since it has

the necessary expertise and experience in this domain, and the domain can ensure that the actions tie in with ongoing trajectories in the functional domains, such as the Implementation plan for Diversity & Inclusivity. The action holders of the functional domain examine what is needed to ensure the implementation succeeds and which route best suits the implementation, such as developing an action at the central or local level. This implementation starts in 2023.

3.4.6 Diversity and inclusion

NWO-I strives to create an inclusive organization where everyone feels welcomed, can be their authentic selves, and can maximize their potential alongside their teams. That is why NWO-I strives to be a diverse organization with an inclusive culture where everyone is needed, regardless of cultural, ethnic or religious background, gender, sexual orientation, health or age. To arrive at that point, a new course must be set, and patterns, structures and processes need to be broken out of. Together with NWO, NWO-I focuses on employer policy and encouraging diversity and inclusion via targeted programs. Further on in Chapter 5, we report on the objectives and results of the diversity policy.

Just before summer 2022, the Foundation Board approved an implementation plan for an inclusive and diverse human resources policy at NWO-I. This implementation plan is aimed at all employees of NWO-I, including those at the office organization and those at the institutes. The institutes and the office organization differ in how diverse they are, the bottlenecks they encounter and which points need to be worked on. The 45 action points are therefore not of the same urgency at every division. The plan takes into account that every organizational division is at a different stage of implementation. Every organizational division is given the freedom to set up the process itself. After the plan is adopted, the project leader D&I will enter into discussions with every division to determine what they will take on and when. This project leader started in February 2023. There is also the intention to appoint a diversity officer, who will be responsible for further coordination of the activities, the deepening and broadening of D&I, monitoring and liaison with the outside world. Both the project leader and the diversity officer support the institutes in the local implementation of the plans. The final decision whether or not to appoint a diversity officer will be made at the end of 2023, when the activities have been further elaborated by the project leader and a better estimate of costs in time and hours can be made.

To encourage the recruitment of female PhD students, CWI launched the Constance van Eeden PhD Fellowship in 2022. This offers a doctoral position to a talented young female mathematics or computer science student. It is named after Constance van Eeden (1927-2021), who worked at CWI from 1954 to 1960 and was one of the first female PhD students in statistics in the Netherlands. The first Constance van Eeden PhD fellow started on December 1, 2022.

Also in 2022, NWO-I still had the WISE program with the aim of attracting talented female scientists and technicians/engineers. In 2022, two tenure trackers took advantage of a WISE incentive grant. Further grants will be allocated in 2023.

3.4.7 Knowledge security and cybersecurity

The research at the NWO institutes is of a very high quality, thanks in part to international cooperation and the ability to attract scientific talent from all around the world. This means that a research institute is not bound by political and geographical boundaries insofar as the core academic values remain safeguarded. With the shifting balance of power in the world, the European and Dutch interests in state security and economic strength are coming under pressure, making the acquisition of high-quality knowledge an important aim for economic and military reasons. That is why the national government asks the research institutes to be prudent in how they handle their valuable research knowledge, as well as alert to outside influences affecting the research. That valuable knowledge is often referred to as crown jewels, or the protected interests; knowledge that is crucial for the research institute. This knowledge may consist of technology, knowledge held by a certain person, and everything in between. Knowledge security also concerns the covert influencing of education and research by other states. This interference threatens academic freedom and social safety at research institutions. It also involves ethical issues that may come into play when cooperating with countries that do not

respect fundamental rights contained in the European Convention on Human Rights and Fundamental Freedoms and the EU Charter of Fundamental Rights, among others.

NWO-I wants research at NWO-I to take place in a safe manner and in a safe environment. Doing the research in a safe manner means not only that the core academic values of integrity and independence are respected when conducting the research, but also that the research results can be shared, where possible, in the context of Open Science. A safe environment means that researchers and staff feel free and respected to contribute to research to the best of their ability. Knowledge security policies aim to ensure that research collaborations take place in a safe environment, protect crown jewels from undesired transfer, and safeguard scientific integrity and academic freedom.

Over the course of 2021, the Dutch government, along with all the knowledge institutes in the Netherlands, developed a National Guideline on Knowledge Security, to which NWO-I contributed as well. Key principles of this directive include "open where possible, protective where necessary" and "self-regulation by the knowledge sector is central to the approach to knowledge security". The NWO Executive Board committed to the National Knowledge Security Guideline in late January 2022, making it the policy framework for the development and implementation of knowledge security policies at NWO-I and NWO-D.

In 2022, a comprehensive assessment and vulnerability analysis of the so-called crown jewels was conducted at all the institutions. This culminated in renewed insights about the knowledge security policy. The NWO institutes have made some use of the recently established Knowledge Security Desk. The institutes are very appreciative of the speed with which the desk provides practical and useful answers. Within NWO-I, much attention was also paid in the field of knowledge security, to practical guides on collaborations with institutions from high-risk countries, recruitment of employees from high-risk countries and how to deal with missions to high-risk countries. A start has also been made on working with the entire field on a review framework for sensitive technology. The purpose of that framework is to prevent unwanted knowledge transfer of sensitive technologies from the Netherlands to high-risk countries". The field is still discussing the exact details. The implementation test that will be part of the review framework is due in early 2023.

NWO-I took far-reaching measures to increase cybersecurity across the organization in 2021. It was necessary to strengthen central expertise. In 2021, external experts were engaged for this purpose, including an interim CISO who was also given the role of coordinator for setting up governance in relation to security. A quick scan was also performed to gauge the maturity level of the organization at that time and to determine the level of ambition. NWO-I has set itself the ambition to match the universities in reaching at least level 3 (defined and documented processes; repeatable). As a result of this quick scan, a baseline measurement was started at the end of 2021 by a specialized company to determine whether there are any attention-requiring "lacunae" in the security of the IT infrastructure. The question of whether we might be compromised already (*compromise assessment*) is part of this analysis. NWO-I worked in 2022 on measures to substantially improve and safeguard the security of the IT environments and detect potential security incidents. A baseline measurement conducted in late 2021 provided a good first impression of information security quality and was appreciated by both ICT and institute management. This baseline measurement showed how difficult complex IT environments are to secure, despite all the efforts of the IT departments. Adequate information security is also of great importance for knowledge security and privacy protection, which in practice largely rely on this information security. Precisely because information security knowledge is scarce and costly and there is great demand for highly specialized experts, the obvious course of action is to purchase much of this expertise as a service from specialized companies, such as 24-hour monitoring and periodic testing (so-called SOC/SIEM services). Preparatory work began in 2022 to connect as many institutions as possible to a SOC/SIEM. These services are expected to launch in early 2023.

Information security is becoming increasingly important within NWO-I as well. Growing external threats require high-quality security of (sensitive) data. Therefore, a new Chief Information Security Officer (CISO) was hired in the spring of 2022, after a period of laying the groundwork. This is a new position and the CISO is the spider in the web in the field of (cyber) security, working closely with the Information Security Officers (ISOs) of the institutes. One of the topics the CISO and ISOs have been working on in 2022 is a risk management system. That system is all about classifying risk and ownership of risk. Through the use of practical "tooling" and design of the work process, the additional workload can be minimized. In order for this to tie in well with day-to-day institute practice, the input of the working group is important in classifying the risks and setting up the tooling.

3.5 Impact of the COVID-19 pandemic

The global coronavirus outbreak and government measures to mitigate effects continued to have a major impact on the work being done at NWO-I at the beginning of 2022. From the end of the first quarter, the pandemic had subsided to the extent that much had returned to normal. Hybrid work is clearly one thing gained from the pandemic. Shortly after the outbreak of the pandemic in 2020, the NWO Executive Board established a Coronavirus Fund of €6 million to allow the institutes to do what was necessary to minimize the effects of the coronavirus measures. The fund was later expanded by an amount of €815k and later by another €4.765m from resources of the National Plan for Education (NPO). The Coronavirus Fund also allows for financial compensation for the costs of permanent (technical) staff who could not be productive during lockdown, which meant that delivery deadlines could not be met or additional costs had to be incurred. Later on in Chapter 5, we report on the renewals funded with these NPO funds in 2022.

3.6 Scientific output

Research at the NWO institutes leads to concrete results in many forms. The table below lists the key measurable results. Of the "referenced" academic publications, about 90% are published in open access journals.

Table 3.1 Scientific output of the NWO institutes

Output	Number	Explanation
Academic publications	1860	Publications intended for scientists
- of which in "referenced" journals	1585	Articles in journals that use a peer-review system independent of the editors
- Of which in other journals	275	For example, conference proceedings, but not posters or lectures
Contributions to books	49	Contributions to books that target an audience of scientists and researchers
Monographs	6	Books for scientists and researchers describing results of research
Doctoral theses	77	Dissertations
Professional publications and products	56	Products of scientific research aimed at disseminating knowledge to a wider professional audience (contributions to books, reports, software, CD-ROMs, etc.)
Patents	6	Officially registered patents or patent applications
Publications targeted at the general public	119	Contributions to popular science journals and books for the general public
Other	788	All other publications, this includes algorithms, software, data collections, etc.

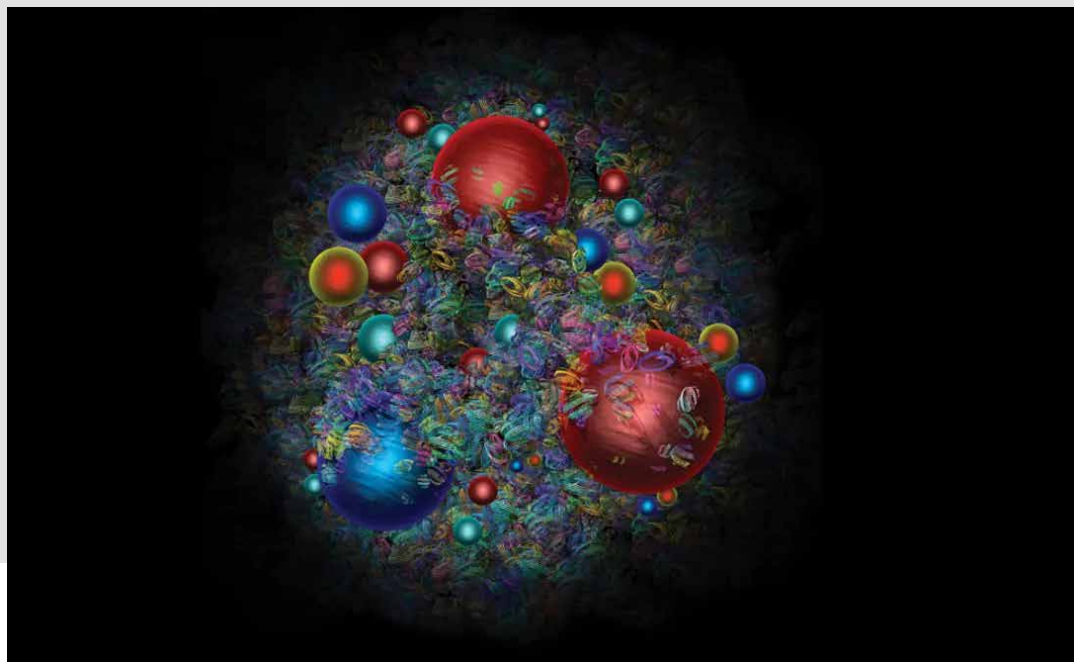
An important addition to the above figures is that due to the war in Ukraine, the number of publications in referenced journals for the NWO institute Nikhef is down about 50. There is no agreement in the major collaborations in which Nikhef always publishes whether authors affiliated with Russian institutes are allowed to be listed in the publications. No decision had been made on that by the end of 2022 (negotiations are deadlocked). No articles have been officially published in these collaborations since February 2022 as a result. They have appeared as preprints, however.

The output indicators mentioned above illustrate the concrete contributions of the NWO institutes. At the same time, they provide little insight into the important contributions that the institutes make to the knowledge field and the Dutch knowledge economy via the national roles they play. This includes the creation of new research directions, the development and maintenance of major research facilities, the facilitation of the use of this infrastructure by others, the coordination of large national research programs, attracting top international talent to the Netherlands, participation on behalf of the Netherlands in international organizations and the provision of education.

A touch of charm in the humble proton

An international collective led by theoretical physicist Juan Rojo of Nikhef and the VU has presented groundbreaking new insights into the interior of the proton. Their results were presented in Nature in summer 2022 and discussed in many scientific media and popular media interviews. Mainstream textbooks say that the proton, the humble nucleus of the hydrogen atom, is composed of three strongly bound up and down quarks. Rojo and his colleagues discovered, however, that experimental data on the proton can only be explained if a hint of charm quarks is also present. An intriguing result, because charm quarks are a lot heavier than the proton as a whole. Rojo explained why this is the result of quantum laws, which allow elementary particles to arise for a very short time and disappear again.

Illustration: CERN



4 Finances

The year 2022 closed with a positive financial result of €23,715k. This was €27,429k better than budgeted.

The improvement in the result compared to the budget was due to several factors.

The main reasons for the improved result were:

- €4m project awards to be spent after 2022 (SKA, emergency fund, SEO)
- €7.7m incidental other income (sale of SRON, etc.)
- €5m due to different accounting treatment of Nikhef renovation (depreciated instead of fully in expenses)
- €2.8m Deferred depreciation charges due to later realization of investments (maintenance, fleet renewal)
- €7.9m various causes, including vacancies, delayed start of programs, etc.

The 2022 figures incorporate the effects of the 2021 decision making on the "Financing of Portfolio". In that context, funding for NIOZ's fleet renewal (€4m per year) was arranged, a solution was found for the uncovered costs of the office organization (€2.5m per year), and additional funds became available for property maintenance (€3m per year). The package consists of additional allocations from NWO (total €6.2m) and cuts (€2.7m generic at the institutes and €0.7m via efficiency measures in operations). Furthermore, a development fund has been established for NWO-I for which a one-time amount of €10m has become available, of which the 1st tranche of €2.5m has been included as income in the 2022 figures. The development fund will finance measures to strengthen cybersecurity and initiatives in relation to human resources policy, among other things.

NWO-I is financially sound. All the institutes are successful in attracting funding from NWO, the EU, and in cooperation with the business sector. Income from work for third parties increased to over €73m, up €2m from 2021. An analysis revealed that the NWO institutes also do well in procedures compared to other institutions. But the fact remains that the competition is great. A buffer capital per institution ensures that fluctuations can be absorbed. One concern relates to the exploitation of scientific infrastructure. In recent years, the NWO institutes have been able to make major new investments, strengthening their national and international position in the scientific field, but there is no provision in the funding landscape for the additional operating expenses incurred. This is particularly true at present for the SKA and LOFAR programs at ASTRON. A solution will be sought in 2023.

Special developments took place at a number of institutions. Nikhef received a growth fund award of nearly €27m. This grant is intended for the activities in the context of the preparation phase of the National Growth Fund project; the Einstein Telescope. Financial bottlenecks of SRON were resolved in 2022. SRON received a structural allocation from NWO for the increased WOZ costs associated with the move to Leiden (€274k), NWO is funding a one-time €1,600k for FIR programs, the Foundation Board has made €1,500k available for human resources policy and a one-time €115k for the completion of obligations in relation to the accommodation in Utrecht.

The lifting of the coronavirus restrictions will allow laboratories to reopen and staff to be present at the institutes more often. The coronavirus funds made available to NWO-I continued to be used in 2022 to mitigate the effects of the coronavirus on research. A sum of €2,202k was made available to the institutes in 2022 to absorb the costs of necessary contract renewals for temporary staff and other situations that cannot be accommodated due to loss of earning opportunities or delays in projects.

The balance sheet total increased in 2022, impacted by capital expenditures and higher liquid assets, to €315,256k. NWO-I closed the 2022 fiscal year with a positive equity of €115,558k. Due to the aforementioned effects, the equity increased in 2022.

Developments in project control

An improvement project in the administrative organization began in 2023. An important component in this improvement project is the use of project control within the organization. In addition to a general assessment that identified improvement proposals, three working groups were formed to harmonize timekeeping, rates and posting runs.

Timekeeping must be integrated at all the institutes (except for NSCR for the time being) by January 1, 2024. To ensure the one-off recording and coordination between project and leave administration, a link is being made between the personnel and financial system and human resources is being included in the workflow of declared hours for sickness, vacation and special leave.

An audit by the EU resulted in comments on the settlement of project grants. A program is underway to resolve the problems. The measures this required became part of the improvement project in the administrative organization.

Developments in operations

NWO-I is engaged in an ambitious program to make its operations qualitatively stronger and more efficient. In mid-2022, following a positive recommendation from the group works council, the vision for business operations was adopted. This vision is fleshed out in 9 domains: Governance, Support & Strategy, Finance & Control, Personnel & Organization, Procurement, ICT & Security, Legal Affairs, Health, Safety & Environment, and Communications. Actions in the financial domain have high priority, also in view of alerts from the auditor. In 2023, these should result in harmonized work processes for all the institutes, a strengthening of project control, and more capacity at the NWO-I office to assist the institutes with expertise, e.g. with regard to fiscal issues.

Related parties and partnerships

A review is currently taking place of NWO-I's related parties. The review is being carried out in response to an internal audit (December 2021) that was conducted for this topic and from which a number of improvement areas emerged. Management decided to implement these areas for improvement. The aim of the review is (1) to complement and if necessary correct the files present with respect to the (known) related parties and (2) to arrive at a new guideline for related parties. The new guideline will replace the old 2014 guideline, incorporating the accepted recommendations from the aforementioned audit.

4.1 Financial developments in 2022

4.1.1 Developments in the financial position

Compared to the position at year-end 2021, the balance sheet total increased in 2022 by €24,696k to a total of €315,256k. This movement is due, on the one hand, to the increase in fixed assets (k€14,645k), as a result of investments in new construction and vessels and renovation of buildings and, on the other hand, to an increase in current assets (k€10,052k), mainly due to a higher balance of liquid assets as a result of grants received that are not given immediately.

Equity increases by the result of the 2022 fiscal year (€23,715k) and amounted to €115,558k at the end of 2022. Equity increased compared to year-end 2021 due to delays in the realization of the new NIOZ fleet relative to expectations. Unforeseeable (incidental) income that is not immediately spent caused the equity position to increase as well. Provisions were discounted in 2022 as an effect of the amendment to DAS 252. As a direct result, the on-balance provisions are lower than the position at year-end 2021 (€826k). The movement in long-term liabilities pertains to the release of the investment grants to cover depreciation costs (€5,168k). Short-term debts changed (€6,975k), which is largely due to 'Projects invoiced in advance' (see table 4.1.1).

Table 4.1.1 Balance sheet total 2022 (x €1,000)

	12-31-2022	2022 Budgeted	12-31-2021
Assets	x €1,000	x €1,000	x €1,000
Intangible fixed assets	3,243	3,365	3,992
Tangible fixed assets	184,636	208,241	169,575
Financial fixed assets	2,332	1,782	1,998
Fixed assets	190,211	213,388	175,566
Current assets			
Receivables	43,235	34,310	54,593
Liquid assets	81,810	51,333	60,401
Current assets	125,045	85,643	114,994
Total assets	315,256	299,031	290,560
Liabilities			
Equity	115,558	78,345	91,843
Provisions	9,472	11,065	10,298
Long-term liabilities	74,235	103,515	79,403
Current liabilities	115,991	106,106	109,016
Total liabilities	315,256	299,031	290,560

Table 4.1.2 Financial key figures NWO-I

RATIOS	12-31-2022	2022 Budgeted	12-31-2021
- Solvency	37%	26%	32%
- Balance sheet total	315,256	299,031	290,560
- Working capital	9,055	- 20,463	5,978
- Current ratio	1.08	0.81	1.05

Solvency indicates the ability of NWO-I to meet short and long-term payment and repayment obligations. Solvency is calculated by dividing equity by total assets. The percentage obtained indicates what percentage of the total capital consists of equity, from which the percentage of borrowed capital can be deducted. A solvency between 25% and 40% is considered satisfactory. NWO-I shows solvency ratios that fall within that "normal" standard. The working capital is the difference between current assets and current liabilities. NWO-I's working capital increased by €3,077k to €9,055k in 2022. This was mainly the result of the increase in liquid assets.

The current ratio reflects the extent to which current liabilities can be paid from the totality of inventories, short-term receivables and liquid assets. The current ratio at the end of 2022 was 1.07, thus marginally higher than at the end of 2021. Given the commitment of the most important funder, NWO, this ratio is adequate. To avoid the decrease in liquidity resulting from the fleet replacement and the renovation, a long-term loan was agreed with NWO. Depending on the liquidity position, the first tranche of 2023 will be paid out at a time yet to be determined.

Table 4.1.3 Liquid assets according to cash flows

Liquid assets according to funding flows	12-31-2022	12-31-2021
	x €1,000	x €1,000
- Cash flow from operating activities	49,045	-17,229
- Cash flow from investing activities	-27,636	-28,886
- Cash flow from financing activities	-	-
- Other balance sheet movements	-	-
Movement in liquid assets	21,409	- 46,115

The liquid assets increased in 2022 by €21,409k to €81,810k. Cash flow from operating activities resulted in an increase in liquidity of €49,045k, mainly due to the net income and expenditure adjusted for depreciation and provisions (€14,038k), decrease in Receivables (€11,358k) and a decrease in Liabilities (€306k).

The negative cash flow from investing activities (€27,636k) mainly relates to investments in tangible fixed assets (€28,654k). Virtually no investments in intangible fixed assets took place.

4.1.2 Treasury

The rules for investing and borrowing money on NWO-I resources are laid down in the treasury rules.

The treasury rules were drafted based on the relevant legal framework (the 2001 / 2016 Government Accounts Act). The mandatory liquidity prognosis for at least five years is prepared quarterly. The legal framework is also constituted by the Regulations on investing, borrowing and derivatives OCW 2016 and the Treasury Banking regulations for local governments.

The treasury rules were updated in 2021. The premise of the treasury function is that NWO-I monies may not be invested or used to borrow money against. All liquid assets are held at the Ministry of Finance, via Treasury banking, with the exception of a specific bank account for SRON and a US dollar account at CWI.

Included under the item Long-term loans are investment grants received in advance.

4.1.3 Developments in income

The basic grant that the NWO institutes receive is largely provided by NWO. This so-called State contribution was over 63% of the total NWO-I income. In addition to this state contribution, NWO-I also secures grants competitively from NWO and external financiers. This 'income from work for third parties' amounts to about 30% of the total NWO-I income. Other income was higher than usual in 2022, due to the sale of the "old" SRON property, and accounts for about 6% of total income in 2022.

Of the grants secured competitively, some 40% came from NWO and 21% from international organizations such as the European Union and ESA, 8% from National governments including the Ministry of Economic Affairs and Climate Policy (EZK) and the Ministry of Education, Culture and Science (OCW), 17% from other non-profit organizations including universities, 5% from companies and 10% from others.

The realized income in 2022 was €22,974k over budget (see Table 4.1.4).

Causes are:

Higher state contribution €10,723k:

- wage, price and energy compensation (€6,323k)
- increased Dutch contribution to SKAO (€2,393k)
- Ukraine emergency fund (€1,035k)
- SEO scheme (€660k)

Higher income under Government contributions and grants €633k

Higher income from work for third parties €3,839k, because of higher project income

Higher Other Income €7,729k, related to property sales.

The income in 2022 was €26,924k higher than the income in 2021, firstly, because of higher State contributions (€17,911k) due to a higher base grant as a result of the 2021 wage and price compensation and additional funding for the NWO-I office (€4,147k), wage, price and energy compensation 2022 (€6,323k), higher SKA-O funds compared to 2021 (€3,993k) and higher project-based and one-time allocations including the NWO-I development fund and the Ukraine emergency fund (€3,268k). Secondly, due to less Other government contributions and grants as a result of reclassification to Income from work for third parties (€1,168k). Thirdly, due to higher Income from work for third parties (€2,330k) mainly due to higher project income with the start-up of projects after the coronavirus period. And finally, as a result of higher Other income related to the incidental gain from the sale of the SRON premises (€7,852k).

4.1.4 Developments in expenditure

The total expenditure in 2022 was €2,648k lower than budgeted, of which:

- Personnel expenses, €5,101k higher:
 - o €211k higher direct personnel expenses,
 - o €5,332k higher other personnel expenses and
 - o €441k higher compensations received.

Direct personnel costs were higher on the one hand as the new collective labor agreement drives labor costs; on the other, the difficult labor market situation caused direct labor costs to rise slightly on balance as vacancies remain open longer. Other personnel expenses were higher because the cost of hired, external personnel was substantially higher than budgeted. Outliers can be observed at ASTRON, CWI, NIOZ, Office and General.

- Depreciation expenses €1,110k lower, mainly due to later start of the Nikhef renovation and NIOZ fleet renewal and a larger release of investment grants.
- Housing expenses €1,722k lower:
 - o higher rental costs (€798k),
 - o lower maintenance costs (€797k),
 - o higher energy costs (€1,389k) and
 - o lower other housing expenses (€3,265k), as Nikhef retroactively capitalized the consulting costs for the renovation.
- Other expenses, €4,918k lower. With respect to the budget, a reclassification has taken place at ASTRON with regards to the SKA contribution, between the items 'Administration and management costs' and 'Other management costs'. Partly because of this, the
 - o Administration and management expenses are (€16,053k) higher;
 - o Other expenses (€22,434k) are lower;
 - o Inventory and equipment (€909k) is higher; this is partly due to the AMPHOS laser that was taken into use later;
 - o The allocation to other provisions was (€554k) higher in connection with the adjustment of the provision for PiMu.

Table 4.1.4 Budgeted and realized income and expenditure 2022 (x €1,000)

	2022 x €1,000	2022 Budgeted x €1,000	2021 x €1,000
Income			
State contributions	154,683	143,960	136,772
Other government contributions and grants	682	49	1,850
Income from work for third parties	73,226	69,337	70,897
Other income	14,403	6,674	6,551
Total income	242,994	220,020	216,069
Expenses			
Personnel expenses	139,643	134,542	139,917
Depreciation/amortization	8,499	9,609	6,830
Housing expenses	11,876	13,598	15,349
Other expenses	61,064	65,982	56,518
Total expenses	221,083	223,731	218,614
Balance of income and expenditure	21,910	-3,711	-2,544
Realized revaluation	-	-	-
Financial income and expenditure	1,433	-3	8
Result	23,343	-3,714	-2,536
Taxes	-	-	-
Result from participating interests	372	-	-254
Result after taxes	23,715	-3,714	-2,790
Third-party share in result	-	-	-
Total net result	23,715	-3,714	-2,790

4.1.5 Developments in the result and equity

NWO-I's result developed positively in 2022. The budget had assumed a negative result, but due to higher income and lower expenses, the result in 2022 was considerably more positive than budgeted (€27,429k). This is partly because the 2022 budget was adopted in September 2021 and was based on the facts known at the time, and partly because unforeseen 38 one-off allocations from NWO, which do not directly lead to expenses, ensured a larger positive result than anticipated.

The result causes movement in the equity mainly in the public earmarked reserves (€17,515k), for example because research funds are spent later than when they were received, such as at the end of FOM's granting activities. Part of the result (€7,158k) is added to the General reserve as the result of the sale of the SRON premises in Utrecht. The remainder of the result causes movement in the Earmarked Funds and the Other Legal Reserves as a result of the depreciation on the capitalized construction of the finance system.

4.2 Description of the key risks and uncertainties

NWO-I's risk appetite is low. This is mainly because NWO-I operates with public funds that must be spent on the intended purposes under transparent conditions. The risks taken by NWO-I fall under regular business activities and are related to conducting research and operating and maintaining the institutes. NWO-I has set up various controls (as per the AO manual) for segregation of duties, authorization of roles/rights.

Risks classified as "high" are:

- Digital intrusion at NWO-I;
- Insufficient resources to replace/update outdated (major) infrastructure;
- Discrepancy between ambition and the knowledge and capacity it requires;
- Failure to satisfy grant conditions.

Table 4.2.2 lists the effects, causes and associated control measures that mitigate these risks.

How does NWO-I handle risk management?

When making decisions, it is important to understand the (potential) risks involved. This enables NWO-I to make a carefully considered decision. A system of risk management contributes to understanding the risks facing NWO-I. Risk management is also mandatory on grounds of "good governance" and legislation.

Risk management is a continuous process in which we identify and analyze the risks that threaten the attainment of the organization's objectives. These risks are subsequently managed. Clear delineation of responsibilities and process setup is essential for good risk management. NWO-I follows NWO's risk management process. NWO is risk averse in its approach, because it primarily works with public funds; its risk appetite is therefore low. NWO uses a general framework for identifying, analyzing, controlling and monitoring risks (based on elements from COSO and ISO 3100). NWO-I's risk management takes place according to the cycle shown in Figure 4.2.1.

Figure 4.2.1 Risk management cycle at NWO-I



Maintaining and updating the risk register is part of the ongoing processes of the operations, the planning and control cycle and quarterly/budget reports at NWO-I:

- Risk management at the institute level:
 - the institutes each provide an internal risk management process;
 - the main risks are discussed in the semiannual meetings with the Foundation Board;
- Risk management at the level of NWO-I:
 - every year, consolidation takes place at the NWO-I level to systematically map the risks of the Foundation as a whole;

How have the risks identified for 2022 evolved?

The NWO-I 2021 financial annual report had mentioned a number of financial risks for 2022. The status of these risks is as follows:

- Digital intrusion at NWO-I; NWO-I has established an information security policy and tighter agreements on governance, responsibilities and roles regarding information security. An awareness campaign is being planned and tooling is being procured and implemented to support our quality assurance systems for information security and privacy.
- Insufficient resources to replace/update (major) infrastructure; no developments.
- Discrepancy between ambition and the knowledge and capacity it requires; The scarcity on the labor market is not to NWO-I's advantage. The availability of sufficient and appropriately qualified employees is crucial to achieving the desired results. In 2022, we therefore adjusted the policy and recruitment procedures accordingly.
- The effects of inflation, including rising energy costs at the institutes; NWO-I was compensated in 2022 for wage and prices increases and also received a compensation for increased energy prices.
- The situation in Ukraine. NWO-I received €1,035k from the Ukraine Emergency Fund to provide a workplace to researchers fleeing that country.

What are the generic/strategic risks?

The generic and strategic risks were evaluated at the end of 2022 and adjusted where necessary.

These strategic risks have been quantified based on classification in three categories: high, medium and low.

This classification forms the basis for reporting and managing the risks.

Price risk

NWO-I undertakes few commercial activities, so there is little price risk.

Credit risk

Accounts receivable include receivables from grantors and receivables from other debtors. The credit risk on these receivables is limited.

Interest rate risk and exchange rate risk

NWO-I incurs only limited interest rate risk on its debt, as cash flows are largely independent of market interest rates. The liquid assets are held at the government. NWO-I runs relatively little exchange rate risk because virtually all transactions take place in euros. The policy is not to use derivative financial instruments to manage (interim) interest rate fluctuations.

Liquidity risk

NWO-I uses treasury rules to manage liquidity risks. The fundamental principle of the treasury rules is that the NWO-I monies may not be invested or used as collateral. All liquid assets are held at the Ministry of Finance, with the exception of a specific bank account for SRON.

All the institutes' financial risks are reported by every organizational unit in the quarterly and budget reports to the Foundation Board. The rating of a risk (as High, Medium, Low) is partly determined by the likelihood of an event occurring, taking into account the expected effect (effectiveness) of a control measure. The rating is also

based on the quantitative (consequential damage) impact. The risks identified are laid down in a detailed risk register. The risks are discussed with the management of each institute every six months, along with the financial reporting and project portfolio. Of course, this will also include scientific developments and personnel developments.

What are the financial and other risks for 2023 and beyond?

In early 2022, NWO-I organized a workshop with the institutes and other internal stakeholders to identify the generic and strategic risks applicable to NWO-I and to determine the necessary control measures. A review of this took place at the end of 2022. In it, the risk of not being able to satisfy grant requirements was adjusted from "medium" to "high".

Table 4.2.2 Generic and Strategic Risks NWO-I

Risk	Consequence	Cause	Existing control measures	Risk category
Digital intrusion at NWO-I.	Disruption of operations and/or scientific research, damage compensation, threat to knowledge security, reputational damage.	Unsuitable, outdated security allowed unauthorized access to the IT infrastructure and information systems.	<ul style="list-style-type: none"> - Firewalls, antivirus software and spam filters. - Investigation into IT vulnerabilities Development: <ul style="list-style-type: none"> - Development in risk management and cyber policy. - Improvement of knowledge and awareness. - Strengthening of internal and external cooperation in relation to cybersecurity. - Increasing vigilance. - Strengthening of cyber-security expertise. 	High
Insufficient resources to maintain/replace/update (major) infrastructure.	Major impact on the scientific program.	Insufficient funding available (either from NWO-I or from external funding). Insufficient staff to be able to carry out operations.	The Board of NWO-I will investigate whether NWO-I funds can be made available for the co-financing of large scientific infrastructure, on which the NWO-I Board can decide itself, or other forms of earmarking NWO grants for institutes. In addition, they will establish criteria that investment requests (business case, including housing issues) must satisfy.	High
Discrepancy between ambition and the knowledge and capacity it demands.	The required competencies are not present in qualitative and quantitative terms. This can result in dissatisfaction, staff turnover and high workload and stress among employees. May result in NWO-I not achieving its strategic objectives.	NWO-I is unable to recruit and retain the right employees (technical, IT, engineering) ("war for talent").	Apply strategic personnel planning, the right incentives to retain employees, good training policy, and good fringe benefits.	High
Failure to satisfy grant conditions.	The grant awarded may be reduced, requiring the repayment of (part of) the grant.	Insufficient awareness of conditions and/or insufficient taking into account of conditions ass the project progresses.	Project controllers have been appointed at the institutes to monitor such matters. In the context of the Operations Development program, expertise is being strengthened and pooled.	High
Data breaches.	Reputational damage, potential damage to and breach of privacy of data subjects. Damage claims, and no longer being supplied with sensitive data for research.	Due to improperly secured IT: PCs, systems and servers. As a result of employees or persons associated with NWO-I knowingly or unknowingly providing, accessing, and/or deleting information without authorization.	Strengthening access security. Data breach process. Privacy, information security and knowledge security awareness campaign.	Medium
Undesired commitments with third parties or partners from high-risk countries and potential risks of financial setbacks arising from these commitments.	NWO-I and its institutes make (uncontrolled) long-term commitments, which could potentially result in financial setbacks or unwanted transfer of knowledge of national or strategic importance.	Misjudgment of undesirable business and/or scientific consequences of a long-term commitment, or poor awareness of potential risks and inadequate screening.	Directive on legal entities and the policy framework for holdings of institutes. Approval must be granted in advance to participate in (long-term) commitments. Awareness campaign on cooperation with high-risk countries. Proper screening of contracts and potential employees from high-risk countries, second-line advice from the National Knowledge Security Desk.	Medium
Hazardous substances or hazardous equipment (for instance, in measuring stations).	Accidents, reputational damage and financial consequences.	Careless handling of hazardous substances or equipment.	Procedures for ordering, managing, and disposing of the mentioned substances/procedures for the safe handling of hazardous equipment.	Medium

table continued on next page

Integrity breaches or violations of codes of conduct.	Reputational damage. NWO-I must answer to its users and its stakeholders for breaches of integrity. There may also be material or non-material damage to parties or persons involved.	Codes of integrity are not adhered to and/or no longer align with current cultural values in society.	NWO-I safeguards this risk via various codes of conduct for internal employees and for external individuals involved in work at NWO-I. Awareness will be raised through awareness campaigns in 2021/2022.	Medium
The portfolio of institutes does not provide sufficient national added value.	Support for the institutes erodes, making cooperation more difficult, and potentially resulting in less funding.	1) Institutes make the wrong strategic choices, or 2) institutes have insufficient resources to achieve their strategic goals, or 3) institutes are insufficiently connected to the national field.	1) Periodic evaluations of the scientific and strategic direction via scientific advisory councils, IAR, SEP cycle and PCNI. 2) In the P&C cycle with the institutes, the right match between annual plans, strategic plan and budget is aimed for. 3) The P&C cycle and SEP cycle focus on strengthening the national role and connection.	Low
Unlawful and inefficient procurement/ expenditures.	Noncompliance with applicable laws and regulations.	Procurement knowledge at NWO-I is limited, leaving employees unaware of the obligations under the Public Procurement Act.	Procurement policies and procedures. Verifying the lawfulness of invoices.	Low
Failure to fulfill (delivery) obligations.	Penalties/reputational damage.	Project delays or cancellations.	Making proper arrangements in advance and assessing risks.	Low
Fire/intrusion.	Digital and/or physical data and goods/stock are lost as a result of fire/intrusion.	Fire can be caused by an internal or external event.	NWO-I has taken out several insurance policies, including fire insurance. Encrypted storage of the sensitive data at a site >25km from the institute's location.	Low

Based on recent developments after the balance sheet date, risks related to the following will be taken into account as well:

- EU projects, failure to satisfy grant conditions. Due to an outcome of a recent audit, this risk has been increased from "medium" to "high".

4.3 Multi-year budget

The NWO-I Foundation Board adopted the 2023-2027 consolidated multi-year budget on October 5, 2022 and presented it to the NWO Executive Board. This budget contains the income, expenses and net result. The appropriation of the net result is indicated as well. The budget was based on NWO's multi-year outlook for NWO-I as known at the time and on the applicable principles.

4.3.1 Financial outlook

The basic grant of the institutes is funded by NWO and includes components with a specific lead time in addition to structural components. The basic grant is expected to maintain its stable character in the coming years. In addition to the basic grant, the institutes successfully acquire project funds from NWO, the European Union, the Dutch government and from collaborative projects with universities and the business sector. The institutes expect to keep their project portfolio at the same level in the coming years.

The income for 2023 is budgeted at €211,103k. In the 2023 budget, NWO-I assumes grants and contracts that have already been secured. Additionally, estimates were made of the benefits NWO-I will acquire for new programs and projects. In general, this reduces the income in the longer term because some caution is applied in the process. The income also decreases in the multi-year outlook due to the planned expiration of projects awarded under the former granting function of FOM (BUW).

The multi-year budget includes new resources for funding the Office, the wage, price and energy compensation, the funds to cover SRON's structurally increased WOZ charges, the funds for SRON's FIR programs, the NWO-I development fund, the Ukraine emergency fund, the OCW funds for the Netherlands' increased contribution to SKAO, the expiration of the SEO scheme.

4.3.2 Budgeted income and expenditure

The following shows how income and expenditure are expected to develop over the next five years. NWO-I secured several funds to deal with the effects of the coronavirus crisis. (Table 4.3.1).

Table 4.3.1 Statement of income and expenditure

(amounts x €1,000)	Approved budget 2022	Realization 2022	Budget 2023	Budget 2024	Budget 2025	Budget 2026	Budget 2027
	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000
Income							
3.1 State contributions	145,409	154,683	133,967	129,746	129,807	129,841	129,537
3.2 Other government contributions and grants	1,379	682	100	100	-	-	-
3.4 Income from work for third parties	66,558	73,226	71,030	68,538	65,692	65,310	64,612
3.5 Other income	6,674	14,403	6,006	6,327	6,513	6,720	6,870
Total income	220,020	242,994	211,103	204,711	202,012	201,871	201,019
Expenses							
4.1 Personnel expenses	134,541	139,643	142,495	136,672	135,171	133,440	130,283
4.2 Depreciation/amortization	9,610	8,497	10,985	10,879	13,917	13,182	13,132
4.3 Housing expenses	13,597	11,876	16,394	17,304	16,210	16,601	16,711
4.4 Other expenses	65,983	61,064	53,200	50,313	43,499	45,063	47,437
Total expenses	223,731	221,083	223,074	215,168	208,797	208,286	207,563
Balance of income and expenditure	-3,711	21,910	-11,971	-10,457	-6,785	-6,415	-6,544
5 Realized revaluation	-	-	-	-	-	-	-
6 Financial income and expenditure	-3	1,433	-	-	-	-	-
7 Taxes	-	-	-	-	-	-	-
8 Result from participating interests	-	372	-	-	-	-	-
Result after taxes	-3,714	23,715	-11,971	-10,457	-6,785	-6,415	-6,544
9 Third-party share in result	-	-	-	-	-	-	-
Total net result	-3,714	23,715	-11,971	-10,457	-6,785	-6,415	-6,544

NWO-I budgets a negative result for the coming years. This is mainly due to the planned use of accumulated reserves and the conservative estimate of (project) revenues.

- The main reasons for decreasing income in the period 2023-2027 (-€10,084k) are related to (incidental) components in the government contribution (-€4,438k), components in the Other government contributions and grants (€100k) and components in Income from work for third parties (-€6,419k). Other income actually increases during this period (€864k).
- The item Income from work for third parties includes:
 - o specific project grants such as NWO major and the Innovation Impulse (Venis, Vidis, Vicis) implemented by the institutes;
 - o income on account of projects funded by the European Union from the framework programs and by the European Research Council (ERC);
 - o income from companies from PPP projects and contract research at the institutes.
- Expenses decrease by €15,511k over the period 2023-2027 due to declining personnel costs, as staffing levels decrease over time and vacancies are not budgeted everywhere, increasing depreciation costs due to investments in new construction and renovation, and decreasing other costs due to incidental components, such as the contribution to SKAO and the expiration of programs and projects in the BUW.

- The negative result of (-€11,971k) in 2023 is mainly caused by the earmarked reserves being caught up, for example because of the conclusion of the BUW activities.

All the NWO institutes secure funding in addition to the basic grant allocated by NWO from the State contribution. The motivation and approach depend on the mission and context of the institute and therefore vary from institute to institute. This also applies to the volume of grants and contracts that are yet to be acquired, recorded for each institute.

Granting activities after merger settled no later than 2024

On January 1, 2017, the foundation for Fundamental Research on Matter (FOM) was transformed into NWO-I. In the process, the granting activities of the former FOM were transferred to NWO's Exact and Natural Sciences (ENW) domain. NWO-I settles awards made by FOM before January 1, 2017. This allows the institutes and the BUW to conclude ongoing programs and projects. The last program is expected to be concluded in 2024. In 2022, the total amount of granting obligations decreased from €3,458k to €36k.

Table 4.3.2 Granting obligation

Granting obligation NWO-I (amounts x €1,000)	12-31-2021	Movement 2022	12-31-2022
Of which to be financed at the expense of future NWO budgets	3,458	-3,422	36
Total granting obligation NWO-I	3,458	-3,422	36

Organizational units (amounts x €1,000)	12-31-2021	Movement 2022	12-31-2022
Nikhef	436	-436	-
BUW	3,056	-3,056	-
GENERAL	-34	70	36
Total NWO-I	3,458	-3,422	36

4.3.3 Investment plans and circumstances affecting the budget

4.3.3.1 Nikhef renovation

The Nikhef renovation cost a total of €39,000k. To cover this, Nikhef receives a basic grant of €26,000k in the form of €1,300k per year in the period 2019 through 2038. Nikhef will supplement €13,000k itself with funds from the basic funding (€6,000k, in the period 2017 - 2026) and from data center operations (€7,000k, in the period 2019 - 2028).

4.3.3.2 Expiration of the BUW

Research activities within the BUW were granted under the former granting function of the FOM foundation. The size of the BUW 46 is decreasing as a result of its phasing out. The workforce decreased from an average of 116 FTE in 2021 to an average of 54 FTE in 2022. The BUW projects are expected to have ended by 2024.

4.3.3.3 Effects of the Coronavirus crisis

NWO-I received various resources to deal with the impact of the COVID-19 pandemic. NWO provided a budget of €6,000k from the state contribution and provided a budget of €815k from the NWA funds to compensate for research delayed by COVID-19. OCW offered a budget of €4,756k from the NPO administrative agreement, the support program for researcher recovery and prospects.

The Foundation Board decided to accommodate these various contributions in a Coronavirus Fund in order to fund various types of expenses. It is NWO-I's objective to take stock in 2023 and compensate the institutes appropriately for the additional costs caused by the coronavirus.

4.3.4 Continuity section

The multi-year outlook regarding NWO's basic grant to NWO-I is outlined annually in NWO's Framework Letter. NWO-I's budget is drawn up based on the figures in the framework letter and on the project awards and contracts that have already been secured. The budget also includes an estimate of grants and contracts yet to be secured. The multi-year budget of income and expenditure can be found in Section 4.2.2. and Chapter 8 contains the Notes on the statement of income and expenditure in the financial statements.

NWO-I's 2023 budget includes an overview of the movement in NWO-I's equity. Equity will decrease in the coming years as a result of the expiration of projects honored prior to 2017 in the context of FOM's granting function and as a result of the utilization of allocated reserves at the institutes. In addition, various major investment projects, such as the replacement of the NIOZ fleet, the construction of the new SRON building, and the renovation of Nikhef, will impact the development of the foundation's assets. Consequences are also expected for 2023 and beyond for the implementation of projects that were delayed due to the Coronavirus crisis. The latter effects were not taken into account in the Equity and liquidity tables below.

Table 4.3.3 Equity

(amounts x €1,000)	12-31-2022	2022 budget	2023 budget	2024 budget	2025 budget	2026 budget	2027 budget
Equity	115,558	78,345	97,847	87,390	80,605	74,191	67,647

Liquidity

The budgeted decrease in equity also bears implications for the projected position of the liquid assets. Liquid assets are decreasing due to large capital expenditures in 2022 and subsequent years. Because there could be negative liquidity from 2023 onward, a loan has been agreed with NWO to finance major capital expenditures totaling €120,000k. This can accommodate the anticipated deficit. This loan was formalized in 2022 and included in the figures.

Table 4.3.4 Liquidity

(Amounts x €1,000)	2022	2022 budget	2023 budget	2024 budget	2025 budget	2026 budget	2027 budget
Starting balance		75,006	56,484	51,319	51,477	66,451	65,137
Revenues		224,222	213,236	202,853	201,923	201,826	200,944
Expenditure		247,895	218,401	202,695	186,949	203,140	202,813
Final balance according to balance sheet	81,810	51,333	51,319	51,477	66,451	65,137	63,268

The balance sheet budget provides insight into the expected positions of the different balance sheet items in a multi-year perspective. The budgeted balance sheet total will fluctuate in the coming years compared to the position at the end of 2022. The balance sheet total will increase through the end of 2025, mainly due to the capitalization of various large capital expenditures for the fleet renovation, new SRON building and renovation

of Nikhef. In subsequent years, the balance sheet total will decrease again due to the impact of the depreciation of tangible fixed assets.

The fixed assets increase substantially as a result of investments made. Equity is decreasing as planned, in part because arrears in research are being cleared and the BUW's earmarked reserve is decreasing. Because of a lack of sufficient insight into the future, income from work for third parties has been budgeted conservatively, which results in a declining trend.

Section 4.3.1. shows the projected development of income and expenditure through 2027. The budgeted expenses are higher than the income, which yields negative results. This occurs, for instance, when income and/or expenses are not budgeted in the same year, as is the case for income for capital expenditure and the related depreciation expenses. Negative results covered by reserves do not pose a problem.

Events after balance sheet date

There were no events after the balance sheet date with significant financial impact on the 2022 figures.

Balance sheet

Table 4.3.5 Balance sheet

Balance sheet (Amounts x €1,000)	12-31-2022	2022 budget	2023 budget	2024 budget	2025 budget	2026 budget	2027 budget
Intangible fixed assets	3,243	3,365	3,256	2,442	1,628	814	0
Tangible fixed assets	184,636	208,241	206,298	248,031	246,833	233,243	220,288
Financial fixed assets	2,332	1,782	1,515	1,476	1,437	1,398	1,363
Fixed assets	190,211	213,388	211,069	251,949	249,898	235,455	221,651
Receivables	43,235	34,310	29,686	31,557	31,677	31,736	31,846
Liquid assets	81,810	51,333	51,319	51,477	66,451	65,137	63,268
Current assets	125,045	85,643	81,005	83,034	98,128	96,873	95,114
Assets	315,256	299,031	292,074	334,983	348,026	332,328	316,765
General reserve	7,816	721	7,103	6,703	6,403	6,253	6,153
Earmarked reserve	103,312	73,472	86,296	77,053	71,382	65,932	60,302
Earmarked fund	1,187	797	1,192	1,192	1,192	1,192	1,192
Other legal reserves	3,243	3,355	3,256	2,442	1,628	814	0
Equity	115,558	78,345	97,847	87,390	80,605	74,191	67,647
Provisions	9,472	11,065	10,085	9,808	9,631	9,487	9,417
Long-term liabilities	74,235	103,515	93,665	145,879	170,069	161,526	153,039
Current liabilities	115,991	106,106	90,477	91,906	87,721	87,124	86,662
Liabilities	315,256	299,031	292,074	334,983	348,026	332,328	316,765

Please refer to 4.1.1 Developments in the financial position and Chapter 7 Notes on the balance sheet in the financial statements for further explanation of the balance sheet.

The foundation's workforce will decrease in the coming years as a result of the expiration of the granting function. The future project portfolio has been conservatively estimated. The ratio of permanent appointments to temporary appointments has shifted towards more permanent appointments, again, primarily due to the expiration of the granting function where traditionally more temporary appointments would occur.

Table 4.3.6 FTEs

(Average number of employees FTE)	2022	budget 2022	budget 2023	budget 2024	budget 2025	budget 2026	budget 2027
Permanent appointment	804	870	813	807	799	794	795
Temporary appointment	810	737	744	762	753	758	752
Total	1,614	1,607	1,557	1,569	1,552	1,552	1,547
Personnel							
(Average number of employees FTE)							
Executive Board/Management	19	20	20	20	20	20	20
Personnel in primary process/scientific positions	888	965	909	926	908	908	861
Support staff/other employees	707	622	628	623	624	624	666
Total	1,614	1,607	1,557	1,569	1,552	1,552	1,547

The above breakdown of personnel is based on the Dutch Accounting Standards published by the Dutch Accounting Standards Board, broken down into Executive Board/Management of NWO-I, being the directors and institute managers (on average 2 FTE per institute); the personnel for the primary process (all scientific functions) and the support and other staff (such as technicians, ICT, facilities and the like, personnel and financial employees).

B1. Reporting on presence and operation of the internal risk management and control system.

Reference is made to Chapter 7.6 Horizontal Accountability and in particular Section 7.6.1 Internal Management and Control System and Section 7.6.2 Internal Audit.

B2. Description of key risks and uncertainties

Please refer to Section 4.2 Description of key risks and uncertainties.

B3. Supervisory body reporting

Reference is made to Section 7.2.2. and Section 7.6.3 Supervisory Board, where a brief report is given by the Supervisory Board, the supervisory body of NWO-I.

Continuity

NWO-I has implemented various measures already, to ensure the continuity of activities, for example by closely monitoring developments in the coronavirus outbreak and taking additional measures where necessary. Measures are also taken by project control to mitigate the risks of not being able to satisfy grant conditions.

Other aspects related to continuity are addressed elsewhere in the report: see, for instance, the description of risks and uncertainties above and internal control and supervision in Chapter 7.

5 Personnel

This chapter describes the most important personnel developments in 2022.

5.1 Vision of human resources policy

The nine institutes that make up NWO-I are, each in their own field, initiators and implementers of scientific research, centers of expertise, incubators for scientific innovation, breeding grounds for talent, and both national and international connectors between science and application. To fulfill these roles, NWO-I needs talented people who feel connected to our responsible mission and societal ambition. NWO-I aims to be an inclusive employer to motivated employees who energetically and enthusiastically utilize and develop their talents in science, technology or business management. This requires a strategic HRM framework to provide direction to NWO-I's human resources policy and ensure the use of appropriate tools while taking into account the specific context of each institute. In 2022, a strategic framework was formulated for the period 2022-2026. The framework focuses on the themes of labor market, leadership, vitality, performance, learning & development, and inclusivity. Partly as a starting point for policy development on these topics, an employee survey was prepared that will map out how employees perceive the situation around these topics in 2023.

Labor market

It is critical for the institutes to be seen as and considered attractive employers. For the vast majority of positions, that attraction lies primarily in the substantive challenge of the research work. For this reason, every institute and the agency handle recruitment and onboarding on their own. The name recognition of the institutes and their intense cooperation with universities are both great contributing factors to the influx of young scientists. In relation to the filling of more senior positions, we increasingly see the importance of facilitating settlement in the Netherlands, including finding housing and employment for the partner. NWO-I strives for a diverse composition of its workforce and emphatically positions itself in the labor market with this invitation.

Inclusion and retention, recognition and appreciation

The quality of the work that NWO-I brings to fruition depends on the diverse talents that our employees bring to the table and the freedom they perceive to do what they are good at or want to become good at. The institutes of NWO-I want to radiate and live up to the promise that every person with an appropriate qualification is welcome to make a lasting contribution. Diversity reinforces the strength of the team, where everyone must be able to feel at home and safe. More and more, we highlight how different personalities, qualities and skills are recognized, deployed, acknowledged and valued. Being a good employer means aiming to create a lasting connection. Challenging development opportunities, social safety, flexible preconditions and good working conditions are important pillars in this regard.

NWO-I took additional initiatives to be an interesting and safe employer for various target groups: we explicitly recruit women for technical and scientific positions, a Diversity and Inclusion adviser was hired, and NWO participates in Workplace Pride activities.

The policy topic of Recognition & Appreciation has taken substantive shape in 2022, both in Dutch academia and internationally. So too within NWO. In close conversation with broad representation from the organization, a vision was developed and detailed in a comprehensive action list. Implementation is slated for 2023.

5.2 Developments

NWO-I is the employer of the employees of the institutes, the NWO-I Office and the employees in the University Working Groups Administrative Unit (BUW).

5.2.1 Personnel employed

The table below shows how many FTE (rounded) NWO-I employed for different categories of employees. The male/female ratios were included as well. NWO-I has set a goal of increasing the percentage of women in scientific positions in particular, and is actively working towards this objective (as outlined in Chapter 3, Diversity and Inclusion). Despite many efforts, we did not succeed in further increasing the proportion of women in the organization in 2022.

Type of personnel		12-31-2021				12-31-2022				Difference	
		FTE	people	% M	% F	FTE	people	% M	% F	FTE	people
Scientific	PhD students	394	398	63%	37%	359	361	61%	39%	-35	-37
	Researchers on temporary contracts (including postdocs)	281	302	65%	35%	252	268	65%	35%	-29	-34
	Researchers on permanent contracts	262	286	82%	18%	269	292	82%	18%	+7	6
Non-scientific	In temporary employment	116	135	71%	29%	127	149	73%	27%	+11	14
	In permanent employment	609	665	71%	30%	591	647	71%	29%	-18	-18
Total headcount		1662	1786	70%	30%	1598	1717	70%	30%	-64	-69

As of December 31, 2022, the scientific payroll counted a (rounded) total of 880 FTEs (611 of which were temporary and 269 permanent) and other personnel accounted for a (rounded) total of 718 FTEs, including technicians, IT workers, facilities workers and financial staff (127 temporary and 591 permanent). The number of researchers on permanent contracts increased. Among non-scientific staff, there has been slightly more outflow. The number of interim workers and temporary contracts has increased as a result. The total size of the workforce contracted by 4% in 2022. The decrease in the number of scientists in temporary positions compared to 2021 is largely due to the phasing out of the BUW. The group of people working within the institutes also includes a large number of guests. They are not employed by NWO-I, but do use the infrastructure available there to do (some of) their research work. Particularly in the mentoring of scientists in training, we also see the contribution that institutes make to the training of new generations. The composition of the group is (rounded) as follows:

Trainee researcher	177
Researcher	125
Scientific project leader	5
Associate professor	37
Professor	19
Number of guests as of December 31, 2022	363

Management as of December 31, 2022

As of December 31, 2022, NWO-I management consisted of 9 institute directors, 8 institute managers in addition to a vacant position, and the NWO-I Director of Operations.

5.2.2 Sickness absence

After a decrease in 2021, the absenteeism rate (excl. pregnancy) at NWO-I increased again during the calendar year. The average duration of sickness absence cases that ended in the year under review was more or less constant. Considerable variation exists among the different organizational units. The NWO-I-wide average of 2.7% is still well below nationwide figures: the 2022 average in the Dutch labor market as a whole was approximately 6%; in the Education and Government sectors, figures vary between 4.5 and 6%.

Location	Sickness absence rate				Average duration (days)	
	2020	2021	2022	Average	2021	2022
AMOLF	2.32%	2.68%	3.9%	2.97%	11.3	10.5
ARCNL	1.31%	1.02%	1.3%	1.20%	4.5	3.0
Astron	4.10%	3.77%	4.5%	4.12%	16.9	15.7
NWO-I Office	7.04%	6.24%	8.1%	7.14%	33.0	16.4
BUW**	1.36%	0.50%	0.3%	0.73%	25.9	4.9
CWI	1.09%	1.11%	3.0%	1.75%	17.0	17.8
DIFFER	3.75%	2.36%	4.6%	3.57%	17.5	11.2
Dubble	0.68%	0.00%	0.00%	0.23%	0.0	0.0
Jive	2.08%	0.17%	1.24%	1.16%	15.0	6.5
Nikhef	1.90%	0.86%	1.9%	1.88%	9.1	6.5
NIOZ*	2.60%	2.40%	3.2%	2.73%	6.3	6.3
NSCR	2.45%	2.73%	3.8%	2.99%	26.6	13.8
SRON	2.66%	2.05%	4.1%	2.92%	15.9	14.1
Total NWO-I*	2.01%	1.62%	2.72%	2.12%	16.1	12.6

* The data from NIOZ was supplied based on a deviating method of calculation. These figures are not included in the total counts.

**With regard to sickness absence in the BUW, it should be noted that there is evidence that not every report of short-term absence of NWO-I employees is recorded.

5.2.3 Policy regarding junior researchers

PhD students

PhD students are employees who conduct scientific research via a learning trajectory that culminates in a doctoral thesis and a doctoral degree, the recognition as an independent scientific researcher. The primary and principal requirement for conducting scientific research is substantive knowledge in the PhD student's own research field.

The substantive development of the PhD student requires much more than substantive scientific knowledge. Being a fully-fledged Doctor of Science with good job prospects requires "soft skills" in addition to subject area knowledge and research skills.

Organizational units (institutes and the BUW) determine which training courses (in terms of content and provider) they organize for their PhD students in addition to internal training and "hard skills" training.

Starting in 2020, NWO-I will offer a centrally organized "PhD training program", which includes the joint procurement and organization of four training courses: Taking charge of your PhD project, The art of presenting science, The art of scientific writing and Career orientation. A course in Scientific Integrity was added for this group, as well as for other NWO-I employees in 2021.

Implemented work-to-work policy

Most of the influx into benefits arises from the expiration of the employment contracts of PhD students. We pursue an active policy to help young researchers move from work to work after their temporary

employment ends. To assist PhD students in their job search immediately after NWO-I, we offer the opportunity to enroll in individual basic training courses on career planning. During their employment, the PhD students are invited to undertake skills training in order to increase their chances of finding subsequent employment.

NWO-I has also concluded an agreement with an external service provider who carries out the reintegration obligations on behalf of NWO-I, which we bear as self-insurer, if the candidate is expected to encounter difficulty in finding a new job. The agency advises on the use of so-called reintegration tools (training, trial placement, etc.) and, if necessary, checks whether the ex-employee satisfies the obligations imposed by the Unemployment Insurance Act.

NWO-I is self-insured for the Unemployment Insurance Act, which means that the costs are borne by NWO-I. The implementation of the Unemployment Insurance Act is performed by the UWV.

5.3 CLA and IR

Collective labor agreement

Employers KB, NWO and NWO-I, united in the WVOI, and employee organizations FNV, CNV Education and AOb reached an agreement on July 21, 2022 for a new collective labor agreement for Research Institutions.

The key agreements were mainly of a financial nature, prompted by nationwide inflation. Salary scale amounts were structurally increased by 4% effective August 1, 2022. In addition, each employee who was employed on August 1, 2022 received a one-off benefit of 1,050 euros gross, with this benefit being calculated in proportion to the employee's employment percentage (full or part time) and the number of months the employee was employed during the period between January 1 and July 31, 2022.

Salary scale amounts were structurally increased by another 2% effective January 1, 2023.

As of August 1, 2022, all working parents are entitled to nine weeks of paid parental leave based on the new Paid Parental Leave Act (Wbo). That law provides that any working parent is entitled to nine weeks of paid parental leave at 70% of the UWV daily rate before the child's first birthday.

The CLA for Research Institutions already had a scheme for paid parental leave. This scheme will be adjusted and improved based on the new law. Starting August 1, employees can take 13 weeks of paid parental leave at 55% of their salary as long as this leave is taken before the child's fourth birthday. This percentage is increased to 70% if employees take these weeks before the child's first birthday. Any remaining hours of the 13 paid weeks can be claimed at 55% of the salary after the child's first birthday, as long as these hours are claimed before the child's fourth birthday.

The CLA was concluded for 1.5 years and runs from January 1, 2022 to June 30, 2023.

IR

The initial start date for the new commuting expense scheme was July 1, 2020. As a result of the coronavirus measures and the resulting sharp decrease in travel movements, it was decided, together with the employee representatives, to largely postpone the introduction of the commuting expense scheme. The old scheme remained in place, with only the 100% reimbursement of public transport commuting expenses from the new scheme being introduced. On July 1, 2022, the new scheme was introduced.

Agreement was reached with the Central Works Council to reimburse expenses incurred when working from home, even after the period when government measures related to the coronavirus pandemic forced us to work from home. This resulted in a Hybrid working policy which is included in the UVR as a new implementing regulation. Hybrid working implies that employees can perform their work at different places. The essence of

the Hybrid working policy is that the employer should allow employees to work optimally, at the time and place that is most convenient and in the best interest of the organization and the employee. How this is done depends in part on the nature of the work. For some activities (such as policy work), the need to carry them out at a specific location is limited. For other activities (such as laboratory work), the possibilities of working elsewhere are limited. Whether working from home is an option will follow from the Hybrid working policy. If the employee works from home, agreements have been made with the Central Works Council for the facilitation and/or reimbursement of home office furniture.

5.4 Policy in response to the coronavirus

The global outbreak of the coronavirus and government measures to mitigate it had a major impact on the work at NWO-I during the first months of 2022 as well. As of mid-March, the government lifted most measures and work could reasonably resume as usual. The institutes and the Office have mostly taken a phased approach to getting their employees accustomed to working on-site again and finding a new balance with working from home. During 2022, the impact of the coronavirus increasingly abated and equilibrium was restored. It is clear that more than two periods of coronavirus restrictions have left an impact on the organization, as there is less travel, more conferences are attended online and hybrid working appears to be a new reality.

Renewals from the Coronavirus Fund

Shortly after the outbreak of the pandemic in 2020, the Foundation Board of NWO-I set up a coronavirus fund to enable the institutes to do what was necessary to minimize the effects of the coronavirus measures as much as possible. NWO's Executive Board assigned €6 million to this end. The fund was later expanded with resources from e.g. the National Education Plan (NPO), which were awarded to NWO-I through NWO. In the Coronavirus Fund, special attention is devoted to the impact that restrictions have (had) on the careers of young researchers. The funds from the NPO are specifically intended for this group. Agreements on how the funds will be spent are laid down in the NPO administrative agreement. In October 2021, the Group Works Council approved the procedure for spending and allocating resources from this fund.

The Coronavirus Fund also provides scope for financial compensation for the expenses of permanent (technical) personnel who could not be productive during lockdown situations, which meant that delivery deadlines could not be met or other additional costs had to be incurred.

In the table below, we report on the contract renewals of temporary personnel, broken down by PhD students and postdocs, funded from NPO resources in 2022.

2022 Institutes	number of people	number of months	gross salary costs €	overhead €	Total costs €
PhD students	38	158	769,270.46	384,635.23	1,153,905.69
postdocs	19	82	472,230.91	236,115.46	708,346.37
total	57	240	1,241,501.37	620,750.69	1,862,252.06

* Overhead was calculated using the salary costs plus fixed surcharge system as used by RVO, see

<https://www.rvo.nl/subsidies-regelingen/subsidiespelregels/subsidiabele-kosten/loonkosten-plus-vaste-opslag-systematiek>.

This means that an additional 50% of gross salary costs have been classified as overhead.

The table above shows the number of temporary researchers whose contracts were renewed with funding from the Coronavirus Fund. Most of these researchers work at the institutes, but of the 100 or so temporary researchers working at the universities (University Working Groups Administrative Unit, BUW), 26 people in total received 111 months of contract renewal from the Coronavirus Fund in 2022. The overhead costs in the table give an indication of the costs incurred that are not covered by the Coronavirus Fund.

6 Housing, sustainability and occupational health and safety

This chapter sheds light on the key developments in real estate and housing, sustainability and occupational health and safety.

6.1 Real estate and housing

6.1.1 Nikhef renovation

In 2021, the renovation of Nikhef's building at the Amsterdam Science Park was kicked off. The renovation consists of structural and technical modifications to prepare the building for Nikhef's operations. The look and feel will be more modern and the building will be made more sustainable. The redesigned layout will foster collaboration and informal meetings in a central location, preserving a tranquil environment in the other workspaces. Ultimately, a beautiful and future-proof building will be created that students, technicians and scientists will enjoy for at least 20 years to come.

Different parts of the building will be tackled in five construction phases, and the building will remain in use during the renovation. The construction work will be performed by Spie (after it acquired Strukton Worksphere in early 2022). Two phases have now been completed. Due to the coronavirus situation and material shortages associated with the Ukraine war, final completion has been delayed by about six months with respect to the original schedule and is now anticipated shortly before summer 2023.

The Nikhef building is part of a complex, which also includes NWO institute CWI and others. The basic design for the changes to the facade throughout the complex was created by BDG Architects. The design team for the Nikhef section was comprised of JHK Architecten, Deerns and Aronsohn Constructies. Construction supervision is in the hands of the Brink Group.

6.1.2 New SRON building in Leiden and sale of SRON building in Utrecht

A new building for SRON was completed at Leiden University campus in 2021. The relocation from Utrecht to Leiden was based on a new collaboration between Leiden University, TU Delft, several other knowledge partners and SRON, focused on SRON's main research programs: astrophysics, exoplanet research, Earth-centered research and technology development. SRON's branch office in Groningen is located in the building complex of the University of Groningen's Faculty of W&N, and is expected to move along with that faculty to a new-build premises in 2024.

The new building in Leiden is in full operation. The new accommodation fully meets the expectations of SRON and its staff, and has led to a new fruitful collaboration with partners in Zuid-Holland. SRON now has world-class facilities. For the development of new detection techniques for satellites and the large precision satellite instruments that SRON is building, the clean room has a low-vibration floor. Five thousand cubic meters of concrete, eight hundred tonnes of reinforcement and three hundred bored piles provide enough mass and stability to keep out virtually any vibration. In addition to the aforementioned clean room, the building features laboratories, technical areas with crane tracks, a characteristic atrium, grandstand stairs and an eye-catching facade. The building was designed to meet the standard of the BREEAM Excellent sustainability label. The project was realized within the comprehensive budgetary framework for construction and relocation.

The move to Leiden meant that SRON's building in Utrecht was no longer needed in 2021. In 2022, the building was sold to Utrecht University and NWO-I also relinquished the ground lease of the land as part of that process. The transfer was completed in 2022 and the proceeds are reflected in the 2022 financial statements.

6.1.3 WCW boiler house

In 2020, the Foundation Board decided to sustainably renovate the so-called WCW boiler house in conjunction with the Nikhef renovation as well. WCW stands for "Wetenschappelijk Centrum Watergraafsmeer" [Watergraafsmeer Scientific Center]. The proposed solution is a thermal storage ring system involving heat and cold being stored and extracted from wells in the ground. NWO Institute CWI and Nikhef both use the WCW boiler house, a name that commemorates the old and unsustainable way of generating energy that is now being replaced by a state-of-the-art facility, also in line with the sustainability ambitions of NWO and NWO-I.

Project implementation began in 2020. A temporary cooling facility was installed in 2021 to solve urgent cooling needs. After a tender, construction of the new facilities started in 2022. The completion is scheduled for mid-2023, at roughly the same time as the completion of Nikhef's renovation.

6.1.4 Maintenance plan and maintenance fund

NWO's institutes are scattered throughout the Netherlands. In total, NWO-I has approximately 28,500 m² of laboratories and 40,000 m² of work spaces in offices. The institutes traditionally took care of the maintenance of the buildings themselves, in part using their own funds and in part with funds provided by NWO on an ad-hoc basis. On the basis of a thorough analysis, it has been determined that maintenance can be organized more efficiently in joint cooperation, but also that there are structurally inadequate resources for systematic maintenance in accordance with the requirements of the research and the research facilities. In 2022, this led to a NWO-I-wide maintenance policy and the establishment of a maintenance fund. The maintenance fund includes over €5m, composed of resources transferred from the institutes' budgets and a supplementary structural allocation of €3m from NWO-I.

Starting in 2022, a multi-year maintenance plan will be implemented and updated annually as part of the planning and control cycle. The 2023 budget incorporates the figures of the maintenance plan for the first time. Major investment decisions about new construction or renovation are so intertwined with the scientific strategic agenda of institutes and decisions about infrastructure and facilities that they are made within that framework. The financial framework of the maintenance fund does not allow for this either. The annual adjustment of the maintenance plan and the management of the maintenance fund are done by the real estate department of the NWO-I office, in close cooperation with the responsible units within the institutes.

The next step is the realization of a Strategic Real Estate Plan (SVP). NWO's Executive Board already adopted a number of strategic principles for this in 2018. These will be further developed in steps in 2023 and 2024.

6.2 Sustainability

Sustainability, environment and climate are high priorities at NWO-I. We strive to work paperless, use as little plastic as possible, make our buildings as carbon-neutral as possible and encourage our employees to travel by public transport.

In 2020, the firm Arcadis conducted an analysis of the climate impact of NWO-I and possible measures to mitigate it. The results were used to further develop sustainability policies for each institute individually. To this end, every institute was screened in detail and the most important sources of environmental impact were identified. Over the course of 2021, we looked at what measures could be taken at each institute on this basis, in order to reduce the impact on the environment or achieve carbon offsetting. This was continued in 2022.

6.3 Occupational health and safety

NWO-I will issue a separate internal occupational health and safety annual report for 2022. In this report, we limit ourselves to the most important events and the occupational health and safety policy of NWO-I, which pursues the following goals:

- To optimize the safety and protection of the health of all employees, guests, interns and visitors;
- To ensure optimal health and safety when handling installations, equipment, machinery and goods;
- To prevent psychosocial work stress caused by excessive workload, bullying, sexual harassment, aggression and violence.

Working conditions

A variety of issues were taken up by NWO-I's joint health and safety coordinators in 2022. Two new health and safety coordinators also started in 2022. The framework policy on intense light sources drafted with the Laser Safety Officers of the NWO institutes was adopted. This is part of securing safe working with intense light sources. Lasers are covered by this policy as well.

In view of observing due care for employees with a desire to have children, pregnant employees and employees who are breastfeeding, the policy on Starting a Family (m/f), Pregnancy and Lactation has been updated. Nanomaterials are now explicitly included under "working with hazardous substances". Various policy issues on psychosocial workload were addressed together with human resources.

Finally, in view of cooperation and professionalization, the occupational health and safety coordinators underwent training in conducting accident investigations.

Accidents and incidents

No major incidents occurred at NWO-I in 2022. However, there was one incident from which an employee has not yet fully recovered, due to an unfortunate confluence of circumstances.

Dynamic Risk Inventory and Evaluation

After the successful pilot of the Dynamic Risk Inventory and Evaluation (D-RI&E) at ARCNL in working conditions, an additional effect of reduced downtime of setups due to preventive maintenance was realized. A start was made on using the D-RI&E at AMOLF and Nikhef.

The Dutch Labor Inspectorate visited ARCNL as part of their annual survey regarding the state of working conditions in the Netherlands. They see the use of the D-RI&E as a favorable development.

D-RI&E workshop at NVVK conference

Nikhef's occupational health and safety adviser gave a workshop on implementing the D-RI&E at the national conference of the Dutch Society for Safety Science.

Accessibility of NWO-I's websites

Millions of Dutch people have one or more disabilities. Consider people with impaired vision, the deaf, the hard of hearing, those with physical or motor limitations or dyslexia. The government has therefore included in a law that everyone must be able to properly use the websites of public institutions such as NWO-I and the NWO institutes. This is also referred to as being "digitally accessible". The NWO institutes and NWO-I Office began to make www.nwo-i.nl and the institute websites "digitally accessible" in 2022: adapting documents, images, sound, technology and design, so they can be opened, listened to and viewed without barriers.

7 Organization and governance

The Foundation for Dutch Scientific Research Institutes (NWO-I) arose, in its current form, from a merger of foundations with one or more institutes that were affiliated with the Dutch Research Council (NWO) in various ways. From 2018 onwards, a clear distinction can be made between the awarding of grants for research and the conduct of research. NWO concentrates on the awarding of grants, NWO-I concentrates on the conduct of research. This research is conducted at the institutes of NWO-I.

After an evaluation of NWO-I's governance model in 2019, a new organizational model was implemented as of October 1, 2020, with one director with final responsibility at NWO-I. The departure of the NWO-I director before summer 2021 prompted a reevaluation of the new governance model. The NWO Executive Board decided to seek external advice on this matter. Consulting firm Phyleon presented an analysis to the Executive Board at the end of December 2021, which analyzed the vulnerabilities of the current model and identified opportunities for improvement. In 2022, discussions based on this analysis about possible changes continued, but have not yet led to a decision to change. The discussion will continue in 2023.

This chapter discusses the objectives and strategy of NWO-I, the organizational structure and method of decision making, the composition of the Executive Board and management, the role of the institute advisory councils, the code of conduct and how NWO-I deals with complaints. The last part of this chapter describes the internal audit function and the assurance of good governance.

7.1 Objective of the NWO-I foundation

The NWO-I foundation's purpose is to:

- Promote excellent science and the overall quality of scientific research;
- Conduct high quality scientific research in specific fields;
- Initiate and stimulate new developments in scientific research;
- Impart knowledge of the results of scientific research it initiated, conducted and stimulated for the benefit of society;
- Manage the institutes.

To this end, the NWO-I foundation focuses on, among other things, setting up and maintaining (institutional) (public-private) national and international collaborations, facilitating and conducting research, facilitating and participating in national and international organizations and partnerships, developing policy, developing, managing and operating scientific infrastructure, establishing substantive and business links between the NWO-I foundation and NWO, and training researchers.

7.2 Organizational structure

7.2.1 Governance

The link between NWO and NWO-I is laid down in NWO's management regulations and in NWO-I's articles. NWO is an independent administrative body under the responsibility of the Ministry of Education, Culture and Science. NWO's mission and tasks are laid down by law. Since the entry into force of the new NWO Act in 2017, the NWO structure includes an Executive Board with four domains underneath and a separate NWO institutes organization (NWO-I). The Executive Board is ultimately responsible for the domain organization and the Foundation Board for the institute organization.

The Foundation Board of NWO-I forms a personal union with the NWO Executive Board: the boards consist of the same individuals. The NWO Executive Board is responsible for defining the mission and scientific strategy of each institute.

The Foundation Board is responsible for the maintenance and day-to-day management of the foundation and for carrying out the missions of the institutes.

The NWO-I Foundation Board adheres to the Good Governance Code for Public Service Providers.

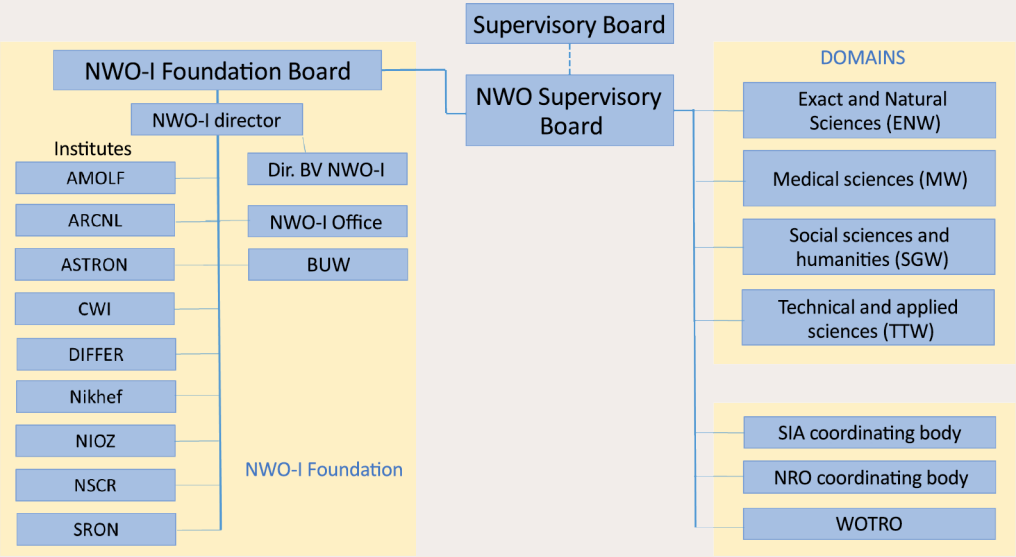
7.2.2 Supervisory Board

NWO has a Supervisory Board in addition to the Executive Board. The Supervisory Board assists the Executive Board and provides advice on NWO policy when requested or on its own initiative. Advice from the Supervisory Board can also relate to the NWO-I foundation. The Supervisory Board was established by the Minister of Education, Culture and Science as of March 1, 2017. It consists of six members as of January 1, 2019. The term of office is five years. This annual report includes a section (7.6.3) containing a report from the Supervisory Board, which pertains to the NWO-I Foundation. The members are listed here as well.

NWO's supervisory board has an audit committee. In 2019, this committee consisted of two members of the Supervisory Board. Among other things, the audit committee monitors the quality of operations, the financial reporting process, the statutory audit of the financial statements and the effectiveness of the internal risk and control system. In connection with NWO's designation as a Public Interest Entity (PIE), the Supervisory Board appointed a third external member at the end of 2019. The activities of the audit committee are included in the Supervisory Board's report.

7.2.3 Organizational units and governance

The figure below shows how the various components are arranged within the organization. It also shows how NWO and NWO-I relate to each other.



NWO-I director

The NWO-I director is responsible for day-to-day management of the NWO-I foundation and for ensuring that the institutes' missions are carried out. The NWO-I director manages the institute directors and the NWO-I director of operations.

Institutes

Each institute is managed by an institute director. Institute directors are integrally responsible for the day-to-day management of the institute. They also bear responsibility for the scientific fleshing out of the institute's mission and the accompanying strategy. They receive support in this regard from an institute manager or equivalent officer who is operationally responsible for the management of the institute.

The following nine institutes comprise NWO-I:

- **AMOLF | Physics of functional complex matter**
AMOLF conducts fundamental research into complex material systems;
- **the collaboration ARCNL | Advanced Research Center for Nanolithography**
ARCNL conducts high-quality fundamental research in the field of nanolithography, providing knowledge that contributes to the production of ever smarter and smaller electronics;
- **ASTRON | Netherlands Institute for Radio Astronomy**
ASTRON makes discoveries in radio astronomy possible;
- **CWI | Centrum Wiskunde & Informatica**
CWI conducts fundamental and groundbreaking scientific research in mathematics and computer science and is committed to the successful transfer of its research results to society;
- **DIFFER | Dutch Institute for Fundamental Energy Research**
DIFFER conducts leading fundamental research in the fields of nuclear fusion and solar fuels by bringing together different disciplines in close collaboration with universities and industry;
- **Nikhef | National Institute for subatomic physics**
Nikhef is the national institute for subatomic physics, pushing the boundaries of our knowledge about the elementary building blocks and interactions in the universe;
- **NIOZ | Royal Netherlands Institute for Sea Research**
NIOZ focuses on groundbreaking fundamental and frontier-applied scientific marine and oceanic research; the latter primarily focuses on "Blue Growth": future economic activities at sea with a keen eye for sustainability;
- **NSCR | Netherlands Institute for the Study of Crime and Law Enforcement**
NSCR develops empirically substantiated knowledge of crime and criminals in a social context, as well as prevention and (judicial) approaches to crime;
- **SRON | Netherlands Institute for Space Research**
SRON is the national expert institute for scientific research from space, and home to the Dutch membership of the European Space Agency (ESA).

The institutes are *national* institutes: they each have one or more national roles based on which they add value to the Dutch knowledge system. They drive or coordinate specific research areas and/or develop, manage and operate national or international scientific infrastructure or facilitate the Dutch scientific contribution to large international treaty organizations. Via the institutes, NWO-I participates in a large number of collaborations. For example, our institutes work closely with all the Dutch universities, but also with universities of applied sciences, TO2 institutes, companies, and other public and private parties.

NWO-I Office

The NWO-I Office under the direction of the NWO-I director and the director of operations focuses on the preparation and implementation of board resolutions, the facilitation of the institutes and the facilitation of the (organization of the) operational management of the foundation. The NWO-I Office provides the institutes with services that benefit from being offered on a collective basis, such as scale benefits, quality enhancement, vulnerability reduction and cost reduction. This includes, for example, support in the areas of strategy, financial management, procurement, real estate, human resources, communications and legal affairs.

University Working Groups Administrative Unit

The University Working Groups Administrative Unit (BUW) includes approximately 100 university working groups at twelve university locations. At the head of each working group is a working group leader, usually a professor employed by the university involved. This working group leader is budget holder and manages the NWO-I employees, which include PhD students, postdocs and technicians. The NWO-I Office is responsible for managing research projects. The BUW is a remnant from the past, when NWO-I, in its former capacity as the FOM foundation, also awarded projects to universities. The final projects are expected to be concluded over the course of 2024, after which this organizational unit will be dissolved.

Decision making

The NWO-I Foundation Board grants the NWO-I director power of attorney and power of representation to conduct day-to-day management of the (organization of) the foundation. With the authority granted, the NWO-I director is responsible for making day-to-day management decisions for the foundation with the support of the NWO-I director of operations. Decisions that impact the scientific strategy and/or missions of the institutes are always made by the NWO Executive Board.

Under the leadership of the NWO-I director, the institute directors, together with the director of operations, form the meeting of directors. This meeting discusses developments at the level of the institute organization. They also share experiences and set up joint policy frameworks that apply to the entire institutes organization. In addition to the meeting of directors, there is also a meeting of institute managers and various functional meetings at NWO-I, including for communications, ICT, finance and personnel & organization.

After the departure of the NWO-I director in 2021, the management duties were taken over by the chairman of the board and the remaining duties of the general director were largely taken over by the director of operations, pending a decision on a change in governance.

7.3 Composition of the NWO-I Foundation Board

The NWO-I Foundation Board is the highest governing body at NWO-I. The Foundation Board forms a personal union with the NWO Executive Board. The president was appointed as of April 1, 2021 for a five-year term. The vice president was appointed as director as of October 1, 2016 for a five-year term; the appointment was renewed for another five years on October 1, 2021. The other members were appointed in 2020 for three years. Officially, as of December 31, 2021, the NWO-I Foundation Board consisted of three female and three male board members.

Members of the NWO Executive Board and NWO-I Foundation Board

- Professor Marcel Levi (president, also president of the NWO Executive Board)
- Caroline Visser (vice chair, portfolio holder Operations and Finance)
- Professor Jan de Boer (president ENW domain)
- Professor Anita Hardon (chair SGW domain)
- Professor Margot Weijnen (chair TTW domain)
- Professor Arfan Ikram (chairman domain MW) *since August 1, 2022*
before that Prof. Jeroen Geurts *January 1-15, 2022*

7.3.1 Management of NWO-I

The Foundation Board is supported by the NWO-I Office. The NWO-I director is also secretary of the Foundation Board. The NWO-I director has integral leadership of the NWO-I foundation.

The departure of the NWO-I director in June 2021 prompted the NWO Executive Board to reconsider, based on external advice, the position and role of the NWO-I director and the existing governance structure. In the period following the NWO-I director's departure, his duties were assumed by the president of the Foundation Board,

the director of operations and head of strategic support. In this context, the president assumed the role of external figurehead as well as the role as manager of the institute directors.

The NWO-I director of operations, Jan van der Boon, is responsible for the operational management of the foundation as a whole. After the departure of the NWO-I director, he became acting secretary of the Foundation Board and took charge of the entire NWO-I Office.

Changes in institute directors for ASTRON, ARCNL and DIFFER

On May 1, Dr. Jessica Dempsey joined ASTRON as its director. On July 1, Prof. Dr. Joost Frenken stepped down as director of ARCNL and from October 1 Dr. Wim van der Zande will be acting in this position. The appointment of interim director of DIFFER Prof. Dr. Marco de Baar was converted on July 1 into a regular appointment until July 1, 2025.

7.3.2 Employee representation

Employee representation structure at NWO-I

NWO-I has had a Group Works Council since July 2021: the NWO-I Group Works Council. The institutes and the Office each have one representative in the NWO-I Group Works Council. The BUW is entitled to two members in the NWO-I Group Works Council, but these vacancies were not filled in 2022. The NWO-I Group Works Council may consist of a maximum of 12 members.

The NWO-I Group Works Council deals with topics of concern for NWO-I as a whole and consults with the NWO-I director. All members of the NWO-I Group Works Council automatically hold a seat - together with three members of NWO-D - in the NWO's Central Works Council. The NWO Central Works Council deals with issues affecting NWO as a whole and consults with the NWO Executive Board.

In 2022, the NWO-I Group Works Council dealt with a total of 14 requests for advice or consent, most of these were in the context of the development of business operations (see 7.7.3), but also a request for consent in relation to hybrid working and the Occupational Health and Safety year plan.

In February 2022, the NWO-I Group Works Council agreed to the policy framework and Hybrid working scheme to be deployed as a pilot NWO-I-wide in 2022. Within the NWO-I Hybrid working scheme, each institute and the Office can make additional agreements for hybrid working in consultation with its own works council. The NWO-I Group Works Council also approved the NWO-I model declaration on Hybrid Working, which provides the option for institutes and the Office to establish agreements with employees on hybrid working. If institutes or the Office wishes to use a different/adapted (model) declaration to record the agreements, they must seek the consent of their local works council to do so. After the evaluation of the pilot - postponed to 2023 - a definitive NWO-I Hybrid Working scheme and the results of the pilot will be submitted to the NWO-I Group Works Council for approval.

An intensive process in relation to the advisory requests for the development of operations was conducted with the NWO-I Group Works Council in 2022. In May 2022, the NWO-I Group Works Council advised negatively across the board. In particular, the NWO-I Group Works Council felt that a concrete elaboration of the proposals for, among other things, impact in terms of personnel, tasks and competences, was missing and that there was no social flanking policy for accommodating any impacts in terms of personnel. In its advice, the NWO-I Group Works Council expressed a positive opinion about the direction (vision) and, in line with the assessment framework drawn up by the NWO-I Group Works Council, identified a number of preconditions for the elaboration, such as ensuring good support throughout the organization and clarity about tasks, responsibilities and powers. In the follow-up consultation with the director, a social flanking policy was agreed upon. It was also agreed that a more detailed improvement proposal will be submitted for each domain of operations to the NWO-I Group Works Council for advice, accompanied by a separate request for advice for the NWO-I Office organizational plan. This was done over the course of 2022 and the discussion is ongoing and is expected to be completed in 2023. Throughout the advisory process, the NWO-I Group Works Council involved the local works councils via joint analyses of the requests for advice and periodic updates.

7.4 Institute Advisory Councils

As stipulated in the NWO-I articles, each institute has an institute advisory council. The institute advisory council has an independent position and provides solicited and unsolicited advice to the institute director and the NWO Executive Board. The institute director is the point of contact for the institute advisory council. In 2018, the Foundation Board adopted the regulations of the institute advisory council. These regulations were updated at the end of 2020 to reflect the new articles, which provide that appointment of the member of the institute advisory council is ratified by the NWO Executive Board. Previously, this would be decided by the Foundation Board.

The starting point is that the institute advisory council plays an important role in keeping the institute connected to relevant national stakeholders. The council contributes to the optimal maintenance of strategic relationships with science, the business sector, local or national politics, and other relevant social parties, and acts as a critical interlocutor to the director. The composition of the institute advisory council therefore ties in with representatives from science, society and the business sector who have an affinity with the institute's research. It also includes one or more representative(s) from domain boards relevant to the institute.

In addition to the institute advisory council, virtually all the institutes have a science advisory council. This council advises the director of the institute on the scientific quality of the research conducted by the institute, on providing direction to the institute's research and on the alignment with and/or adherence to the broader international scientific context. In addition, the director may request advice on specific institute matters.

7.5 Codes of conduct and complaints procedure

7.5.1 Code of conduct desired behavior

Employees as well as third parties, such as visitors or employees of hired companies, can be involved in undesirable behavior. The code of conduct therefore requires everyone working for or on behalf of NWO-I to act with integrity, respect and professionalism. These three behavioral traits are the guiding principle for desired behavior at NWO-I and a prerequisite for an optimal work environment. All organizational units (institutes and the NWO-I Office) have one or more confidential advisers to whom employees can turn if they are confronted with undesirable behavior.

7.5.2 Complaints procedure

NWO-I observes the individual right of complaint. The employee, intern or seconded person therefore has the opportunity to make their complaint about conduct by or on behalf of the employer towards the employee the subject of discussion. This will be investigated in such a way that it guarantees that the complaint is handled justly and that the individual's interests are reasonably protected. The procedure is defined in the implementing regulations (IR 11). There were no complaints handled by the complaints committee in 2022.

NWO-I also has a whistleblower regulation that employees can turn to if they suspect misconduct.

The confidential adviser for the whistleblower regulation was Dr. Tanja Kulkens. She was consulted twice in 2022, but this did not result in any report being filed. Because Kulkens became director of the NWO's Exact and Natural Sciences domain effective September 1, 2022, she has indicated that she will step down as confidential adviser for the whistleblower regulation. A successor is being sought.

7.5.3 Complaints related to scientific integrity

The Dutch code of conduct for scientific integrity, which has been in force since the end of 2018, includes guidelines for, among other things, how to deal with suspected violations of scientific integrity. The code formulates duties of care for the institution. NWO-I has its own complaints procedure for Scientific Integrity (WI) and confidential advisers for Scientific Integrity. The Scientific Integrity complaints committee did not handle any complaints in 2022.

During 2022, the Scientific Integrity confidential advisers physically visited all the NWO institutes except for NSCR. The confidential advisers were virtually in attendance here last year at an institute event on scientific integrity. The visit to NSCR was scheduled for early 2023. During the visits to the eight other institutes, discussions were held with the director, management, confidential advisers and (delegations of) staff and doctoral students/post-docs. The purpose of the visits was to introduce the confidential advisers, get information on how scientific integrity is maintained in the context of the agreed duty of care, and what issues were important in 2022. For their consideration, the confidential advisers conveyed to all directors that scientific integrity should be regularly discussed at the directors' meeting. This will allow for more uniform management than if the institutes would organize this separately.

In 2022, the confidential advisers were consulted twice. Both times involved a case that did not fall under scientific integrity, but rather involved workplace behavior. In 2022, Thom Palstra and Tanja Kulkens were Scientific Integrity confidential advisers. A successor will be sought for Kulkens in 2023, as she is now the director of the NWO's Exact and Natural Sciences domain.

7.6 Horizontal accountability

Horizontal accountability involves internal and external actors. In addition to the works council, important actors include the NWO Supervisory Board and the audit committee.

Other actors for whom the financial statements are important are NWO, partly for the purpose of consolidating the NWO-I figures in its financial statements in rendering account to the Ministry of Education, Culture and Science, the European Union and other granting parties, the tax authorities, the bank and the Ministry of Finance for the purposes of Treasury banking, in addition to insurance companies and other creditors.

7.6.1 Internal management and control system

An administrative organization and internal control system (AO/IC) has been agreed upon and is being observed at NWO-I. Findings arising from the external auditor's management letter are discussed and explained in the Foundation Board and audit committee. The Foundation Board and the audit committee will provide direction to the NWO-I organization on matters related to development and/or improvement.

NWO's Internal Audit department will also conduct investigations that culminate in a report with findings and recommendations that are discussed with stakeholders and revisited by the audit committee.

The Foundation Board and audit committee are periodically briefed on the financial position of NWO-I in the form of quarterly reports in addition to the financial statements and multi-year budget. These documents pay due attention to developments in the organization, risks, order book and liquidity in a multi-year perspective in addition to the annual forecast and numerical analysis.

7.6.2 Internal Audit

NWO's Internal Audit (IA) department is used for the entire group, including NWO-I. The purpose, duties, responsibilities, powers and functioning of the department are detailed in an *audit charter* and in a quality control system and policy. Both were updated in 2021 and provide a framework for IA's service provision to the directors of NWO and NWO-I, the NWO Executive Board, NWO-I's Foundation Board, the audit committee and the NWO Supervisory Board.

An audit plan and detailed work program is prepared for each audit and coordinated with the manager or director responsible for the subject (auditee). A draft report is prepared for each audit and discussed with the auditee, who is given the opportunity to comment. Those comments are incorporated and the report is subsequently finalized. Audit reports are discussed in the NWO management team and Executive Board or the

NWO-I meeting of directors and Foundation Board, depending on the topic. A summary of all the topics is presented to the audit committee of the Supervisory Board annually.

In 2021, the following internal audits were ongoing at NWO-I: invoices (completed in 2021), safety (due to COVID-19 restrictions carried forward to 2022), diversity and gender pay (completed in early 2022), related parties (completed in early 2022).

7.6.3 Supervisory Board

In 2022, the Supervisory Board met nine times, with seven of these being plenary meetings in the presence of the members of the Executive Board on both internal matters and external developments. As part of the introductions to the organization, the Supervisory Board had a brief tour in February with a presentation on the research in the new SRON building in Leiden. In September, the Supervisory Board was a guest of NIOZ on Texel where the newest addition to the national research fleet could be viewed. The Supervisory Board held evaluation interviews with individual Supervisory Board members in April, June and November. The attendance of the chair of the Supervisory Board scheduled for the December general meeting between the director and the Central Works Council had to be postponed to January 2023.

In preparation for the Supervisory Board meetings, the audit committee met five times with the portfolio holder for operations and finance of the Executive Board. These meetings focused on internal control and risk management, the operations and the implementation of the updated OWB control protocol. Both the audit committee and the Supervisory Board discussed findings on the 2021 financial statements, the 2022 management letter and the 2023 audit plan with the external auditors. Furthermore, the audit committee advised on the individual financial statements, the impact of the war in Ukraine, the tender procedure for appointing auditors, charter for the Audit Risk Compliance committee, implementation of the new finance system at NWO-I, developments in relation to knowledge and cybersecurity and the 2023 budget.

As of December 31, 2022, the Supervisory Board comprised the following members:

Supervisory board composition on December 31, 2022	Term of office until**
Dirk Jan van den Berg (chair)	04-01-2025
Amandus Lundqvist (vice president)*	02-28-2027
Dr. Adriana Esmeijer	02-28-2027
Willem te Beest	02-28-2027
Vacancy (until September 1, 2022 Prof. Dr. Melinda Mills)	vacant
Professor Simone Buitendijk	01-01-2024

* Appointed upon nomination by the Minister of Economic Affairs.

** At the beginning of 2022, Lundqvist, Esmeijer and Te Beest were appointed for a second term of up to five years.

A phased retirement schedule will be determined for the sake of continuity.

7.7 Organizational development

7.7.1 Moving toward a stronger institute organization

Since NWO's institutes were brought together in a single foundation, the institutes and the Office have been working on a common understanding of the organization's identity and strategy, the positioning of the institutes in the Dutch knowledge field, and a method of developing joint policy. Major steps were already taken in 2021 to strengthen the synergy between the institutes and Office as well as the effectiveness of the organization.

In October 2021, the board decided on a total package of measures to make the organization financially sound and took a preliminary decision at the end of 2021 to further develop joint operations. The process of submitting this proposed decision to the employee representatives began in 2022.

7.7.2 Developments in operations

An ambitious trajectory for the further development of business operations was initiated in 2022 under the direction of the NWO-I Executive Board. The key reasons were:

- The institutes are not yet sufficiently experiencing the added value of the collectivity. Part of the purpose of the merger was to allow the institutes to benefit from **best practices** and from the support and expertise of the foundation's Office. This development is yet to make sufficient progress.
- The quality of operational management is not yet at a level consistent with the position and ambitions of the NWO institutes with their nationally and internationally leading position in the scientific field. Our own analyses and the findings of the auditor show that project administration, fiscal control and cyber security, among other things, need improvement. Compliance is still unsatisfactory in some areas, including GDPR. Last but not least, clear frameworks are still lacking in important areas, for example in the form of strategic HR policy.
- Efficiency gains appear to be achievable in areas such as financial and HR administration. In other domains, like public affairs, business control, information management, coordination of non-research-related IT, and the legal function, it would be logical to strengthen the capacity. There is ambiguity about the costs of operational management and how to finance this.

Whereas in 2021 a trajectory was followed to arrive at improvement proposals for various domains of the operations, 2022 was devoted to developing these improvement proposals further and converting them, where possible, into action plans for nine different domains (management support & strategy, finance & control, procurement, personnel & organization, communication, housing & facilities, occupational health and safety & environment, ICT & security, and legal affairs). Before any implementation could take place, an advisory process with the employee representatives was started. This includes agreements around social policy.

A change process is always more complicated than it seems at first glance. This is why a lot of time was spent in 2022 on sharpening the objectives of the changes and how these should be implemented. Both in the functional discussions within the nine domains, as well as in discussions with and within the employee representative body. At the beginning of 2022, the ambition was for the change process to be completed before the end of the year (i.e., for implementation to have started), but that goal was not achieved, unfortunately. Constructive discussions with all the participants (including the employee representatives) were held at the beginning of 2023 to bring the process to a successful end in 2023.

List of abbreviations

ABP	Algemeen Burgerlijk Pensioenfonds [General Pension Fund for Public Employees]
AMOLF	Institute for physics of functional complex matter
AO	Administrative organization
ARCNL	Advanced Research Center for Nanolithography
ASTRON	Netherlands Institute for Radio Astronomy
BUW	University Working Groups Administrative Unit
CLA	Collective Labor Agreement
COR	Central Works Council
CWI	Research Institute for Mathematics & Computer Science in the Netherlands
DIFFER	Dutch Institute for Fundamental Energy Research
DUBBLE	Dutch-Belgian BeamLine
ENW	NWO domain Exact and Natural Sciences
ERC	European Research Council
EU	European Union
EZK	Ministry of Economic Affairs and Climate Policy
ET	Einstein Telescope
FOM	Foundation for Fundamental Research on Matter
FTE	Full time equivalent
IC	Internal control
KNAW	Royal Netherlands Academy of Arts and Sciences
LOFAR	Low Frequency Array
NFU	Netherlands Federation of University Medical Centers
Nikhef	National Institute for subatomic physics
NIOZ	Royal Netherlands Institute for Sea Research
NSCR	Netherlands Institute for the Study of Crime and Law Enforcement
NWO	Dutch Research Council
NWO-I	Foundation for Dutch Scientific Research Institutes
Oio	PhD student
OCW	Ministry of Education, Culture and Science
P2IP	Particle Physics Inside Products BV
PCNI	Permanent Committee on National Institutes
PPP	Public Private Partnership
RU	Radboud Universiteit Nijmegen
RUG	University of Groningen
RvB-NWO	NWO Executive Board
RvT	NWO Supervisory Board
SEP	Strategy Evaluation Protocol
SKA	Square Kilometer Array
SRON	Netherlands Institute for Space Research
TO2	knowledge institutes for applied research (united in the TO2 federation)
UNL	Universities of the Netherlands
VH	Netherlands Association of Universities of Applied Sciences



2022 Financial statements

Foundation for Dutch Scientific Research Institutes (NWO-I)

This is an English translation of an official Dutch financial statement. This financial statement is an English translation of the financial statement prepared on June 15th 2023. In case of any discrepancies or possible differences in interpretation between the English translation and the financial statement prepared on June 15th 2023, the latter prevail. The original and official Dutch financial statements are available [here](#)

1 General accounting policies

General

The Foundation for Dutch Scientific Research Institutes (NWO-I) is based in Utrecht.

The organization is registered with the Chamber of Commerce under number 41150068. According to its articles, NWO-I's objectives are to:

Promote excellent science and the quality of scientific research in general;

- a conduct high-quality scientific research in specific fields;
- b initiate and stimulate new developments in scientific research;
- c transfer knowledge from the scientific research that they have initiated, conducted, and promoted, for the benefit of society.
- d manage institutes;
- e and do everything that is directly or indirectly related to the above or can be conducive to it.

Standards applied

The financial statements have been prepared in accordance with the Dutch Accounting Standards (DAS 660). These regulations provide that the provisions of Title 9, Book 2 of the Dutch Civil Code and the Guidelines for Annual Reporting apply, subject to the exceptions indicated therein. The financial statements were prepared on June 15, 2023.

Principles for the valuation of assets and liabilities and the determination of the result

General accounting policies

These financial statements have been prepared under the going concern assumption. An asset is recognized in the balance sheet when it is probable that the organization will receive future economic benefits, the value of which can be measured reliably. A liability is recognized in the balance sheet when it is probable that settlement of the liability will be accompanied by an outflow of resources embodying economic benefits, the size of which can be measured reliably.

Income is recognized in the statement of income and expenditure when an increase in economic potential, associated with an increase in an asset or a decrease in a liability, has occurred, the size of which can be measured reliably. Expenses are recognized when a decrease in the economic potential related to a decrease in an asset or increase in a liability has taken place, the size of which can be measured reliably.

If a transaction results in virtually all or all future economic benefits and all or virtually all risks relating to an asset or liability being transferred to a third party, the asset or the liability is no longer reported in the balance sheet. Assets and liabilities are also no longer reported in the balance sheet from the moment at which the conditions of the likelihood of the future economic benefits and/or the reliability of the determination of the value are no longer satisfied.

Income and expenditure are allocated to the period to which they relate.

The financial statements are presented in euros, the organization's functional currency. All financial information is indicated in thousands of euros unless otherwise stated. Negative values in the tables are shown in brackets ().

Scope of consolidation

The following legal entities belong to the scope of consolidation (DAS 217.301) of NWO-I:

- Astrotec Holding BV (100%) in Dwingeloo
- CWI Incubator BV (100%) in Amsterdam
- NIOZ Holding BV (100%) in Den Hoorn, which also includes NIOZ Haven, 100% owned by NIOZ Holding
- Particle Physics Inside Products BV (P2IP) in Amsterdam (100%)
- Stichting Wiskunde en Informatica Conferenties in Amsterdam (100%)

Based on Article 407(1), Book 2, Title 9 of the Dutch Civil Code, the aforementioned organizations are not consolidated and the exemption for consolidation on the grounds that the effect on NWO-I's solvency and liquidity is negligible is therefore applied. The participating interests are accounted for under financial fixed assets in the financial statements.

Other affiliated parties

The other affiliated parties are parties with which NWO-I is permanently affiliated and which satisfy the definition of an affiliated party:

- JIV-ERIC
- Stichting C.A. Muller Radio Station
- Stichting Lofar*
- Stichting International LOFAR Telescope
- Stichting Beheer Wetenschappelijk Centrum Watergraafsmeer
- Stichting Netherlands eScience Center

Nature of affiliation

Joint Institute
Director appointment
Director appointment
Founding partner
Board participation
Board participation

**The LOFAR Foundation was dissolved on April 26, 2023.*

ARCNL

NWO-I is participant in the Advanced Research Center for Nanolithography (ARCNL) collaboration. Because NWO-I appoints one of the four members of ARCNL's Governing Board, ARCNL is consolidated for 25% of ARCNL's value in NWO-I's financial statements (proportional consolidation). In the financial statements, the inter-entity debts, receivables and transactions have been eliminated in proportion to the share in ARCNL.

Use of estimates

The preparation of the financial statements requires the management to form opinions and make estimates and assumptions that affect the application of policies and the reported values of assets and liabilities, and income and expenditure. The actual results may deviate from these estimates. The estimates and underlying assumptions are subject to continuous reassessment. Revisions to estimates are recognized in the period in which the estimate is revised and in any future periods affected.

Foreign currency accounting policies

A foreign currency transaction is initially measured at the exchange rate on the transaction date. Monetary balance sheet items denominated in foreign currencies are translated at the exchange rate on the balance sheet date. Non-monetary balance sheet items denominated in foreign currency and measured at historical cost are translated at the exchange rate on the transaction date. Non-monetary balance sheet items denominated in foreign currency and measured at current value are translated at the exchange rate prevailing at the time of valuation of the item.

Exchange differences arising on settlement or conversion of monetary items denominated in foreign currencies are recognized in the statement of income and expenses, except for exchange differences arising from the net investment in a business operation abroad or loans taken out to finance or effectively hedge the net investment

in a business operation abroad. These exchange differences are recognized directly in the translation differences reserve. NWO-I does not have a translation differences reserve.

Exchange rate differences arising from the conversion of a non-monetary balance sheet item denominated in a foreign currency that has been valued at fair value are recognized directly in equity as part of the revaluation reserve, if the change in value of the non-monetary item is also recognized directly in equity.

Financial instruments

Financial instruments include both primary financial instruments, such as receivables, securities and debts, and derivative financial instruments (such as derivatives).

For the accounting policies for the primary financial instruments, please refer to the treatment per balance sheet item.

Loans granted and other receivables

Loans granted and other receivables are initially recognized at fair value plus any transaction costs and subsequently at amortized cost using the effective interest method. Income and expenses are recognized in the statement of income and expenditure as soon as the loans granted and other receivables are transferred to a third party or become impaired.

Other financial liabilities

Other financial liabilities are measured on their initial recognition at fair value less transaction costs and are valued subsequently at amortized cost using the effective interest method. The repayment obligations $t+1$ of the long-term liabilities are included in current liabilities.

Determination of fair value

The fair value of a financial instrument is the amount for which an asset could be traded or a liability settled between knowledgeable and willing parties in an arm's-length transaction. A number of notes in the financial reporting require the determination of the fair value of financial instruments. The fair value is determined in those cases by discounting the expected cash flows at a rate equal to the prevailing risk-free market interest rate for the remaining term plus credit and liquidity surcharges.

Netting

An asset and a liability item are netted in the financial statements only if and to the extent that:

- a sound legal instrument is available to settle the asset and the liability item netted and simultaneously; and
- there is a firm intention to settle the netted amount as such or both items simultaneously.

Price risk

NWO-I undertakes few commercial activities, so there is little price risk.

Credit risk

Accounts receivable include receivables from grantors and receivables from other debtors. The credit risk on these receivables is limited.

Interest rate risk and exchange rate risk

NWO-I incurs only limited interest rate risk on its debt, as cash flows are largely independent of market interest rates. The liquid assets are held at the government. NWO-I runs relatively little exchange rate risk. This is because virtually all transactions take place in euros. The policy is not to use derivative financial instruments to manage (interim) interest rate fluctuations.

Liquidity risk

NWO-I uses treasury rules to manage liquidity risks. The fundamental principle of the treasury rules is that the NWO-I monies may not be invested or used as collateral. All liquid assets are held at the Ministry of Finance, with the exception of a specific bank account for the benefit of SRON.

Present value

The discount rate to be applied is the market interest rate as of the balance sheet date of high quality corporate bonds, in the absence of a liquid market for these bonds, the yield on government bonds (DAS 252).

NWO-I is bound to treasury banking with the Ministry of Finance. In other words, the liquid market for corporate bonds is not available for NWO-I. For the discount rate, NWO-I uses the interest rates for government bonds, as listed on the website of the Ministry of Finance, Agency of the General Treasury.

The term of the personnel provisions at NWO-I is less than 10 years, except for the provision for long-service awards. All provisions are presented at present value. The effect of the present value calculation is reflected in the statement of movements in the provisions and has been deducted from the personnel expenses.

The term of the Other provisions at NWO-I is fixed at 10 years, this provision is also calculated at present value and the effect is accounted for as interest income.

NWO-I has made a calculation to present value both for the Provisions and for the off-balance sheet liabilities and off-balance sheet assets. Based on this calculation, it was concluded that the effect of the recalculation is material, and an adjustment of the positions was implemented accordingly. This has been made visible for the various items to which this applies.

2 Balance sheet valuation

accounting policies

Intangible fixed assets

An intangible fixed asset is included in the balance sheet if:

- it is probable that future economic benefits associated with an asset will accrue to the group; and
- the expenses of the asset can be reliably measured.

Expenditure on an intangible fixed asset that does not meet the conditions for capitalization is recognized directly in the statement of income and expenditure.

The intangible fixed assets are valued at acquisition or manufacturing price, less accumulated amortization and, if applicable, cumulative impairments. The costs of development are capitalized if the conditions stipulated for technical, commercial and financial feasibility are fulfilled. Another legal reserve is maintained in the amount of the balance sheet value.

Intangible fixed assets are amortized systematically on the basis of their estimated useful life with a maximum of twenty years using the straight-line method. The useful life and amortization method are reassessed at the end of each fiscal year.

Amortization rates:

- infrastructural costs of research and development: 15.38%-25%
- Other intangible fixed assets: 25%

Tangible fixed assets

Tangible fixed assets intended for grant projects and projects with companies are valued at cost (acquisition or manufacturing price) less accumulated depreciation, if applicable, accumulated impairments and, if applicable, taking into account a residual value.

Tangible fixed assets not intended for own use are not depreciated and are charged directly to the project in question in the year of acquisition.

Contributions received from grantors for the financing of tangible fixed assets are accounted for as investment grants received in advance under the long-term or current liabilities, respectively. The investment grants are realized according to the depreciation of the relevant tangible fixed assets. The release of the investment grants is deducted as movement in investment grants from depreciation expense in the statement of income and expenditure.

The depreciation is calculated as a percentage of the acquisition price according to the straight-line method. The rate is based on the expected useful life of the asset. Land and tangible fixed assets under construction and prepayments on tangible fixed assets are not depreciated. Depreciation takes place from the moment the asset is put into use. If the expectation regarding the depreciation method, useful life and/or residual value undergoes changes over time, they are accounted for as a change in estimate.

The following depreciation rates are applied:

- Buildings: 3% - 20% per year
- Land: no depreciation
- Inventory and equipment:
 - Installations and equipment: 5%-25% per year, depending on economic life
 - Office furniture: 10%-25% per year
 - Computer equipment: 20%-25% per year
- Other tangible fixed assets:
 - Vessels: 3%-10% per year
 - Means of transport: 20% per year

The depreciation method is used with the application of the component method. For the buildings, the components can be divided into shell, elevators, floors, roofing and other. Depreciation periods are determined based on the estimated time of replacement maintenance.

Major maintenance costs are included in the cost as soon as these expenses are incurred and the capitalization criteria are met. The carrying amount of the components to be replaced is then considered disinvested and charged to the statement of income and expenditure as a lump sum. All other maintenance expenses, insofar as they constitute 'minor' maintenance, are recognized directly in the statement of income and expenditure.

Financial fixed assets

Participating interests where the organization can exercise significant influence on the business and financial policy are measured according to the equity method on the basis of their net asset value. Participating interests with a negative asset value are stated at zero. If NWO-I guarantees the debts of the participating interest in question, a provision is created, provided there is an expected outflow of resources. This provision is formed primarily at the expense of the receivables from this participating interest and, for the remainder, under the provisions, for the amount of the share in the losses suffered by the participating interest, or for the expected payments by the organization for this participating interest.

Participating interests in which no significant influence can be exercised are valued at cost or permanently lower value in use.

NWO-I provides interest-bearing monetary loans to startup companies of former employees as part of the valorization of research results. These so-called starter loans are recorded on the balance sheet at amortized cost. For each loan, an estimate is made of the risk that the loan cannot be repaid. In that case, a provision for irrecoverability is made.

Impairments

Fixed assets are reviewed for impairment whenever changes or circumstances arise that suggest that the carrying amount of an asset may not be recoverable.

Disposal of fixed assets

Assets available for sale are measured at the lower of their carrying amount and net realizable value.

Projects in progress

Projects in progress are determined based on the "percentage of completion" method, or PoC method. The balance of projects in progress is valued at the directly attributed cost of labor and materials with a surcharge for indirect costs on the personnel expenses. Invoiced installments / advances received are deducted from the balance of projects in progress.

Grant projects and third-party projects

NWO-I is involved in many complex grant projects and third-party projects. Projects with a positive balance are included under receivables. Projects with a balance of amounts received in advance are included in current liabilities.

Other current receivables

Current receivables are initially recognized at fair value increased with the directly attributable transaction costs and subsequently measured at amortized cost less any necessary provision for irrecoverability.

Liquid assets

Liquid assets means cash, balances in bank accounts, bills of exchange and checks.

Liquid assets are stated at face value. These are at the organization's free disposal unless otherwise noted.

Liquid assets not (expected to be) available to the group for more than twelve months are classified as financial fixed assets.

Equity

Presented under equity are the general reserve, earmarked reserves, earmarked funds and other legal reserves. The general reserve consists of the reserves at the free disposal of NWO-I. If a more limited spending possibility has been imposed by the Foundation Board, the part of the equity thus segregated is designated as an earmarked reserve. All reserves of the institutes and Office are earmarked reserves. If the more limited spending possibility has been imposed by third parties, then this portion is designated as an earmarked fund. The movement statement shows all earmarked funds separately. The other legal reserve was formed pursuant to DAS 240.229. Capitalized costs of self-developed software are included in capitalized development costs for which a legal reserve must be created.

Provisions

Unless otherwise stated, all provisions are measured at the present value of the expenditures expected to be necessary to settle the liabilities and losses. The discount rate used is the interest rate as listed on the Ministry of Finance's site at the end of December 2022 (indicatively, 1 year 2.59%, 5 years 2.7%, 10 years 2.85%).

A provision is recognized in the balance sheet when there is:

- a legally enforceable or constructive obligation resulting from a past event; and
- of which a reliable estimate can be made; and
- it is likely that settlement of that obligation will require an outflow of funds.

If it is probable that any of the expenses expected to be necessarily incurred to settle the provision will be reimbursed by a third party, wholly or in part, the reimbursement is presented as a separate asset. Additions to the provisions are made at the expense of the statement of income and expenditure. Expenditures are made directly from the provision. For each provision it is indicated how it is valued, therefore presentation either at nominal value if the difference between present and nominal value (the effect of time value) can be considered immaterial or at present value with a discount rate of 0%. To calculate the discount rate, NWO-I uses the interest rates for government bonds, as listed on the website of the Ministry of Finance, Agency of the General Treasury.

Provision for social policy, reorganizations and other legal status

This relates to the expenses of the 2015-2017 Social Plan for the 2015 reorganization at NIOZ. The provision was formed to cover future salary expenses of redundant employees. The calculation is based on the maximum benefit period of the employee in question and the expected transition payments or other charges.

This provision is presented at nominal value since the difference between present and nominal value (the effect of time value) can be considered immaterial.

Provision for long-service awards

This provision was established for liabilities arising from future long-service awards of personnel employed by NWO-I.

The assumptions used for the provision are:

- calculation rule: benefit payable * accrual rate, increased by a surcharge for salary increases and adjusted for the average likelihood of the NWO-I employees staying on;
- changes in the workforce are taken into account; a correction factor is applied to the calculated amount in connection with possible departures. This correction factor is based on 4.3% for 2022, resulting in a likelihood of staying on of 95.7%.
- To calculate the discount rate, NWO-I uses the interest rates for government bonds, as listed on the website of the Ministry of Finance, Agency of the General Treasury.

Unemployment contributions

NWO-I is self-insurer for the Unemployment Insurance Act (WW) and, in addition to the regular WW, has negotiated an Enhanced Scheme (BWOL) with the unions. If an employee of NWO-I becomes unemployed, the benefit is fully at the expense of NWO-I. The provision for unemployment benefits is based on the obligation to former employees known on December 31, 2022. These relate to benefit expenses payable during the maximum term of the benefit period at nominal value. This provision is presented at present value. The effect of the time value has been deducted from personnel expenses.

Long-term sick

In case of illness, NWO-I is obligated to continue paying employees 100% of their salary during the first year and 70% during the second, or 85% in case of sufficient reintegration. Pursuant to DAS 271, a provision has been created for the future salary costs of employees who are sick on December 31 of the year under review and for whom it is fairly certain that they will not return to work or will not return fully to work. The liability is calculated as the present value of future salary payments and transition payments. The effect of the time value has been deducted from personnel expenses.

Transition payment under the Work and Security Act

NWO-I employees who do not leave voluntarily after temporary employment are entitled to a transition payment in accordance with the Work and Security Act and the supplementary Balanced Labor Market Act.

As a result of amended legislation (Balanced Labor Market Act), from January 1, 2020, a provision must be created for all temporary employees, regardless of the period of the employment. Until January 1, 2020, a minimum employment period of two years applied.

The starting points used to calculate the size of the provision are:

- calculation rule for each temporary employee: benefit to be paid * accrual percentage (what percentage of the temporary employment has been accrued at the reference date), increased with a surcharge of the legally determined percentage of 7% due to the employer's contribution under the health insurance act and increased with an assumed or actual salary increase; the provision is discounted taking into account the applicable discount rate. The effect of the time value has been deducted from personnel expenses.
- no correction factor is applied for earlier termination of temporary contracts because this seldom occurs.

Generation Plan scheme

NWO-I employees with an employment contract who are within five years of the state pension age can participate in the Generation Plan scheme. Pursuant to this regulation, this employee shall be granted extraordinary leave with partial retention of pay. The scheme came into effect for the first time with the 2018-2019 CLA for Research Institutions and the scheme was renewed in the current CLA. The provision was created to cover the salary costs of this scheme. This provision for future payments to current participants of the Generation Plan for Research Institutions is based on a calculation of the rights accrued by employees up to the end of the year. This exclusively concerns the rights of employees who are actually using the scheme as of the balance sheet date. This provision is presented at present value. The effect of the time value has been deducted from the personnel expenses.

Provision for remediation of radioactive materials PiMu

In the basement of the PiMu building, located on a lot at the Amsterdam Science Park which NWO-I holds in leasehold until the end of 2023, there are materials that have become radioactive due to accelerator activities in the 1980s. NWO-I has an obligation to ensure proper disposal of the radioactive materials prior to termination of the ground lease. The cost of removing these radioactive materials will be equally shared between NWO-I and landowner NWO. For these removal costs, a provision was made in 2016 by NWO-I for the full obligation, a claim on landowner NWO was subsequently recognized separately.

In setting up the provision, NWO-I used both internal and external specialists to estimate these costs. The provision was reviewed in 2022.

This was based on the following principles:

- The estimate includes a detailed breakdown between the costs of demolishing PiMu and the portion explicitly related to the removal and disposal of radioactive material;
- In 2016, 20-cm thick concrete was designated as active. Further analysis of measurement and experience from other radiological removal projects teaches that for this situation about 50 cm should be used;
- The above point means not only higher demolition costs, but also much higher dumping costs at Covra;
- A correction has been made to the size of the dam wall construction.
- Increased construction/demolition costs due to inflation and price increases.

This provision is presented at present value. The effect of time value is presented as interest income.

Investment grants received in advance (long-term)

NWO-I received investment grants for the new construction and/or renovations of the following buildings: AMOLF, ASTRON, CWI, DIFFER, NIOZ and SRON.

For these grants, an annual release in proportion to the depreciation is recognized in favor of the statement of income and expenditure. The release is deducted from the item depreciation. The portion that will be released in the year under review is presented under current liabilities, investment grants received in advance (current).

Current liabilities and accrued liabilities

Liabilities with a remaining maturity of up to one year on the balance sheet date are designated as current liabilities. Liabilities are not netted with assets.

Accrued liabilities are amounts received in advance (including earmarked contributions) and amounts yet to be paid regarding expenses allocated to an expired period.

For supplementary grants made available for multiple years, the unspent portion is held on the balance sheet as an accrued liability. Release to the credit of the statement of income and expenditure then takes place annually pro rata to the expenditure. With this method of accounting, amounts received in advance are allocated to successive periods systematically and proportionate to time.

Financial assets and liabilities no longer included in the balance sheet

A financial instrument is no longer recognized in the balance sheet if a transaction results in all or virtually all rights to economic benefits and all or virtually all risks relating to a position being transferred to a third party. In accordance with the requirements of DAS 252, effective from fiscal year 2020, off-balance sheet liabilities and off-balance sheet assets are also valued at present value.

3 Accounting policies for the statement of income and expenditure

Determination of results

Income and expenditure are allocated to the fiscal year to which they relate. Gains are recognized only insofar as they have been realized on the balance sheet date. Losses and risks originating before the end of the year under review are taken into account if they have become known before the adoption of the financial statements.

Income

Revenue from the provision of services is recognized proportionally to the services provided, based on the services performed before the balance sheet date relative to the total services to be provided.

State contributions from OCW via NWO

State contributions from OCW via NWO are recognized as income in the statement of income and expenditure in the fiscal year to which the allocation relates.

Grant projects

Grants are recognized as income in the statement of income and expenditure in the fiscal year in which the subsidized costs were incurred, in the event of an own contribution to a subsidized project, the own contribution is spread over the term (matching).

Projects in progress

For projects in progress, income is recognized based on the "percentage of completion" method, or PoC method. Under this method, income is recognized based on progress. Progress is determined based on the actual estimated progress or the expenses. The balance from projects in progress is valued at the directly attributed cost of labor and materials with a surcharge for indirect costs of personnel expenses. Invoiced instalments / advances received are deducted from the balance of projects in progress.

Profit recognition of projects financed by third parties is determined in accordance with the PoC method.

Expected losses are recognized in the statement of income and expenditure as soon as they are known. A predefined own contribution to a project is not regarded as a loss on a current project, as a result of which no additional loss provision is created.

If the result of a current project cannot be reliably estimated, revenue is recognized in the statement of income and expenditure only up to the amount of the project costs incurred that are likely to be recoverable ("percentage of completion with zero profit" method).

Income in kind

Income in kind is stated at fair value (insofar as this can be reliably determined and is material) and recognized in the statement of income and expenditure.

Expenses

The expenses are determined in accordance with the aforementioned accounting policies and allocated to the fiscal year to which they relate. (Foreseeable) liabilities and possible losses originating before the end of the fiscal year are taken into account if they were known before the preparation of the financial statements and if the conditions for including provisions are satisfied.

Periodic interest charges and similar expenses are charged to the year for which they are owed.

Tenure-track positions

Where grants are involved, the commitment accounting system is applied. That is, when the grant is allocated, the entire grant is recognized directly as an expense (regardless of when this payment takes place). This applies, for example, to personnel grants from NWO-I for a university tenure-track position.

Personnel expenses

Salaries and social charges (including pension contributions) are recognized in the statement of income and expenditure on the basis of the employment conditions, insofar as they are payable to employees.

NWO-I is affiliated with the Stichting Pensioenfonds ABP. ABP is a sectoral pension fund with a defined benefit pension plan (multi-employer defined benefit scheme). Given that the pension plan is a multi-employer plan, the pension plan has been accounted for as a defined contribution plan.

The premise is that the pension expense to be recognized in the reporting period is equal to the pension contributions payable to the pension fund for that period. A liability is recognized for any pension contributions payable that remain unsettled on the balance sheet date. If the pension contribution already paid by the balance sheet date exceeds the pension contribution payable, an asset is recognized under prepayments and accrued income if the fund will refund this amount or offset it against future payable pension contribution.

A provision is also recognized at the balance sheet date for existing additional liabilities to the fund and employees if it is probable that an outflow of funds will be required to settle those liabilities and the amount of the liabilities can be reliably estimated. Whether or not additional liabilities exist is assessed on the basis of the administration agreement with the fund, the pension agreement with the employees and other (explicit or implicit) commitments to employees. The provision is measured at the best estimate of the present value of the amounts required to settle the liabilities on the balance sheet date.

NWO-I recognizes a liability if the organization has demonstrably made an unconditional commitment to pay a severance or transition payment. If the dismissal is part of a reorganization, NWO-I recognizes the cost of a severance or transition payment in a provision for reorganization costs.

Financial income and expenditure

Interest income is recognized on a time-proportionate basis in the statement of income and expenditure. This takes into account the effective interest rate of the asset concerned, if the amount is determinable and likely to be received.

Periodic interest charges and similar expenses are charged to the year for which they are owed.

Result from participating interests

The share in the results of investee companies includes the group's share in the results of these investee companies. Gains and losses on transactions that involved the transfer of assets and liabilities between the group and the non-consolidated participating interests, or between its participating interests themselves, are not recognized if they can be deemed unrealized.

The results of participating interests acquired or disposed of during the fiscal year are recognized in the result of NWO-I from the moment of acquisition and until the moment of disposal, respectively.

Cash flow statement

The cash flow statement has been prepared in accordance with the indirect method.

The cash in the cash flow statement consists of liquid assets and short-term securities. The securities can be considered highly liquid investments. Short-term highly liquid investments can be converted into cash without restrictions and without material risk of impairment as a result of the transaction.

Exchange rate differences on cash are shown separately in the cash flow statement.

Income and expenditure arising from interest, dividends received and tax on profits are included in cash flow from operating activities. Dividends paid are included under the cash flow from financing activities.

The acquisition price of acquired group companies and the sale price of sold group companies are included in cash flow from investing activities, to the extent that payment in cash has been made. Cash present in these group companies is deducted from the purchase price or sale price respectively.

Transactions involving no exchange of cash are not included in the cash flow statement.

4 Balance sheet on December 31, 2022 after result appropriation

		12-31-2022	2022 Budgeted	12-31-2021
		x €1,000	x €1,000	x €1,000
1	Assets			
1.1	Fixed assets			
1.1.1	Intangible fixed assets	3,243	3,365	3,992
1.1.2	Tangible fixed assets	184,636	208,241	169,575
1.1.3	Financial fixed assets	2,332	1,782	1,998
		190,211	213,388	175,566
1.2	Current assets			
1.2.2	Receivables	43,235	34,310	54,593
1.2.4	Liquid assets	81,810	51,333	60,401
		125,045	85,643	114,994
	Total assets	315,256	299,031	290,560
2	Liabilities			
2.1	Equity	115,558	78,345	91,843
2.2	Provisions	9,472	11,065	10,298
2.3	Long-term liabilities	74,235	103,515	79,403
2.4	Current liabilities	115,991	106,106	109,016
	Total liabilities	315,256	299,031	290,560

5 Statement of income and expenditure after result appropriation

	12-31-2022	2022 Budgeted	12-31-2021
	x €1,000	x €1,000	x €1,000
Income			
3.1 State contributions	154,683	143,960	136,772
3.2 Other government contributions and grants	682	49	1,850
3.4 Income from work for third parties	73,226	69,337	70,897
3.5 Other income	14,403	6,674	6,551
Total income	242,994	220,020	216,069
Expenses			
4.1 Personnel expenses	139,643	134,542	139,917
4.2 Depreciation/amortization	8,499	9,609	6,830
4.3 Housing expenses	11,876	13,598	15,349
4.4 Other expenses	61,064	65,982	56,518
Total expenses	221,083	223,731	218,614
Balance of income and expenditure	21,910	-3,711	-2,544
5 Realized revaluation	-	-	-
6 Financial income and expenditure	1,433	-3	8
Result	23,343	-3,714	-2,536
7 Taxes	-	-	-
8 Result from participating interests	372	-	-254
Result after taxes	23,715	-3,714	-2,790
9 Third-party share in result	-	-	-
Total net result	23,715	-3,714	-2,790

6 Cash flow statement

	12-31-2022		12-31-2021	
	x €1,000	x €1,000	x €1,000	x €1,000
Cash flow from operating activities				
Balance of income and expenditure	21,910		- 2,544	
Adjustments for:				
Depreciation/amortization	14,865		12,913	
Changes in provisions	- 827		-1,011	
Interest expenses associated with interest subsidies	-		-	
Change in working capital				
Receivables (-/-)	11,358		- 24,322	
Current liabilities	306		- 2,273	
Total cash flow from operations	47,612		- 17,237	
Interest received	1,981		12	
Interest paid (-/-)	- 549		- 5	
	1,433		8	
Total cash flow from operating activities		49,045		- 17,229
Cash flow from investing activities				
Investments in tangible fixed assets (-/-)	- 28,654		- 30,298	
Disinvestments in tangible fixed assets	16		- 56	
Investments in intangible fixed assets (-/-)	-23		- 2,020	
Disinvestments in intangible fixed assets	123		-	
Investments in participating interests and/or joint ventures (-/-)			-	
Investment grants received in advance	863		3,500	
Movements in loans (-/-)	-		-	
Other investments in FVA (-/-)	39		- 12	
Total cash flow from investing activities		-27,636		- 28,886
Cash flow from financing activities				
Newly taken loans	-		-	
Repayments on long-term liabilities (-/-)	-		-	
Total cash flow from financing activities		-		-
Other balance sheet movements	-	-	-	-
Movement in liquid assets		21,409		- 46,115
Balance at start of fiscal year	60,401		106,516	
Balance at end of fiscal year	81,810		60,401	
Movement in liquid assets	21,409		- 46,115	

7 Notes to the balance sheet

ASSETS

1.1.1	Intangible fixed assets	Purchase price	Cumulative depreciation	Carrying amount	Investments	Taking into use	Disinvestments	Depreciation	Other decreases in value +/-	Purchase price	Cumulative depreciation + Other downward value adjustment	Carrying amount
		01-01-2022	01-01-2022	01-01-2022	2022	2022	2022	2022	2022	12-31-2022	12-31-2022	12-31-2022
		x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000
1.1.1.1	Costs of research and development	5,009	1,141	3,868	23	-	-	649	- 1	5,032	1,789	3,243
1.1.1.2	Concessions, licenses and intellectual property rights	-	-	-	-	-	-	-	-	-	-	-
1.1.1.3	Goodwill	-	-	-	-	-	-	-	-	-	-	-
1.1.1.4	Prepaid on intangible fixed assets	124	-	124	-	-	-	-	124	124	124	-
1.1.1.5	Other intangible fixed assets	1,463	1,463	-	-	-	-	-	-	1,463	1,463	-
	Intangible fixed assets not used in operations	-	-	-	-	-	-	-	-	-	-	-
	Intangible fixed assets	6,596	2,604	3,992	23	-	-	649	123	6,619	3,376	3,243

The intangible fixed assets are the capitalized costs of the acquisition of software, website, promotional films and a new finance system.

The investment in intangible fixed assets (€23k) relates to the new finance system.

1.1.2	Tangible fixed assets	Purchase price	Cumulative depreciation	Carrying amount	Investments	Taking into use	Disinvestments	Depreciation	Other decreases in value +/-	Purchase price	Cumulative depreciation + Other downward value adjustment	Carrying amount
		01-01-2022	01-01-2022	01-01-2022	2022	2022	2022	2022	2022	12-31-2022	12-31-2022	12-31-2022
		x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000
1.1.2.1	Buildings	214,575	88,489	126,086	369	10	-	8,114	-	214,954	96,603	118,351
1.1.2.2	Land	3,053	-	3,053	-	-	-	-	-	3,053	-	3,053
1.1.2.3	Inventory and equipment	106,565	84,450	22,115	3,491	3,278	16	5,619	1	113,318	90,070	23,248
1.1.2.4	Other tangible fixed assets	9,618	8,525	1,093	190	3,474	-	479	- 1	13,282	9,003	4,279
1.1.2.5	Tangible fixed operating assets under development and prepayments on tangible fixed assets	17,228	-	17,228	25,239	- 6,762	-	-	-	35,705	-	35,705
1.1.2.6	Tangible fixed assets not in service to operations	-	-	-	-	-	-	-	-	-	-	-
	Tangible fixed assets	351,039	181,464	169,575	29,289	-	16	14,212	-	380,312	195,676	184,636

The investments in tangible fixed assets in 2022 amounted to €29,289k and can be specified as follows:

- Investment in Buildings, €369k, mainly at ASTRON and SRON;
- Investment in Inventory and Equipment, €3,491k;
of which Inventory €388k; Equipment €2,006k (mainly ARCNL, Nikhef and NIOZ) and Computer equipment €1,097k, of which €438k at SRON;
- Investment in Tangible fixed operating assets under development and prepayments on Tangible fixed assets, €35,705k, of which €25,833k relates to the Nikhef renovation and €8,096k to the fleet replacement at NIOZ.

The depreciation amounts to €14,212k, (2021: €12,617k), whereby the depreciation on Buildings is €8,114k (2021: €6,832k) and Inventory and equipment €5,619k. The depreciation on Other tangible fixed assets amounts to €479k, which mainly relates to the research fleet at NIOZ. At year-end 2022, the tangible fixed assets amounted to €184,636k, therefore increasing by €15,061k.

Land

Ownership

NWO-I owns the following lots of land:

- Landsdiep 4 and Zuider Haaks 5 and 7 in Den Hoorn (Texel, section P, number 704)
The main building of NIOZ is located on this lot.
- Korringaweg 7 in Yerseke (Reimerswaal, section Y, number 869 (previously 407))
The branch location of NIOZ is located on this lot.
- Oude Torenstraat 39 in Yerseke, (Yerseke, section G, number 6808)
The guest accommodation of NIOZ is located on this lot.
- Veenschapsweg 10 in Schoonebeek (Schoonebeek, section C, number 5183)
This lot contains LOFAR station RS208.

Ground lease

NWO-I is leaseholder of the following lots:

- Science Park 104 in Amsterdam (Watergraafsmeer, section B, number 5192 (created from 5057))
AMOLF is located on this lot. The ground lease ends on November 30, 2060.
- Science Park 105 and 107 in Amsterdam (Watergraafsmeer, section B, numbers 5054 and 5055)
Nikhef and the UvA are located on this lot. The ground lease ends on November 30, 2060.
- Science Park 108 in Amsterdam (Watergraafsmeer, section B, number 5187 (created from 5106))
This lot contains the PiMu laboratory building that is used by Nikhef as of June 1, 2019.
The ground lease ends on December 31, 2023.
- Science Park 123 in Amsterdam (Watergraafsmeer, section B, number 4046)
CWI is located on this lot. The ground lease ends on December 31, 2023.
- Science Park in Amsterdam (Watergraafsmeer, section B, number 5188 (created from 5106))
There is no building on this lot. The ground lease ends on December 31, 2023.
- Science Park in Amsterdam (Watergraafsmeer, section B, number 5189 (created from 4876))
There is no building on this lot. The ground lease ends on December 31, 2023.
- Niels Bohrweg 4 in Leiden (Leiden, section X, number 4620)
The new building for SRON was built on this lot. SRON's completion and relocation took place in mid-2021.
The ground lease is perpetual.
- Oude Hoogeveensedijk 4 in Dwingeloo (Dwingeloo, section E, numbers 1560 and 1602)
The main building of ASTRON is located on this lot. The ground lease ends on January 31, 2042.
- Schattenberg 1 and 2 in Zwiggelte (Westerbork, section A, numbers 2957 and 3131)
A total of 12 parabolic antennas of ASTRON, the Westerbork Synthesis Radio Telescope (WSRT), 2 of which are mobile, are located on these lots. There is also a service building and some other structures (including a shed, dwelling house and garage boxes). The ground lease ends for both lots on January 31, 2026.
- Halkenbroeken in Aa en Hunze (Rolde, section T, number 1661)
Two more mobile radio telescopes are located at number 1661, about 1.5 kilometers eastward from the 12 antennas in Zwiggelte. The ground lease ends on January 31, 2026.

- De Zaale 20 in Eindhoven (Tongelre, section D, number 1197 (partial)).
DIFFER is located on this lot. The ground lease ends on September 11, 2063.

The land of NIOZ Haven is leased from the Municipality of Texel. Consequently, NIOZ Haven is a subsidiary of NIOZ Holding and is not directly incorporated within the NWO-I Foundation.

The "Watergraafsmeer, section B, number 4045" lot at Science Park in Amsterdam is held in leasehold by Stichting SURF and concerns the WCW building section Z (including Conference rooms, Boiler house and small area with CWI and Nikhef offices). This lot is subject to an easement for use by CWI, Nikhef and Stichting Beheer WCW. The ground lease ends on December 31, 2023.

Rights of superficies and user agreements

ASTRON has concluded 34 rights of superficies, including for the LOFAR antennas, other outdoor stations, cables and pipelines. ASTRON also has 4 land user agreements, for the construction, use and maintenance of infrasound sensors. NWO-I (at the time FOM) concluded a user agreement with NWO on July 22, 2014 for the Science Park, lot B 5107, Watergraafsmeer, for the units at Science Park 110. In 2021, Nikhef concluded three rights of superficies for the realization and use of drilling and inspection wells, including related electrical/instrument cabinets, measurement sensors, cabling and pipelines and associated work areas.

Buildings

The buildings owned by NWO-I comprise the following locations:

- Science Park 102 in Amsterdam AMOLF
- Science Park 104 in Amsterdam AMOLF
- Science Park 105 in Amsterdam Nikhef (main building)
- Science Park 107 in Amsterdam Nikhef (used by University of Amsterdam)
- Science Park 108 in Amsterdam Nikhef (laboratory building)
- Science Park 110 in Amsterdam Nikhef (office building; portacabins)
- Oude Hoogeveensedijk 4 in Dwingeloo ASTRON
- Oude Hoogeveensedijk 6 in Dwingeloo ASTRON
- Schattenberg 1 in Zwiggelte ASTRON
- Schattenberg 2 in Zwiggelte ASTRON
- Science Park 123 in Amsterdam CWI
- De Zaale 20 in Eindhoven DIFFER
- Landsdiep 4 in Den Hoorn NIOZ
- Zuider Haaks 17c in Den Hoorn NIOZ
- Zuider Haaks 18 in Den Hoorn NIOZ
- Zuider Haaks 20 in Den Hoorn NIOZ
- Korringaweg 7 in Yerseke NIOZ
- Oude Torenstraat 39 in Yerseke NIOZ
- Niels Bohrweg 4 in Leiden SRON

The UvA wing adjoining Nikhef is owned by NWO-I. NWO-I has granted the UvA right of use until the end of the leasehold/superficies of NWO-I with NWO. The UvA is entitled to sublet.

The private sale value of the buildings was appraised in December 2015.

The insured value of all movable and immovable assets, irrespective of whether they are owned, managed, or utilized by NWO-I, as well as the movable and immovable assets for which NWO-I bears responsibility, amounts to €762,224k as of July 1, 2022. Approximately €364,036k of this amount relates to buildings.

The property valuation [WOZ-waarde] of the real estate owned by NWO-I is €116,770k (reference date January 1, 2022).

Financial fixed assets

	Carrying amount 01-01-2022	Investments and loans granted 2022	Disinvestments and loans repaid 2022	Other movements +/- 2022	Result from participating interests +/- 2022	Carrying amount 12-31-2022
	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000
1.1.3 Other participating interests	1,265	-	-	-	372	1,637
1.1.3.1 Other receivables long-term	1,142	1,000	39	19	-	2,122
1.1.3.3 Provision for irrecoverability -/-	- 408	- 1,000	-	- 19	-	- 1,427
1.1.3.3 Financial fixed assets	1,998	-	39	-	372	2,331

Other participating interests

This concerns the 100% interest in:

• Astrotec Holding BV (ATH) based in Dwingeloo	€532k
• CWI Incubator based in Amsterdam	€572k
• NIOZ Holding based in Texel, which includes NIOZ Haven BV (100%)	€520k
• Particle Physics Inside Products BV (P2IP), based in Amsterdam	€13k
• Stichting Wiskunde en Informatica Conferenties in Amsterdam (100%)	€0k

Other receivables

NWO-I provides money loans as part of the valorization of research results.

Nikhef provided 2 loans to P2IP in 2022 (totaling €1,000k) with a term until July 1, 2025. Since these loans are risk-bearing in nature, a provision of the same amount has been made for them as a matter of prudence.

In addition, the permanent advance to WCW is €504k (AMOLF (€75k), CWI (€154k) and Nikhef (€275k).

3.1 Affiliated parties

VT Model E	Mandatory disclosure	Legal form	Domicile	Code activities	Equity	Result of year	Total income	Article 2:403 of the Dutch Civil Code	Participation	Consolidation	Intra-group transactions	Liable for corporate income tax or exempt**	Equity	Result of year	Total income	
																Related parties
2022			12/31/2022	2022	2022							12/31/2021	2021	2021		
x €1,000			x €1,000	x €1,000	x €1,000	Yes/No	%	%	Yes/No*		x €1,000	x €1,000	x €1,000			
Name																
GENERAL	Werkgeversvereniging Onderzoeksinstellingen (WVOI)	Association [Vereniging]	The Hague	4	0			No	0%	0%			0			
GENERAL	Data Archiving and Networked Services			4	0			No	N/A	0%			0			
GENERAL	ESRF			4	0			No	N/A	0%			0			
ASTRON	AstroTec Holding BV	Private company [BV]	Dwingeloo	4	532	0	166	No	100%	0%	yes	CIT liable	532	-9	67	
ASTRON	Dysi Analytics	Private company [BV]	Assen	4	0	0		No	17%	0%	no	CIT liable	0			
ASTRON	Dysi Software Innovations	Private company [BV]	Visvliet	4	0	0		No	17%	0%	no	CIT liable	0			
ASTRON	Dutch Sigma	Private company [BV]	Dwingeloo	4	0	0		No	20%	0%	no	CIT liable	0			
ASTRON	Sigma Opto-Mechanics	Private company [BV]	Dwingeloo	4	0	0		No	20%	0%	no	CIT liable	0			
ASTRON	ILA Microservers	Private company [BV]	Dwingeloo	4	0	3		No	100%	0%	no	CIT liable	-3			

Continuation of table: Related parties

VT Model E	Mandatory disclosure Related parties	Legal form	Domicile	Code activities	Equity	Result of year	Total income	Article 2:403 of the Dutch Civil Code	Participation	Consolidation	Intra-group transactions	Liabe for corporate income tax or exempt **	Equity	Result of year	Total income			
					2022			12/31/2022	2022	2022						12/31/2021	2021	2021
								x €1,000	x €1,000	x €1,000	Yes/ No	%	%	Yes/ No*		x €1,000	x €1,000	x €1,000
					Name													
ASTRON	Lofar C.V.	Limited partnership [CV]	Dwingeloo	4	0	0		No	25%	0%	yes	N/A	0					
ASTRON	Stichting LOFAR	Foundation [Stichting]	Dwingeloo	4	23	-5		No	0%	0%	yes	CIT liable	28					
ASTRON	JIV-ERIC	ERIC	Dwingeloo	4	0			No	0%	0%	yes	N/A	0					
ASTRON	Stichting CAMRAS	Foundation [Stichting]	Dwingeloo	4	43			No	0%	0%	no	exempt	43	-0	10			
ASTRON	SKA Organization			4	0			No	N/A	0%	no		0					
CWI	Wiskunde en Informatica Conferenties	Foundation [Stichting]	Amsterdam	4	37	0	56	No	100%	0%	yes	CIT liable	37	3	55			
CWI	CWI Incubator	Private company [BV]	Amsterdam	4	567	323	567	No	100%	0%	no	CIT liable	244	-3	10			
CWI	DuckDB Labs	Private company [BV]	Amsterdam	4	184	100	100	No	20%	0%	no	CIT liable	84	84	95			
CWI	Fermioniq	Private company [BV]	Amsterdam	4	129	129	190	No	3%	0%	no	yes						
CWI	MonetDB	Private company [BV]	Almere	4	489	146	0	No	25%	0%	no	CIT liable	343	-42	0			
CWI	MonetDB Solutions	Private company [BV]	Almere	4	-1684	-937	543	No	5%	0%	no	CIT liable	-747	-422	871			
CWI	Spinque	Private company [BV]	Utrecht	4	0			No	20%	0%	no	CIT liable	173	120	917			
CWI	Photosynthetic	Private company [BV]	Amsterdam	4	-912	-541	88	No	30%	0%	no	CIT liable	-416	-228	4			
CWI	Stokhos	Private company [BV]	Amsterdam	4	110	-200	250	No	10%	0%	no	CIT liable	110	-200	190			
CWI	Seita Energy Flexibility	Private company [BV]	Amsterdam	4	10	5	100	No	10%	0%	no	CIT liable	5	5	83			
CWI	Dataspex	Private company [BV]	Amsterdam	4	0			No	8%	0%	no	CIT liable	12	3	39			
CWI	SWAT.holding	Private company [BV]	Amsterdam	4	728	430	0	No	25%	0%	no	CIT liable	298	175	0			
DIFFER	Coöperatieve Vereniging Milieu TU/e Campus	Cooperative Association [Coöperatieve Vereniging]	Eindhoven	4	66	29	250	No	0%	0%	yes	CIT liable	37	-41	211			
NIKHEF	Particle Physics Inside Products (P2IP)	Private company [BV]	Amsterdam	4	13	-21	0	No	100%	0%	no	CIT liable	34	-20	0			
NIKHEF	Amsterdam Scientific Instruments Holding (ASIH)	Private company [BV]	Amsterdam	4	0			No	0%	0%			0					
NIKHEF	Amsterdam Scientific Instruments	Private company [BV]	Amsterdam	4	0			No	0%	0%			0					
NIOZ	NIOZ Holding	Private company [BV]	Den Hoorn	4	519	79	0	Yes	100%	0%			440	-170				
NIOZ	NIOZ Haven	Private company [BV]	Den Hoorn	4	238	30	299	No	100%	0%			208	12	333			
NIOZ	European Polar Board			4	0			No	N/A	0%			0					
NWO-I	Stichting Netherlands eScience Center	Foundation [Stichting]	Amsterdam	4	0			No	N/A	0%			0					
NWO-I	Coöperatie SURF U.A.	Cooperative [Coöperatie]	Utrecht	4	0			No	N/A	0%			0					
NWO-I	Gemeenschappelijke regeling Darwin Centrum voor Biogeologie	Joint Arrangement [Gemeenschappelijke regeling]		4	0			No	N/A	0%			0					
NWO-I	Stichting Beheer Wetenschappelijk Centrum Watergraafsmeer (WCW)	Foundation [Stichting]	Amsterdam	4	0			No	0%	0%			0					
NWO-I	European and Developing Countries Clinical Trials Partnership			4	0			No	N/A	0%			0					
NWO-I	SV-HFML	Joint ventures		4	0			No	N/A	0%			0					
SRON	Covenant Netherlands Space Office			4	0			No	N/A	0%			0					
					1,092	-430	2,609				0		1,462	-733	2,885			

** Corporate income tax liable or exempt: if exempt, attach document from tax authorities.

It should be noted that the annual figures as included in this table are draft figures. The end position for 2021 in this document differs slightly from the stated end position reported in the 2021 financial annual report. This is because it incorporates the definitive 2021 results, which were not known yet at that time (beginning of 2022).

Current assets

Short-term receivables

		12-31-2022	2022 budgeted	12-31-2021
		x €1,000	x €1,000	x €1,000
1.2.2	Receivables			
1.2.2.1	Accounts receivable general	9,423	6,550	9,511
1.2.2.2	Receivables from NWO	7,997	3,286	5,129
1.2.2.3	Receivables from other participating interests	1,221	170	329
1.2.2.4	Receivables from personnel	37	34	68
1.2.2.5.1	Valuation of Projects in progress NWO	14	1,813	-
1.2.2.5.2	Valuation of Projects in progress	1,197	1,900	2,169
1.2.2.6.1	Other receivables	2,166	2,528	1,568
1.2.2.6.3	Projects for businesses and grants still to be claimed	12,795	13,549	11,274
1.2.2.7.1	Taxes and social insurance contributions	1,305	230	3,528
1.2.2.8.1	Prepaid costs	7,648	5,575	22,698
1.2.2.9.1	Other prepayments and accrued income	34	81	-
1.2.2.10.1	Less: Provision for irrecoverability -/-	- 603	- 1,406	- 1,683
	Receivables	43,235	34,310	54,593

Receivables amounted to €43,235k, having decreased by €11,358k compared to 2021 (€54,593k).

The largest movements compared to 2021 concern the Receivable from NWO, (€2,868k), Taxes (-€2,223k) and Prepaid expenses (-€15,051k).

Within the accounts receivable, there are NWO accounts receivable, Accounts receivable with associated participating interest and Trade receivables according to the specification below:

Breakdown	12-31-2022			12-31-2021		
	NWO	Group company	Third parties	NWO	Group company	Third parties
	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000
1.2.2.1 Accounts receivable general	592	-	8,831	952	-	8,559

Valuation of Projects in progress

	12-31-2022	2022 budgeted	12-31-2021
	x €1,000	x €1,000	x €1,000
1.2.2.5.1 Valuation of Projects in progress			
Realized billable costs NWO	14		-
Expected losses -/-	-		-
Invoiced installments -/-	-		-
Valuation of Projects in progress NWO	14	1,813	-
1.2.2.5.2 Realized billable third-party costs	3,636		6,747
Expected losses -/-	-		-
Invoiced installments -/-	- 2,439		- 4,577
Valuation Projects in progress (third parties)	1,197	1,900	2,169
Valuation of Projects in progress	1,212	3,713	2,169

The balance of the valuation of projects in progress with a debit position involves research projects for which the research costs at year end exceed their invoiced installments. On balance, a net amount remains to be claimed from the relevant financiers.

Only at SRON (€1,212k) a position of Projects in Progress remains.

Other receivables

	12-31-2022	2022 budgeted	12-31-2021
	x €1,000	x €1,000	x €1,000
1.2.2.6.1 Other receivables third parties	2,166	2,528	1,568
1.2.2.6.2 Other receivables affiliated parties	-	-	-
1.2.2.6.3 Advances on grant projects for third parties	12,795	13,549	11,274
Other receivables	14,961	16,077	12,843

Other receivables amounted to €14,961k and increased by €2,118k, of which €1,521k were higher Advances on grant projects (of which ASTRON €1,189k and NIOZ €438k).

The Taxes and social insurance contributions amount to €1,305k and are €2,223k lower than year-end 2021, which includes an increase at SRON (€2,170k), relating to a tax refund in connection with the new construction of the building in Leiden.

	12-31-2022	2022 budgeted	12-31-2021
	x €1,000	x €1,000	x €1,000
Provision for irrecoverability			
1.2.2.10.1 Balance as at January 1	- 1,682		- 1,495
1.2.2.10.2 Withdrawal (+/+)	1,120		- 57
1.2.2.10.3 Allocation (-/-)	41		130
1.2.2.10 Less: provision for irrecoverability	- 603	- 1,406	- 1,682

The provision for irrecoverability amounted to €603k, of which €201k at AMOLF and €402k at Nikhef.

Liquid assets

	12-31-2022	2022 budgeted	12-31-2021
	x €1,000	x €1,000	x €1,000
1.2.3.1 Cash	20	8	19
1.2.3.2 Bank account balances	317	128	821
1.2.3.3 Current account balance Treasury banking	81,473	51,197	59,561
Liquid assets	81,810	51,333	60,401

Liquid assets consist of cash and bank balances and are freely available to the institution with the exception of €412k;

- Of this, €290k relates to the bank guarantee for the rent of a building at the Science park in Amsterdam and a bank guarantee of €122k which was given to the Tax Authorities/Customs.
- The intraday limit at ABN-AMRO Bank is €10,200k.

The liquid assets increased in 2022 by €21,409k from €60,401k to €81,810k. This increase arises from:

- operational activities (€49,045k)
- Investing activities (-€27,636k)

Cash flow from operating activities resulted on balance in an increase in liquidity of €49,045k, mainly due to the net income and expenditure adjusted for depreciation and provisions (€35,948k), an increase in Receivables (€11,358k) and an increase in Liabilities (€306k).

The cash flow from investing activities concerns the investments in (in)tangible fixed assets (€28,538k), less the receipt of the investment grant of €863k, plus the other investments in Financial Fixed Assets (€39k).

Liabilities

Equity

2.1.1		Balance as at 01-01-2021	Result +/- 2021	Other movements +/- 2021	Balance as at 12-31-2021
		x €1,000	x €1,000	x €1,000	x €1,000
2.1.1.1	General reserve	721	- 62	-	658
2.1.1.2	Legal reserve	-	-	-	-
2.1.1.3	Earmarked reserve (public)	89,607	- 3,771	3	85,797
2.1.1.3	Earmarked reserve (private)	-	-	-	-
2.1.1.4	Earmarked fund (public)	2,043	- 693	-	1,396
2.1.1.5	Earmarked fund (private)	-	-	-	-
2.1.1.6	Revaluation reserve	-	-	-	-
2.1.1.7	Other legal reserves	2,254	1,738	-	3,992
2.1.1.8	Reserves under the articles	-	-	-	-
2.1.2	Third-party share	-	-	-	-
	Equity	94,625	- 2,788	3	91,843

2.1.1		Balance as at 01-01-2022	Result +/- 2022	Other movements +/- 2022	Balance as at 12-31-2022
		x €1,000	x €1,000	x €1,000	x €1,000
2.1.1.1	General reserve	658	7,158	-	7,816
2.1.1.1a	Legal reserve	-	-	-	-
2.1.1.2	Earmarked reserve (public)	85,797	17,515	-	103,312
2.1.1.3	Earmarked reserve (private)	-	-	-	-
2.1.1.4	Earmarked fund (public)	1,396	- 209	-	1,187
2.1.1.5	Earmarked fund (private)	-	-	-	-
2.1.1.6	Revaluation reserve	-	-	-	-
2.1.1.7	Other legal reserves	3,992	- 749	-	3,243
2.1.1.8	Reserves under the articles	-	-	-	-
2.1.2	Third-party share	-	-	-	-
	Equity	91,843	23,715	-	115,558

The movements in Equity are the movements based on the appropriation of the net result in 2022. Equity increased from €91,843k at the end of 2021 to €115,558k at the end of 2022.

The general reserves increased by €7,158k to €7,816k, due to the Sale proceeds from the SRON premises in Utrecht.

The earmarked reserve increased by €17,515k to €103,312k in 2022.

The earmarked reserve is intended for, among other things:

- specific financial risks (to be specified and approved by Foundation Board), such as the OCW Coronavirus Fund granted in [...] (€4,756k), the NWA Coronavirus Fund granted in 2021 (€815k) and the Coronavirus Fund granted in 2020 (€6,000k),
- depreciation charges of buildings, building-related installations (as long as there is no maintenance plan for the buildings) and infrastructure investments
- the mismatch in time between operating grants for new construction and renovation and the associated expenses (in particular, the new SRON building and renovation of Nikhef)
- buffer capital without specific allocation.

The earmarked public funds decreased by €209k to €1,187k. The remaining balance of earmarked funds consists mainly of the sector plan funds within the BUW (€1,169k).

	Balance as at 01-01-2022	Newly granted 2022	Result +/- 2022	Other movements +/- 2022	Balance as at 12-31-2022
	x €1,000		x €1,000	x €1,000	x €1,000
<i>Earmarked fund (public)</i>	-	-	-	-	-
Sector plan	1,350		- 181		1,169
Einstein telescope	78		- 60		18
Earmarked fund (public)	1,428	-	- 241	-	1,187

The Other legal reserves were compulsorily formed as of 2020 for the capitalization of research and development costs in relation to the investment in the New Finance System.

Foundation capital

The foundation capital is €45.38.

Provisions

		Balance as at 01-01-2022	Allocations 2022	With- drawals 2022	Release 2022	Interest movement (for present value) 2022	Balance 12-31-2022	Short-term portion < 1 year	Long-term portion > 1 year
		x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000
2.2	Provisions								
2.2.1	Personnel provisions	7,265	2,861	- 1,665	- 1,344	- 675	6,442	2,537	3,905
2.2.2	Provision for loss-making contracts	-	-	-	-	-	-	-	-
2.2.3	Other provisions	3,033	980	-	-	- 984	3,029	-	2,919
	Provisions	10,298	3,841	- 1,665	- 1,344	- 1,659	9,471	2,537	6,824
Breakdown of Personnel-related provisions									
2.2.1.1	Provision for social policy, reorganizations and other legal status	932	-	- 83	- 75	- 5	768	59	709
2.2.1.2	Leave savings and sabbatical leave	-	-	-	-	-	-	-	-
2.2.1.3	Own risk WGA	-	-	-	-	-	-	-	-
2.2.1.4	Provision for long-service awards	981	316	- 97	- 29	- 222	948	110	838
2.2.1.5	Unemployment contributions	2,023	341	- 414	- 629	- 262	1,059	517	542
2.2.1.6	Long-term sick	224	966	- 153	- 49	- 32	957	676	281
2.2.1.7.1	Transition payments	1,738	819	- 556	- 320	- 63	1,618	804	814
2.2.1.7.2	Generation Plan	987	385	- 329	- 180	- 83	781	308	473
2.2.1.7.3	Other personnel provisions	380	35	- 35	- 62	- 8	311	63	248
	Total personnel provisions	7,265	2,861	- 1,665	- 1,344	- 675	6,442	2,537	3,905

The provisions decreased by €827k to €9,471k.

Personnel-related provisions

The Provision for social policy, reorganizations and other legal positions amounts to €768k and mainly concerns the reorganization provision, which was set up to cover future salary costs of redundant employees.

The Long-service provision amounts to €948k and relates to future obligations to employees in respect of bonuses based on the current CLA.

Unemployment contributions amounted to €1,059k. The provision decreased by €964k.

The allocation for 2022 amounted to €316k, for several employees running through 2031. The withdrawal amounted to €414k and the release amounted to €629k. The interest movement present value amounted to €262k.

Long-term sick

In case of illness, NWO-I is obligated to continue paying employees 100% of their salary during the first year and 70% during the second, or 85% in case of sufficient reintegration. Pursuant to DAS 271, a provision has been created for the future salary costs of employees who are sick as of the reporting date and for whom it is fairly certain that they will not return to work or will not return to work in full.

The liability is calculated as the present value of future salary payments and transition payments. This provision was created as of 2019 and amounted to €957k at the end of 2022.

Transition payment under the Work and Security Act

NWO-I employees who, after temporary employment, do not leave voluntarily are entitled to a transition payment in accordance with the Work and Security Act and the supplementary Balanced Labor Market Act.

As a result of amended legislation (Balanced Labor Market Act), as of January 1, 2020, a provision must be created for all temporary employees, regardless of the period of their employment. This provision decreased by €120k on balance in 2022. The provision at year-end 2022 was €1,618k (2021: €1,738k).

Generation Plan

This provision for future payments to current participants of the Generation Plan for Research Institutions is based on a calculation of the rights accrued by employees up to the end of the year. This exclusively concerns the rights of employees who are actually using the scheme as of the balance sheet date. The scheme came into effect for the first time with the 2018-2019 CLA for Research Institutions. The balance at year-end 2022 was €781k. The provision was mainly formed at ASTRON (€195k), NIOZ (€185k) and SRON (€254k).

The other provisions within the personnel provisions concern a contribution to the salary costs for employees who have transferred to other employment as a result of the transition (term of 5 years starting January 1, 2017). Furthermore, it also relates to a provision made in 2012 for SRON's contribution to the Euclid project, which contributed in part to the successful launch of the James Webb Telescope on December 25, 2021 (term through 2023). The balance at the end of 2022 was €311k.

Other provisions

The item Other provisions within Provisions includes the Provision for remediation of radioactive materials PiMu. The provision at the end of the reporting year was €3,029k.

The basement of the PiMu building, located on a lot at the Amsterdam Science Park which NWO-I holds in ground lease until the end of 2023, contains radioactivity that arose in the 1980s. NWO-I has an obligation to ensure proper disposal of the radioactive materials prior to termination of the ground lease. The cost of removal will be equally shared between NWO-I and landowner NWO. In 2016, the required scope of the total provision was determined and the provision was immediately recognized in its entirety in the 2016 fiscal year.

The provision was revised in 2022. The provision is based on reports from external expert parties. An estimation uncertainty exists in the amount, because it will not be known how much radioactivity is still present and what the actual cost will be until the actual removal takes place. In accordance with DAS 252, the NWO contribution has been deducted from the expenses. Short-term receivables include the NWO contribution of €1,530k (€1,264k excl. VAT) as receivable from NWO.

Long-term liabilities

	Balance as at 01-01-2022	Loans contracted	Repayments	Balance as at 12-31-2022	Term > 1 year	Term > 5 years
	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000
2.3.1 Amounts owed to group companies (NWO)	-	-	-	-	-	-
2.3.2.1.1 Long-term loans other	-	-	-	-	-	-
2.3.2.1.2 Investment grants received in advance	79,403	863	- 6,031	74,235	67,698	50,889
2.3.2.1.1 Long-term liabilities NWO consolidation	-	-	-	-	-	-
Long-term liabilities	79,403	863	- 6,031	74,235	67,698	50,889

The balance of long-term liabilities concerns the investment grant received from NWO in advance, being the pre-financing of new construction and renovation projects. In 2022, an amount of €863k was received from the Quantum Delta Growth Fund. These funds were released to cover depreciation on equipment purchased with this for AMOLF's Nanolab. The redemption relates to the shift from long-term to current liabilities. There is also a Conditional right provided by NWO for the Housing New Construction Leiden. At the end of the year under review, this right still amounted to €36,192k.

Current liabilities

	12-31-2022	2022 budgeted	12-31-2021
	x €1,000	x €1,000	x €1,000
2.4.1 Amounts owed to NWO	41,567	35,637	37,592
2.4.2 Amounts owed to other participating interests	-	-	110
2.4.3 Amounts owed to credit institutions	-	-	-
2.4.5 Amounts owed to Ministry of Finance	-	-	-
2.4.6 Amounts owed to municipalities and Joint Arrangements	-	-	-
2.4.7 Pre-invoiced installments Projects	516	1.200	2,094
2.4.8 Accounts payable	5,589	12,275	6,629
2.4.9 Taxes and social insurance contributions	7,774	6,140	7,821
2.4.10 Pensions	1,792	1,400	1,846
2.4.11 Liabilities in respect of work for third parties	-	-	-
2.4.12 Other	9,638	7,333	8,845
2.4.15 Investment grants Received in advance (short-term)	6,024	4,786	6,244
2.4.16 Amounts received in advance	1,947	1,703	1,479
2.4.17 Vacation pay and days	13,569	12,439	13,963
2.4.18 Interest payable	-	-	-
2.4.19 Other accrued liabilities	27,576	23,193	22,394
Current liabilities	115,991	106,106	109,016

The total of current liabilities is €115,991k and has increased by €6,975k.

The current liabilities balance takes into account the effects of a recently conducted EU audit. The total effect of this is €1,000k, which involved an entry of €640k under Grants received in advance (current) and €360k under Other accrued liabilities. Income on EU contracts has been deducted from this amount.

Pre-invoiced installments Projects

	12-31-2022	2022 budgeted	12-31-2021
	x €1,000	x €1,000	x €1,000
Realized billable third-party costs	- 2,901		- 1,510
Expected losses -/-	100		279
Invoiced installments -/-	3,317		3,325
2.4.3.1.2 Valuation pre-invoiced third parties	516	1,200	2,094

The item Pre-invoiced installments Projects relates to research projects for which the invoiced installments at the end of the year under review exceed the realized research costs.

Compared to 2021, the balance decreased by €1,578k.

Accounts payable

	12-31-2022	2022 budgeted	12-31-2021
	x €1,000	x €1,000	x €1,000
2.4.8 Accounts payable	5,589	12,275	6,629

Taxes and social insurance contributions

	12-31-2022	2022 budgeted	12-31-2021
	x €1,000	x €1,000	x €1,000
2.4.9.1 Payroll taxes	6,642	5,750	6,748
2.4.9.2 Turnover tax	1,132	390	1,073
2.4.9.3 Social insurance contributions	-	-	-
2.4.9.4 Other taxes	-	-	-
Taxes and social insurance contributions	7,774	6,140	7,821

- 2.4.15 Investment grants received in advance (short-term)
Decrease relative to 2021 of €220k.
These grants are updated annually for coverage on depreciation costs.
- 2.4.19 Other accrued liabilities are the items Other accrued liabilities and Third-party grant projects, according to the specification below:

Accrued liabilities

	12-31-2022	2022 budgeted	12-31-2021
	x €1,000	x €1,000	x €1,000
2.4.19 A Other accrued liabilities	37	10,797	99
2.4.19 B Grant projects received in advance (credit)	27,539	12,396	22,295
Other accrued liabilities	27,576	23,193	22,394

The Other accrued liabilities increased by €5,182k, which mainly relates to Grant projects received in advance (credit). This item fluctuates annually depending on the projects honored, the installment receipts and expenses incurred in a fiscal year.

Notes on Balance Sheet versus Budget

The balance sheet total is €315,256k, which is €16,225k higher than the budgeted balance sheet total.

Below is a brief summary of the main points.

Assets

Fixed assets, €23,177k less than budgeted.

- €23,605k Tangible fixed assets, of which
 - €22,907k NIOZ Fleet replacement, realization later than budgeted.
- Current assets €39,402k more than budgeted, of which
 - +€8,925k Receivables, especially at CWI, Nikhef and NIOZ.
 - +€30,477k Liquid assets, mainly due to later realization of budgeted capital expenditures.

Liabilities

- Equity, €37,213k more than budgeted,
 - which is partly explained by the difference with respect to the budgeted result of negative €3,714k, while a positive result of €23,715k was realized.
- Provisions €1,593k less than budgeted,
 - Which is partly explained by the valuation of the Provisions at present value, while in the budget these were valued at nominal value, impact of this amounts to €675k).
- Long-term liabilities, €29,280k less than budgeted,
 - The budget included a loan of €26,000k to (partially) finance the fleet replacement of NIOZ, the New SRON building, the Renovation of the boiler house WCW (CWI/Nikhef) and the renovation of Nikhef. This loan will be effectuated in the future, the private loan (€120,000k) with NWO was signed on December 22, 2022.
- Current liabilities, €9,885k more than budgeted,
 - Particularly at AMOLF, CWI and SRON, relating to accounts payable, debts to group companies and Project funds received in advance.

Off-balance sheet rights and liabilities

Off-balance sheet rights (amounts x €1,000)	12-31-2021	Move- ments	12-31-2022	< 1 year	2 to 5 years, inclusive	From 5 years onward	Total
1. Contingent liabilities and unrecognized liabilities							
a) Claims submitted by third parties	10	(10)	-	-	-	-	-
b) Guarantees and sureties, etc., issued	13,776	(596)	13,180	1,187	4,679	7,314	13,180
c) Liabilities from orders for tangible fixed assets	1,242	75,678	76,920	14,638	62,282	-	76,920
d) Other off-balance sheet liabilities	10,822	(3,527)	7,295	3,457	3,133	705	7,295
Future liabilities	-	-	-	-	-	-	-
Fiscal unit for VAT NWO and NWO-I	-	-	-	-	-	-	-
TOTAL contingent liabilities and unrecognized liabilities	25,850	71,545	97,395	19,282	70,094	8,019	97,395
2. Long-term financial liabilities							
a) Rights of use and other rights (ground lease, superficies, rental, lease and leasing)	4,470	(40)	4,430	1,042	1,746	1,642	4,430
b) Obligations under cooperative arrangements and potential risks of financial setbacks arising from these obligations	128	4,858	4,986	2,557	2,429	-	4,986
TOTAL Long-term financial liabilities	4,598	4,818	9,416	3,599	4,175	1,642	9,416
TOTAL Off-balance sheet liabilities	30,448	76,363	106,811	22,881	74,269	9,661	106,811
Off-balance sheet rights							
(amounts x €1,000)	12-31-2021	Move- ments	12-31-2022	< 1 year	2 to 5 years, inclusive	From 5 years onward	Total
1. Contingent rights and unrecognized rights							
a) Claims submitted to third parties	-	-	-	-	-	-	-
b) Other	41,926	(955)	40,971	1,722	6,328	32,921	40,971
TOTAL Off-balance sheet rights	41,926	(955)	40,971	1,722	6,328	32,921	40,971

The amounts included in the statement of off-balance sheet rights and liabilities and the notes thereto are stated at nominal value excluding VAT. In general, VAT increases the costs for NWO-I.

Contingent liabilities and unrecognized liabilities

Claims submitted by third parties

Claims submitted by third parties decreased by €10k compared to 2021.

The Nikhef renovation resulted in claims from the contractor. These are still under discussion.

Guarantees and sureties issued, etc.

Compared to 2021, the liability decreased by €596k, which included an expiration of the €597k ARCNL lease agreement. The lease obligation at ARCNL with the effective date being the date of handover and a term until December 31, 2033 amounts to €12,867k at the end of the reporting year.

A bank guarantee was also issued for ARCNL in the amount of €286k.

For NWO-I's office building in Utrecht and for facility support provided by NWO, the associated annual obligation is paid to NWO. In return, NWO-I is entitled to an annual grant from NWO of the same size as the obligation (€900k). Since the obligation and right are identical and involve the same legal entities, they are not included in the overview above.

Liabilities from orders for tangible fixed assets

Compared to 2021, the liability increased on balance by €75,678k, of which €6,691k relates to the Wim Wolff fleet replacement and €68,800k relates to the Anna Weber-van Bosse fleet replacement.

Other off-balance sheet liabilities

Compared to 2021, the liability decreased by €3,527k, of which €4,145k relates to obligations for orders at Nikhef.

Future liabilities

For 2021 and beyond, NWO-I has committed by means of awards for projects as far as the BUW is concerned.

Furthermore, NWO-I holds multiple commitments to provide financial contributions to partnerships.

NWO-I's personnel is its largest asset. NWO-I therefore has liabilities for its personnel as well, both when it comes to permanent and temporary staff. All of these liabilities result from NWO-I's normal business operations and are covered from the grant contributions from NWO and contracts concluded with third parties.

Grants awarded are subject to specific grant conditions. Upon completion of a project, account must be rendered with the inherent risk that the grantor may lower the grant awarded if specific conditions have not been satisfied. The risk cannot be quantified.

Fiscal unit for VAT NWO and NWO-I

On September 28, 2017, the request was submitted to the Tax Authorities for a fiscal unit for VAT between NWO and NWO-I as of January 1, 2017. Although formal confirmation has not yet been received, the financial statements from 2018 onward have assumed that the fiscal unit for VAT is established.

A consequence of a fiscal unit is that NWO-I becomes (jointly and severally) liable for the tax debts of this fiscal unit as a whole.

Long-term financial liabilities

Rights of use and other rights

Compared to 2021, 17 user and other rights were updated for a total of €40k.

Liabilities under cooperative arrangements and potential risks of financial setbacks arising from these liabilities

As contained in the board report, NWO-I recognizes the risk resulting from undesired obligations to third parties. The risk cannot be quantified.

The currently known liabilities increased by €4,858k compared to 2021, which are entirely for the account of the ILT upgrade LOFAR 2.0/Duplio at ASTRON.

Off-balance sheet rights

Contingent rights and unrecognized rights

- a Claims submitted to third parties
- No position

- b Other

Compared to 2021, this decreased by €955k, which includes an increase of €600k pertaining to the LNHV and a decrease of €1,392k relating to the Housing New Construction Leiden. NWO provides SRON/NWO-I with an annual grant as an unearmarked basic grant and this grant must be recognized 100% as income and therefore this item automatically goes via the statement of income and expenditure to the earmarked reserve in equity (Annually until 2048).

In accordance with DAS 252, the amounts included in the statement of 'Off-balance sheet rights and liabilities' must be recognized at present value, if the effect of the time value of money is material. Taking into account the currently prevailing interest rates, the calculation showed that the effect of this for the Off-balance sheet liabilities is therefore €9,914k lower and for the Off-balance sheet rights €11,959k lower.

Off-balance sheet rights (amounts x €1,000)	12-31-2022	< 1 year	2 to 5 years, inclusive	From 5 years onward	Total	Check
1. Contingent liabilities and unrecognized liabilities						
a) Claims submitted by third parties	-	-	-	-	-	-
b) Guarantees and sureties, etc., issued	11,194	1,157	4,272	5,764	11,194	11,194
c) Liabilities from orders for tangible fixed assets	1,377	1,040	337	-	1,377	1,377
d) Other off-balance sheet liabilities	84,054	15,467	67,980	607	84,054	84,054
Future liabilities	-	-	-	-	-	-
Fiscal unit for VAT NWO and NWO-I	-	-	-	-	-	-
TOTAL Contingent and unrecognized liabilities	96,624	17,664	72,589	6,372	96,624	96,624
2. Long-term financial liabilities						
a) Rights of use and other rights (ground lease, superficies, rental, lease and leasing)	3,801	1,016	1,609	1,176	3,801	3,801
b) Obligations under cooperative arrangements and potential risks of financial setbacks arising from these obligations	4,797	2,492	2,304	-	4,797	4,797
TOTAL Long-term financial liabilities	8,597	3,508	3,913	1,176	8,597	8,597
TOTAL Off-balance sheet liabilities	105,222	21,172	76,502	7,548	105,222	105,222
Off-balance sheet rights (amounts x €1,000)	12-31-2022	< 1 year	2 to	< 1 year	From 5 years onward	Total
1. Contingent rights and unrecognized rights						
a) Claims submitted to third parties	25,486	1,357	5,074	19,055	25,486	25,486
b) Other	3,526	322	704	2,501	3,526	3,526
TOTAL Off-balance sheet rights	29,012	1,679	5,777	21,556	29,012	29,012

In addition to the off-balance sheet rights and liabilities, NWO-I entered into a loan agreement with NWO on December 20, 2022. The principal amount is €120,000k, which is intended for the (partial) financing of the NIOZ fleet replacement, the New SRON building, the Renovation of the WCW boiler house (CWI/Nikhef) and the renovation of Nikhef. The loan will be disbursed in tranches upon request or based on the financing requirement.

When requested, the financing requirement will be substantiated with verifying documents, such as an investment progress report and an up-to-date liquidity forecast. The term of the loan is 30 years, with the interest rate set at 2.21% for the entire term of the loan and based on the published interest rate for 30 years treasury banking.

8 Notes to the statement of income and expenditure

INCOME

Income

	2022	2022 Budgeted	2021
	x €1,000	x €1,000	x €1,000
3.1 State contributions	154,683	143,960	136,772
3.2 Other government contributions and grants	682	49	1,850
3.4 Income from work for third parties	73,226	69,337	70,897
3.5 Other income	14,403	6,674	6,551
Total income	242,994	220,020	216,069

State contributions

	2022	2022 Budgeted	2021
	x €1,000	x €1,000	x €1,000
3.1 State contributions	154,683	143,960	136,772
3.1.1 State contributions from OCW via NWO	133,642	126,082	120,674
3.1.2 Other grants from OCW via NWO	21,041	17,878	16,098
State contributions	154,683	143,960	136,772

The total State contributions amount to €154,683k and are €17,911k higher than the position at year-end 2021. The increase in this income is caused by allocations for the NWO-I Maintenance Fund and the NWO-I Development Fund, and for the costs of the NWO-I Office, (totaling €7,000k), Wage and price compensation (totaling €4,600k), Energy compensation (€1,700k) and some contributions (totaling €4,611k).

Government contributions/grants from other authorities

	2022	2022 Budgeted	2021
	x €1,000	x €1,000	x €1,000
3.2.2.1 Provincial contributions and grants	127	-	83
3.2.2.2 Other Municipal and Joint Arrangement contributions and grants	- 14	-	14
3.2.2.3 Other authorities	569	49	1,753
Other government contributions and grants from other authorities	682	49	1,850

The other government contributions and grants from other authorities are, on the one hand, a provincial contribution from the Province of Noord-Brabant and from the Municipality and Region of Eindhoven for DIFFER (€119k) and a Municipal contribution at NIOZ €9k and, on the other, the contribution from Other authorities the Ministry of Economic Affairs (€569k).

Income from work for third parties

		2022	2022 Budgeted	2021
		x €1,000	x €1,000	x €1,000
3.4.2	Contract research	66,165	57,350	66,427
3.4.4	License revenue	-	-	-
3.4.5	Other income from work for third parties	7,061	11,987	4,470
	Income from work for third parties	73,226	69,337	70,897

The total income from work for third parties amounted to €73,226k and was €2,330k more than year-end 2021.

		2022	2022 Budgeted	2021
		x €1,000	x €1,000	x €1,000
3.4.2.1	International organizations	15,645	11,473	14,647
3.4.2.2	National authorities	5,825	3,984	6,349
3.4.2.3	NWO	28,953	27,573	29,455
3.4.2.4	KNAW	-	-	3
3.4.2.5	Other nonprofit organizations	12,135	11,243	9,677
3.4.2.6	Businesses	3,607	3,077	6,296
	Contract research	66,165	57,350	66,427

The income Contract research (€66,165k) decreased by €262k compared to 2021, which is mainly reflected in:

- the income from International Organizations (€15,645k) increased by €998k, taking into account the €1,000k effect of the EU audit, which reduced the income.
In particular at AMOLF (€907k), ARCNL (€126k), DIFFER (€752k), NSCR (€82k), NIOZ (€326k) and SRON (€256k).
- the income National governments (€4,786k) decreased €524k,
Particularly at NIOZ (€1,079k), DIFFER (€329k) and NSCR (€222k), while CWI recorded an increase (€1,074k).
- the income from NWO at year-end 2022 was €28,953k and has decreased by €502k, of which €2,772k relates to the NWO expiration of granting (2021: €11,324k).
The expiration of granting is a result of the granting commitments made by the former FOM and guaranteed by NWO.
- the income from Other Non-profit organizations (€12,135k) increased by €2,458k,
with an increase particularly at AMOLF (€881k) and NIOZ (€3,036k) and a decrease (€1,698k) at Nikhef.
- the income from Businesses (€3,607k) decreased by €2,689k.
The decrease is particularly visible at CWI (€2,641).

The BUW's income decreased because of the expiration of granting, whereby the annual contribution from NWO to fulfill the granting commitments will decrease to zero in 2024. The income for projects by NWO and third-party projects is determined by the annual expenses, and changes mainly with grants received in advance from NWO and third parties. In due course, as the projects reach completion, these items will diminish to nil as well. After all, there will be no new projects.

For the institutes, the income in these items fluctuates yearly depending on newly awarded projects and on the expenses incurred in a fiscal year, or the income is determined using the PoC method. In case of grant projects, subject to the financial progress and in case of the PoC method, the income is determined according to the progress of the respective project.

Other income

		2022	2022 Budgeted	2021
		x €1,000	x €1,000	x €1,000
3.5.1	Rental income	4,563	4,350	4,344
3.5.2	Secondment of personnel	1,195	365	1,297
3.5.3	Gifts	-	-	-
3.5.4	Sponsoring	3	-	29
3.5.9	Catering revenue	-	-	-
3.5.10	Other	8,641	1,959	882
	Other income	14,403	6,674	6,551

The character of this income, with the exception of rental income, is incidental.

Rental income

Nikhef has agreements for an indefinite period of time with over 160 parties for the use of facilities in the Nikhef data center. As a result, this has become a structural source of income for Nikhef.

This concerns income in the context of internet exchange housing and the renting out of buildings not used for research.

Other income

Other income increased by €7,852k compared to 2021, which mainly relates to the sale proceeds from the former SRON premises in Utrecht.

Notes on Income versus Budget

		2022	2022 Budgeted	2021
		x €1,000	x €1,000	x €1,000
3.1	State contributions	154,683	143,960	136,772
3.2	Other government contributions and grants	682	49	1,850
3.4	Income from work for third parties	73,226	69,337	70,897
3.5	Other income	14,403	6,674	6,551
	Total income	242,994	220,020	216,069

The total income amounted to €242,994k and was €22,974k higher than budgeted.

- The State contribution is €10,723k higher, mainly due to:
 - €4,600k Wage and price compensation
 - €1,700k Energy compensation
 - Ukraine emergency fund €1,000k
 - €3,423k Other, including €2,393k SKA and €660k SEO
- The Other government contributions and grants were €633k higher.
- Income from work for third parties was €3,889k higher, of which:
 - €7,642k at NIOZ, of which €4,652k due to an additional charter, which had not been budgeted.
- Other income was €7,729k higher, which is largely due to the proceeds from the sale of the SRON premises in Utrecht (€7,500k).

EXPENSES

Expenses

		2022	2022 Budgeted	2021
		x €1,000	x €1,000	x €1,000
4.1	Personnel expenses	139,643	134,542	139,917
4.2	Depreciation/amortization	8,499	9,609	6,830
4.3	Housing expenses	11,876	13,598	15,349
4.4	Other expenses	61,064	65,982	56,518
	Total expenses	221,083	223,731	218,614

Personnel expenses

		2022	2022 Budgeted	2021
		x €1,000	x €1,000	x €1,000
4.1	Personnel expenses	139,643	134,542	139,917
4.1.1	Wages, salaries, social insurance and pension costs	122,144	121,933	124,390
4.1.2	Other personnel expenses	17,911	12,579	15,738
4.1.3	Fees received -/-	-411	30	-211
	Personnel expenses	139,643	134,542	139,917

Breakdown

		2022	2022 Budgeted	2021
		x €1,000	x €1,000	x €1,000
	Wages and salaries			
4.1.1.1	Wages and salaries	95,045	94,960	96,241
4.1.1.2	Social insurance costs	12,015	14,006	12,302
4.1.1.3	Pension contributions	15,084	12,967	15,847
	Wages and salaries	122,144	121,933	124,390
	Other personnel expenses			
4.1.2.1	Allocations personnel provisions	-823	159	-890
4.1.2.2	Non-employee personnel expenses	7,484	3,690	5,941
4.1.2.3	Other	11,249	8,730	10,686
	Other personnel expenses	17,911	12,579	15,738
4.1.3.3	Other benefits that reduce personnel expenses -/-	-411	30	-211

The personnel expenses amounted to €139,643k and decreased by €273k compared to 2021.

- Direct personnel expenses (Wages, Salaries and Pension Expenses) decreased by €2,246k.
 - o Wages and Salaries decrease €1,196k, of which
 - an increase in the costs because of the new CLA for Research Institutions 2022-2023, whereby as of August 1, the salaries were increased 4% and a one-time payment was made for every employee who was employed on August 1
 - a decrease in staff size (71 FTE), the majority of which was at BUW.
 - o Pension contributions decrease of €764k.
- Other personnel expenses (€17,911k) increased €2,173k compared to 2021.
 - o Non-employee personnel expenses, increase €1,543k, of which
 - ASTRON (€248k), NIOZ (€431k), Office (€558k) and GENERAL (€631k). The increase at the Office is the result of hiring within the departments F&C Legal Affairs and Communications. The increase in GENERAL is the result of the temporary hiring at the expense of the Development Fund (€544k) and €150k for the NPS project.

The average number of FTE during the reporting year was 1,614, which is 71 FTE less than the average of the previous year. In particular, the BUW showed a decreasing workforce (average 62 FTE), which is in line with the expiration of the research projects within the BUW.

Average number of FTE		Primary process			Total average	2020 average	Difference
Reporting period		Management	(science)	Support			
DUBBLE			0.15	0.00	0.15	1.79	- 1.64
NWO The Hague (international payroll)			0.00	1.00	1.00	0.00	0.00
NWO-I (BUW)			53.69	0.42	54.11	116.15	- 62.04
NWO-I (DIFFER)		2.00	52.32	58.49	112.82	118.23	- 5.41
NWO-I (AMOLF)		2.00	93.64	74.55	170.19	164.45	5.74
NWO-I (ARCNL)		2.00	38.30	10.35	50.65	48.79	1.87
NWO-I (ASTRON)		2.00	54.81	119.39	176.20	181.19	- 5.00
NWO-I (Office)		1.00	0.00	36.71	37.71	40.66	- 2.95
NWO-I (CWI)		2.00	162.95	37.07	202.02	209.71	- 7.69
NWO-I (JIVE)		0.00	12.34	11.18	23.53	22.25	1.28
NWO-I (NIKHEF)		2.00	98.37	107.06	207.43	213.64	- 6.21
NWO-I (NIOZ)		2.00	186.78	146.33	335.10	318.21	16.89
NWO-I (NSCR)		2.00	44.87	8.24	55.11	56.69	- 1.58
NWO-I (SRON)		2.00	90.20	95.72	187.92	192.06	- 4.13
End total reporting period		19.00	888.42	706.51	1,613.93	1,684.80	- 70.87
End total previous year		19.00	951.33	714.47	1,684.80		
Movement		0.00	- 62.91	- 7.96	- 70.87		

Mention based on WNT

On January 1, 2013, the Senior Executives in the Public and Semi-Public Sector (Standards for Remuneration) Act (WNT) came into effect. The WNT applies to NWO-I. The maximum remuneration applicable for NWO-I was €216,000.00 (General Maximum Remuneration)

in 2022. The senior executives identified within our organization with an employment contract are not employed by any other WNT-liable institution(s) as senior executives (entered into as of January 1, 2018).

Table: Senior executives with an employment contract

See following pages.

Table 1a Senior executives with an employment contract

Amounts x €1	J.E. van der Boon	C.C.J.H. Bijleveld	S.C.M. Bentvelsen	J.W.M. Frenken	M.W. Wise
Job details	Director of operations / Interim NWO-I director	Senior researcher 1 <1>	Director Nikhef <2>	Director ARCNL <2>	Director SRON <2>
Start and end of job performance in 2022	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 06/30	01/01 - 12/31
Part-time factor in FTE	1	0.8368	1	1	1
(Notional) employment relationship?	yes	yes	yes	yes	yes
Remuneration					
Remuneration plus taxable expense allowances	€ 144,740.34	€ 114,083.49	€ 173,373.60	€ 92,587.30	€ 162,590.29
Remuneration payable over time	€ 22,383.72	€ 20,775.26	€ 23,645.76	€ 11,612.40	€ 22,828.08
Remuneration	€ 167,124.06	€ 134,858.75	€ 197,019.36	€ 104,199.70	€ 185,418.37
Individually applicable remuneration maximum	€ 216,000.00	€ 180,748.80	€ 216,000.00	€ 107,112.33	€ 216,000.00
-/- Undue amount paid					
Total remuneration	€ 167,124.06	€ 134,858.75	€ 197,019.36	€ 104,199.70	€ 185,418.37
The amount of the excess and the reason why the excess is or is not allowed	N/A	N/A	N/A	N/A	N/A

2021 data	J.E. van der Boon	C.C.J.H. Bijleveld	S.C.M. Bentvelsen	J.W.M. Frenken	M.W. Wise
Start and end of job performance in 2021	06/03 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Part-time factor 2021 in FTE	1	0.68	1	1	1
(Notional) employment relationship	yes	yes	yes	yes	yes
Remuneration plus payable expense allowance	€ 71,112.98	€ 96,513.27	€ 169,369.91	€ 155,498.55	€ 144,989.28
Remuneration payable over time	€ 12,660.13	€ 19,836.36	€ 23,305.80	€ 23,109.96	€ 22,473.24
Subtotal	€ 83,773.11	€ 116,349.63	€ 192,675.71	€ 178,608.51	€ 167,462.52
Individually applicable remuneration maximum	€ 121,391.78	€ 142,120.00	€ 209,000.00	€ 209,000.00	€ 209,000.00
Total remuneration 2021	€ 83,773.11	€ 116,349.63	€ 192,675.71	€ 178,608.51	€ 167,462.52

<1> Officer is designated as a senior executive until no later than September 1, 2023 in connection with previous position as Director NSCR.
 <2> Officer is designated as senior executive until no later than October 1, 2024, in connection with change in governance as of October 1, 2020.

Board

Name	Position
M.M. Levi	President
C.E. Visser	Vice president
J. de Boer	Board member
J.J.G. Geurts	Board member until January 15, 2022
A.P. Hardon	Board member
M.A. Ikram	Board member from August 1, 2022
M.P.C. Weijnen	Board member

Accountability regarding the income of board members is provided in the NWO Annual Report.

Table 1d Senior executives with total remuneration of €1,800 or less

Name	Position	
M.M. Levi	President	
C.E. Visser	Vice president	
J. de Boer	Board member	
J.J.G. Geurts	Board member	until January 15, 2022
A.P. Hardon	Board member	
M.P.C. Weijnen	Board member	
M.A. Ikram	Board member	from August 1, 2022

Accountability regarding the income of board members is provided in the NWO Annual Report.

Table 3 Remuneration of non-senior executives

Amounts x €1	Program Leader Research
Job details	
Start and end of job performance in 2022	01/01 - 12/31
Part-time factor in FTE	1
(Notional) employment relationship?	yes
Remuneration	
Remuneration plus taxable expense allowances	€ 225,205.93
Remuneration payable over time	€ 23,122.92
Remuneration	€ 248,328.85
Individually applicable remuneration maximum	€ 216,000.00
The amount of the excess and the reason why the excess is or is not allowed	The person in question works on the EUROFUSION project. NWO-I is required to pay a monthly mobility allowance to the employee which is determined by the project management.
2021 data	Program Leader Research
Start and end of job performance in 2021	01/01 - 12/31
Part-time factor 2021 in FTE	1
Remuneration plus payable expense allowance	€ 216,555.23
Remuneration payable over time	€ 22,352.88
Total remuneration 2021	€ 238,908.11

Notes to Table 3:
In the previous year, the remuneration data for the other executive (position: Program Leader Research) was erroneously excluded from the WNT accounting while the remuneration was indeed higher than the applicable threshold amount (difference of interpretation). This has been rectified by including the 2021 data in the WNT accounting. This does not lead to (changes in) an undue payment.

Depreciation/amortization

	2022 x €1,000	2022 Budgeted x €1,000	2021 x €1,000
Depreciation/amortization			
4.2 Amortization on intangible fixed assets	649	838	296
4.2.1 Depreciation on tangible fixed assets	14,216	14,351	12,615
4.2.2 Movements in investment grants	- 6,311	- 5,580	- 6,029
4.2.3 Depreciation charges passed on	- 54	-	-53
Depreciation/amortization	8,499	9,609	6,830
Breakdown			
Depreciation on tangible fixed assets	14,216	14,351	12,615
Movements in investment grants (-/-)	- 6,311	- 5,580	- 6,029
4.2.1 Total depreciation on tangible fixed assets	7,905	8,771	6,586

The depreciation of tangible fixed assets (€14,216k) is €1,601k more than in 2021, mainly due to higher depreciation charges:

- Buildings (€1,281k), especially new construction SRON, €1,238k
- Inventory (€149k), of which at SRON €128k
- Installations and equipment (€311k), of which at NIOZ €203k
- And lower depreciation charges on Computer Equipment (-€179k), including at ASTRON (€91k) and CWI (€75k)

Investment grants (being a contribution from NWO for New Construction) have been deducted from depreciation of tangible fixed assets (€6,311k), 2021 (€6,029k).

Housing expenses

	2022	2022 Budgeted	2021
	x €1,000	x €1,000	x €1,000
4.3 Housing expenses			
4.3.1 Rent expenses	1,473	675	1,471
4.3.2 Insurance expenses	377	403	310
4.3.3 Maintenance expenses (minor maintenance)	2,027	2,824	1,720
4.3.4 Energy and water	4,344	2,955	4,021
4.3.5 Cleaning costs	1,292	1,132	1,149
4.3.6 Housing taxes and levies	618	600	1,585
4.3.8 Other housing expenses	1,744	5,009	5,094
Housing expenses	11,876	13,598	15,349

Housing expenses (€11,876k) decreased with respect to 2021, by €3,473k, mainly due to:

- €308k increase Maintenance expenses (minor maintenance), of which Nikhef €378k.
- €324k increase Energy and Water, of which NIOZ €753k and SRON €164k, while Nikhef recorded a decrease (€514k), which was due in part to a refund of energy tax in 2022, while no such refund occurred in 2021.
- €967k decrease Taxes and levies, of which SRON €520k.
- €3,350k decrease Other housing expenses, of which SRON €3,460k, which is related to the Relocation to Leiden in 2021.

Other expenses

	2022	2022 Budgeted	2021
	x €1,000	x €1,000	x €1,000
4.4 Other expenses			
4.4.1 Administration and management expenses	28,360	12,307	29,930
4.4.2 Inventory and equipment	6,838	5,929	5,179
4.4.4 Allocation to other provisions	554	-	206
4.4.5 Other	25,312	47,746	21,202
Other expenses	61,064	65,982	56,518
Administration and management expenses			
ICT costs	2,492	1,854	1,690
Outsourced work	1,692	298	4,858
Auditor's costs	535	500	737
Interest expenses associated with interest subsidies	-	-	-
Other administration and management expenses	23,642	9,655	22,644
4.4.1 Administration and management expenses	28,360	12,307	29,930
Breakdown Auditor's costs			
Cost of audit of financial statements	414	430	582
Other audit engagements	87	50	145
Advice on tax matters	34	20	10
Other non-audit services	-	-	-
Auditor's costs	535	500	737
Other			
Research-related costs	21,174	44,109	19,099
Travel and subsistence expenses	3,968	777	1,174
Other expenses	170	2,860	929
4.4.5 Other costs	25,312	47,746	21,202

The Other expenses amounted to €61,064k, which is €4,546k more than 2021.

- Administration and management expenses (€28,360k) decreased by €1,570k, of which
 - €801k increase in ICT expenses, of which at Nikhef €521k
 - €3,167k decrease in Subcontracted work, €3,427k of which at Nikhef, which related to the renovation of the premises and these costs are not recognized as expenses but as investments in Tangible fixed assets.
 - Other management expenses, increase of €998k, mainly at NIOZ and SRON and less at Nikhef.
- Inventory and equipment (€6,838k) increased by €1,659k, mainly at AMOLF (€957k) and NIOZ (€1,138k).
- The item Other (€25,312k) increased by €4,110k, of which
 - Research-related costs (€21,174k) an increase of €2,075k, especially an increase on account of higher production activities at DIFFER (€442k), Nikhef (€517k), NIOZ (€2,103k) and SRON (€995k) than in 2021, alongside that a decrease at ALGEMEEN (€1,084k) and ASTRON (€524k).
 - Travel and accommodation expenses (€3,968k), an increase of €2,794k, since the coronavirus measures were lifted, which allowed travel at home and abroad again. Increased costs especially at AMOLF (€312k), ASTRON (€212k), CWI (€353k), Nikhef (€969k), NIOZ (€341k) and SRON (€261k).
- For the auditor's costs, the costs of auditing the financial statements for the 2022 audit were fully accounted for to the extent known. The expenses included under this item for 2022 relate to the current auditor Ernst & Young Accountants LLP.

The item other audit engagements of €87k relates to the audit of projects by Ernst & Young Accountants LLP.

Notes on expenses compared to the Budget

	Expenses	2022	2022 Budgeted	2021
		x €1,000	x €1,000	x €1,000
4.1	Personnel expenses	139,643	134,542	139,917
4.2	Depreciation/amortization	8,499	9,609	6,830
4.3	Housing expenses	11,876	13,598	15,349
4.4	Other expenses	61,064	65,982	56,518
	Total expenses	221,083	223,731	218,614

The total expenses amounted to €221,083k and were €2,648k less than the budget

- Personnel expenses, €5,101k higher,
 - Other personnel costs €5,332k, of which
 - €3,794k more in Non-employee personnel expenses
- Depreciation expenses, €1,110k lower,
 - mainly due to higher Investment Grant Release (€731k) than budgeted
- Housing expenses €1,722k lower, of which
 - Rent €798k higher,
 - Maintenance costs €797k lower,
 - Energy €1,389k higher,
 - Other housing expenses €3,265k lower.

In the budget, expenditures are budgeted for SRON for the New Construction, which are included partially as expenses, although these will ultimately be capitalized and for which depreciation will subsequently be applied
- Other expenses, €4,918k lower, of which
 - Administration and management expenses €16,053k higher,
 - Inventory and equipment €909k higher,
 - Allocation to other provisions €554k higher,
 - Other €22,434k lower than budgeted.

In the budget the contribution to SKA was included as research-related costs, in the realization this was accounted for under other management expenses.

NET RESULT

	2022	2022 Budgeted	2021
	x €1,000	x €1,000	x €1,000
Balance of income and expenditure	21,910	- 3,711	- 2,544
5 Realized revaluation	-	-	-
6 Financial income and expenditure	1,433	- 3	8
Result	23,343	- 3,714	- 2,536
7 Taxes	-	-	-
8 Result from participating interests	372	-	- 254
Result after taxes	23,715	- 3,714	- 2,790
9 Third-party share in result	-	-	-
Total net result	23,715	- 3,714	- 2,790

The result for the 2022 financial year amounts to €23,715k and is allocated within equity according to the specification below. For further explanation, see the relevant balance sheet items in the Notes to the balance sheet.

Distribution of result

	2022	2022 Budgeted	2021
	x €1,000	x €1,000	x €1,000
Distribution of result			
• Movement in general reserve	7,158	-	- 62
• Movement in legal reserve	-	-	-
• Movement in earmarked reserves (public)	17,515	- 2,276	- 3,771
• Movement in earmarked Funds	- 209	- 600	- 693
• Movement in other legal reserves	- 749	- 838	1,738
• Movement in other components	-	-	-
Total distribution of result	23,715	- 3,714	- 2,790

9 Notes to cash flow statement

The cash flow statement of NWO-I shows what caused the increase in liquidity of €21,409k.

The cash flow from operating activities resulted on balance in an increase of €49,045k, mainly due to depreciation (€14,865k), an increase in Receivables (€11,358k) and an increase in Current liabilities (€306k).

The movement in the current liabilities takes into account the annual movement from the long-term investment grant to the short-term investment grant.

The cash flow from investing activities resulted in a decrease in liquid assets of €27,636k mainly due to changes in (In)tangible fixed assets (-€28,538k), Investment grant received in advance for the NANOlabor at AMOLF (€863k) and changes in Financial fixed assets (€39k).

10 Events after the balance sheet date

There were no events after the balance sheet date with significant financial impact on the 2022 figures.

Other information

11 Independent auditor's report

12 Provisions in the articles on result appropriation

The articles contain no stipulations concerning the result appropriation.

The following is an English translation of the independent auditor's report issued 15 June 2023.

Independent auditor's report

To: the board of the Foundation for Dutch Scientific Research Institutes

Report on the financial statements 2022 included in the annual report

Our opinion

We have audited the financial statements 2022 of the Foundation for Dutch Scientific Research Institutes, based in Utrecht.

In our opinion the financial statements included in this annual report give a true and fair view of the financial position of the Foundation for Dutch Scientific Research Institutes as at 31 December 2022, and of its result for the year 2022 in accordance with the RJ-Richtlijn 660 Onderwijsinstellingen (Dutch Generally Accepted Accounting Principles for Educational Institutions) and in accordance with the provisions contained in Wet Normering Topinkomens (WNT) (Standards for Remuneration Act).

The financial statements comprise:

- The balance sheet as at 31 December 2022
- The statement of income and expense for the year 2022
- The notes comprising of a summary of the accounting policies and other explanatory information

Basis for our opinion

We conducted our audit in accordance with Dutch law, including the Dutch Standards on Auditing and the Auditing Protocol 2022 for WNT. Our responsibilities based on these are further described in the Our responsibilities for the audit of the financial statements section of our report.

We are independent of the Foundation for Dutch Scientific Research Institutes in accordance with the "Verordening inzake de onafhankelijkheid van accountants bij assurance-opdrachten" (ViO, Code of Ethics for Professional Accountants, a regulation with respect to independence) and other relevant independence regulations in the Netherlands. Furthermore we have complied with the "Verordening gedrags- en beroepsregels accountants" (VGBA, Dutch Code of Ethics).

We believe the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Compliance with anti-cumulation provision of WNT is unaudited

In accordance with the "Controleprotocol WNT 2022" (WNT Auditing Protocol 2022), we did not audit the compliance with the anti-cumulation provision in Section 1.6a of the WNT and Section 5(1) (n and o) of the "Uitvoeringsregeling WNT" (WNT Implementation Regulation). Therefore, we did not audit whether or not a remuneration maximum was exceeded by a senior management official as a result of possible employment as senior management official at other institutions that are subject to the WNT, nor did we audit whether the required disclosure is accurate and complete in this respect.

Report on other information included in the annual report

In addition to the financial statements and our auditor's report thereon, the annual report contains other information.

Based on the following procedures performed, we conclude that the other information is consistent with the financial statements and does not contain material misstatements.

We have read the other information. Based on our knowledge and understanding obtained through our audit of the financial statements or otherwise, we have considered whether the other information contains material misstatements.

By performing these procedures, we comply with the requirements of the Dutch Standard 720. The scope of the procedures performed is substantially less than the scope of those performed in our audit of the financial statements.

The board is responsible for the preparation of the other information, including the board report and the other information as required by Standard 720.

Description of responsibilities for the financial statements

Responsibilities of the board for the financial statements

The board is responsible for the preparation and fair presentation of the financial statements in accordance with the RJ-Richtlijn 660 Onderwijsinstellingen and in accordance with the provisions contained in Wet Normering Topinkomens (WNT). In this respect, the board is also responsible for such internal control as the board determines is necessary to enable the preparation of the financial statements and compliance with relevant laws and regulations, without material misstatements, whether due to fraud or error.

As part of the preparation of the financial statements, the board is responsible for assessing the entity's ability to continue as a going concern. Based on the financial reporting framework mentioned, the board should prepare the financial statements using the going concern basis of accounting unless the board either intends to liquidate the education institution or to cease operations, or has no realistic alternative but to do so.

The board should disclose events and circumstances that may cast significant doubt on the institution's ability to continue as a going concern in the financial statements.

Our responsibilities for the audit of the financial statements

Our responsibility is to plan and perform the audit engagement in a manner that allows us to obtain sufficient and appropriate audit evidence for our opinion.

Our audit has been performed with a high, but not absolute, level of assurance, which means we may not detect all material errors and fraud during our audit.

Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements. The materiality affects the nature, timing and extent of our audit procedures and the evaluation of the effect of identified misstatements on our opinion.

We have maintained professional skepticism throughout the audit and have exercised professional judgment where relevant, in accordance with Dutch Standards on Auditing, de Regeling Controleprotocol WNT 2022 (Regulation Auditing Protocol WNT), ethical requirements and independence requirements.

Our audit included among others:

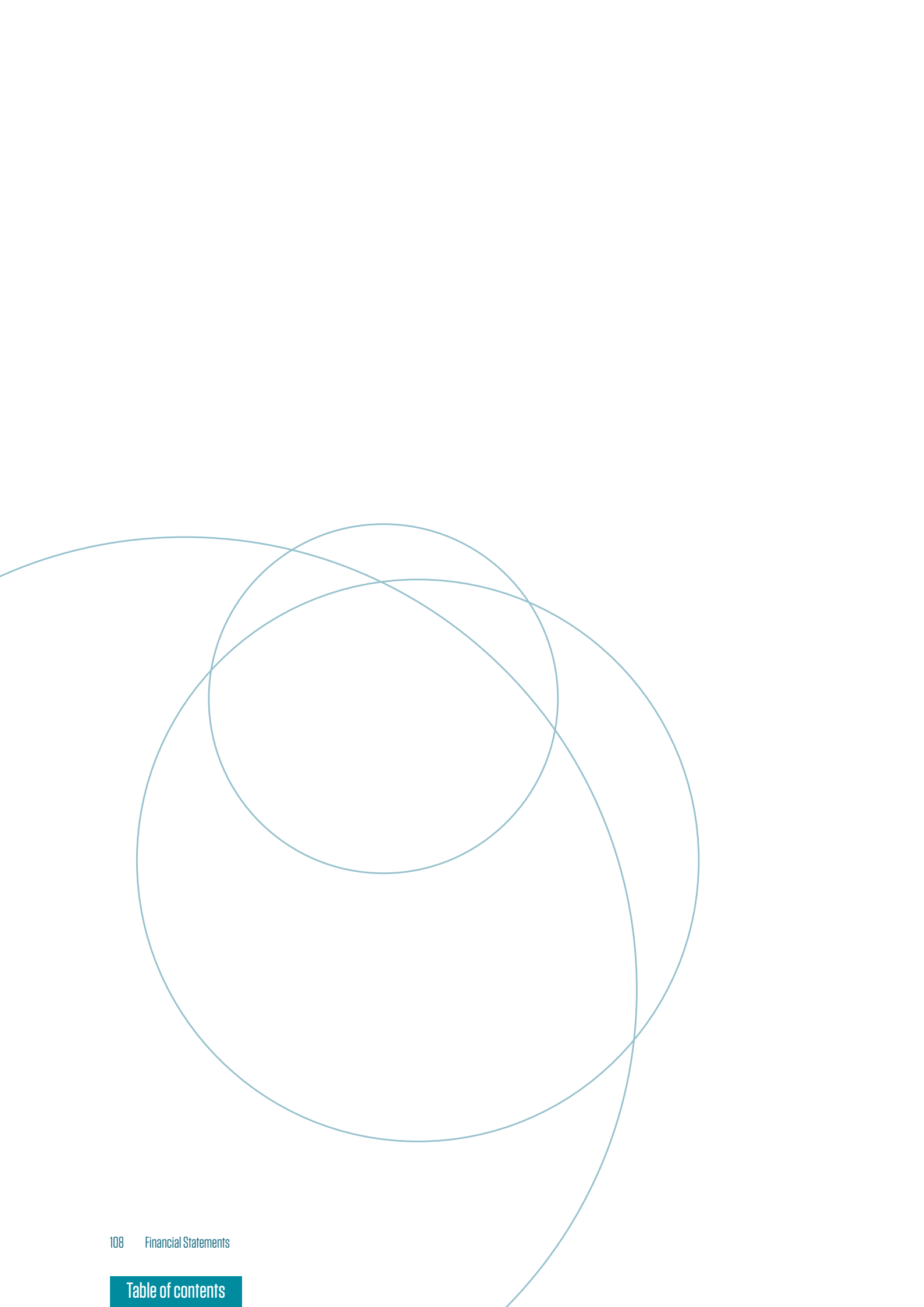
- Identifying and assessing the risks of
 - Material misstatement of the financial statements, whether due to fraud or error
 - Illegitimately generating of income and expenditures as well as movements in the balance sheet that are of material importance
- Designing and performing audit procedures responsive to those risks, and obtaining audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control
- Obtaining an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the internal control of the education institution's internal control
- Evaluating the appropriateness of accounting policies used, the financial criteria applied for legitimacy and the reasonableness of accounting estimates and related disclosures made by the board
- Concluding on the appropriateness of the board's use of the going concern basis of accounting, and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the education institution's ability of to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause an institution to cease to continue as a going concern
- Evaluating the overall presentation, structure and content of the financial statements, including the disclosures
- Evaluating whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation and whether the income and expenditure recognized in the financial statements as well as movements in the balance sheet have in all material respects been legitimately generated

We communicate with the board regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant findings in internal control that we identify during our audit.

Utrecht, 15 June 2023

Ernst & Young Accountants LLP

M.A. Brandhorst



LIST OF ABBREVIATIONS

ABP	Algemeen Burgerlijk Pensioenfonds [General Pension Fund for Public Employees]
AMOLF	Institute for physics of functional complex matter
AO	administrative organization
ARCNL	Advanced Research Center for Nanolithography
ASTRON	Netherlands Institute for Radio Astronomy
BUW	University Working Groups Administrative Unit
CLA	Collective Labor Agreement
CWI	Research Institute for Mathematics & Computer Science in the Netherlands
DIFFER	Dutch Institute for Fundamental Energy Research
FOM	Foundation for Fundamental Research on Matter
FTE	full time equivalent
IC	Internal control
Nikhef	National Institute for subatomic physics
NIOZ	Royal Netherlands Institute for Sea Research
NSCR	Netherlands Institute for the Study of Crime and Law Enforcement
NWO	Dutch Research Council
NWO-I	Foundation for Dutch Scientific Research Institutes
OCW	Ministry of Education, Culture and Science
P2IP	Particle Physics Inside Products BV
SRON	Netherlands Institute for Space Research
UvA	University of Amsterdam
VU	Vrije Universiteit Amsterdam
WNT	Senior Executives in the Public and Semi-Public Sector (Standards for Remuneration) Act
WW	Unemployment Insurance Act.



Colophon

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