

NWO-I

Board Report and Financial Statements 2021

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 14th 2022. In case of any discrepancies or possible differences in interpretation between the English translation and the financial statement prepared on June 14th 2022, the latter prevail. The original and official Dutch financial statements are available [here](#).

Foundation for Dutch Scientific Research Institutes (NWO-I)



Colophon

Cover photo

Tracking down defects in the latest generation of computer chips

Researchers at ARCNL work on new technologies to observe the tiniest changes or defects in the nanostructures that make up the latest generation of computer chips. To this end, extremely small signal changes have to be used as a source of information. This can be done by measuring over a longer period of time or by amplifying the signal. Researchers at ARCNL and Delft University of Technology opted for the latter for their measurements of reflection in samples similar to materials from the nanolithography application. By generating what is referred to as plasmonic resonance, they were able to amplify the fluctuations in reflection caused by laser-driven sound waves. Using reflection measurements, they can detect nanostructures hidden under various layers of opaque material.

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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
- ARCNL | the collaboration the Advanced Research Center for Nanolithography

In addition, there are about 110 working groups at universities (BUW: Administrative Unit for Research Groups at Universities) 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 the European Union, the government and from collaborations with universities, industry and other public and private parties.

At the end of 2021, NWO-I employed a rounded number of 1,662 FTE (1,786 people), including (a rounded number of):

- 544 FTE (588 people) scientific personnel;
- 394 FTE (398 people) PhD students;
- 725 FTE (800 people) technicians and other staff.

The researchers at the institutes collectively produced a total of 87 dissertations, 1,624 scientific (referenced) publications, and 1,339 other publications in 2021.

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NWO-I Foundation

Board Report 2021

Foundation for Dutch Scientific Research Institutes (NWO-I)



Foreword

When I started in April 2021 as president of NWO, and the Foundation for Dutch Scientific Research Institutes (NWO-I), I soon proceeded to visit our nine NWO institutes. I was very much impressed by what I saw and heard there right away. I walked around high-tech laboratories, past huge research facilities, buzzing data centers and the occasional oasis of peace and quiet near the offices of employees who were hard at work analyzing results. The research into new knowledge at NWO-I became alive and tangible for me. I sincerely asked myself, why doesn't "everyone" know about this downright exciting work happening day to day, and what happens with the results. At the same time, I realize that the fundamental science that our institutions are engaged in, the search for the limits of humanity's understanding often seems somewhat far removed from practical application. That does not make this work any less necessary, however. Moreover, the promising application of a discovery does reveal itself right away at times. All our research in collaboration with many international partners is aimed, without exception, at becoming wiser and at solving countless global challenges. Perhaps, in part, due to this realization, the government decided in December 2021 to allocate additional billions of dollars extra towards research and innovation.

In the midst of the ongoing coronavirus pandemic and its impact on our work, NWO-I continued its mission in 2021. In the annual report before you, we illustrate our work with some highlights of our research on the one hand, while covering administrative changes on the other. For example, the NWO institutes NSCR and NIOZ both welcomed new directors, and ASTRON also managed to secure a new director who will start in 2022. Unfortunately, the NWO-I director resigned in June. This prompted NWO's Executive Board to reexamine its current operating model together with an external consulting firm. The Permanent Committee on National Institutes (PCNI) issued preliminary advice to the boards of NWO and KNAW on developments of major scientific importance to which the portfolio of institutes should respond.

We continued to work on international promises via major scientific infrastructures. We continued to build on the national research fleet of NWO institute NIOZ; managed and built LOFAR and SKA, the largest and most powerful radio telescopes in the world, respectively, via NWO institute ASTRON; made significant progress, thanks to NWO institute Nikhef, in collaboration with many other parties, in bringing the construction of the Einstein telescope (ET) to South Limburg. Of equal importance were the very concrete results, such as the supply by NWO institute SRON of an important instrument for NASA's PACE mission, which will map, among other things, ash, desert dust and soot in our atmosphere; particles with great impact on climate change. NWO institute DIFFER participated in the achievement of new milestones in the construction of the world's largest fusion reactor, which aims to generate clean energy by replicating the sun's process of fusing hydrogen atoms.

NWO-I continually strives to advance its research and operations, paying close attention to the inquiries and concerns of society. Our scientific practice must be open and ethical. In this regard, we aim to be as diverse and inclusive an organization as possible; we explore ways to fairly acknowledge and value the contributions of our scientists; and we seek to make our knowledge widely accessible while safeguarding it from hackers and state actors with malicious intentions towards us and the world at large. The attack on Ukraine by Russian troops on February 24, 2022, serves as a prime example of how the world can suddenly change course in unforeseen ways. It makes us realize new things and necessitates adjustments. The consequences of this armed conflict cast shadows into the future and our institutions are deliberating intensively on the implications for international collaborations. All these efforts consistently serve our mission to promote and carry out top-notch scientific research.

Marcel Levi
President of NWO-I

1 Introduction

You have before you the 2021 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 2021. With this publication, NWO-I renders account to its financiers and society at large.

This annual report is divided into three parts. The first part consists of the board report, which includes an overview of events and financial developments in 2021. It also contains a description of what the NWO-I organization looks like.

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

The third part is the audit opinion of the independent auditor and the provisions from the articles of incorporation 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. By conducting, making accessible and disseminating that research in a pioneering way, with integrity and excellence, the NWO institutes realize knowledge and solutions with scientific and societal impact.

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 for achieving 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 missions are regularly determined by the NWO Executive Board 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 to be answered.

2 Key developments

This chapter sheds light on several impactful developments for NWO-I in 2021.

2.1 New coalition agreement

On December 15, 2021, the parties VVD, D66, CDA, and ChristenUnie reached a coalition agreement. That same day, informateurs Koolmees and Remkes presented their final report. Mark Rutte was subsequently appointed formateur and shortly thereafter the new ministers were announced, which included Robbert Dijkgraaf as the new Minister of Education, Culture and Science. NWO responded to the new government's plans for research and innovation with great enthusiasm. The government is moving toward a knowledge-based economy, investing in free and unfettered research and development in line with the Lisbon target. One measure in this regard is the establishment of a fund in which the government will invest a total of €5 billion over the course of 10 years. The predictability of funding is increased by eliminating the perverse incentive for higher intake, revising and increasing the fixed base, and reaching a better balance between direct and indirect funding. This will allow more room to address workloads, offer open-ended contracts and maintain a balanced supply in shrinking regions. An additional 6.7 billion euros will also be available in the National Growth Fund for knowledge development and innovation. All of this presents wonderful opportunities for NWO-I to develop new national initiatives and programs. The government's plan to invest 35 billion euros in climate change and related issues aligns perfectly with NWO's ambitions to make substantial investments in this area (as detailed in Chapter 3).

2.2 Development of new NWO strategy

The current NWO strategy runs through 2022. In 2021, NWO started a process to formulate a new strategy for the 2023-2026 period. During the fall of 2021, NWO conducted comprehensive consultations to gather as much input as possible. The new strategy will largely build on the previous one, while allowing for new elements as well. The NWO institutes are also given a prominent place in this new strategy because of the national role they play in their respective fields.

2.3 National role and added value of the institutes

Strategic conference of 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. On November 11, 2021, the PCNI hosted an initial strategic conference with stakeholders from around the country to identify topics of high scientific interest that require an institutional approach. The conference was on-site for a small group and online for many others and was preceded by six online consultations. 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 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 plan to conduct a more in-depth analysis in 2022 to pinpoint specific needs and assess the extent to which recently launched initiatives can address those requirements. In mid-January 2022, the PCNI presented its final advice to the boards of KNAW and NWO.

2.4 Vision of the institutes

After an exchange of views between institute directors and the NWO Executive Board, a joint vision for the NWO institutes was adopted after the summer. The document describes the national function of the institutes, includes principles on how the Executive Board directs the institutes, and describes the process of establishing missions, strategic plans and budgets. While the document primarily consolidates established practices, it also serves as a valuable foundation for the future development of our institutes' missions and strategies.

2.5 Board and management

On March 31, 2021, Professor Stan Gielen transferred his duties as president of the NWO-I Foundation Board to Professor Marcel Levi. Under Gielen's presidency, the NWO transition that began in 2017 came to fruition and NWO-I was established as a new national organization of institutes. Since then, the organization has continued to develop: externally by focusing even more on the national added value of the institutes and internally by adapting the governance at the end of 2020 and further developing and professionalizing the operations.

In June 2021, the NWO-I director decided to resign. This prompted the NWO Executive Board to consider the role and position of the NWO-I director. The Executive Board decided to ask an external consulting firm to advise on the future details of the role of NWO-I director, based on interviews with the institute directors, executive board members, the director of operations, a delegation of employees of the NWO-I Office and the employee participation body. This advice was presented to the NWO Executive Board in December 2021. It exposes a number of vulnerabilities in the current governance model and suggestions are made for improved models. The Executive Board will make a decision on the next steps during 2022, which may include a new change in the governance model. In the interim, the responsibilities of the NWO-I director have been distributed among members of the Foundation Board (primarily the president), the NWO-I Director of Operations, and the NWO-I Head of Strategic Support.

On November 1, 2021, Professor Beate Völker joined NWO institute NSCR as their new science director. She succeeded Peter van der Laan who had headed the institute as an interim director for the past two years. Völker will continue to strengthen the institute's ties with universities.

Also on November 1, Professor Han Dolman took over from Professor Henk Brinkhuis as director of NWO institute NIOZ. Brinkhuis had headed the institute for the past ten years, a period that started with a major reorganization and ended with the final decision to revamp the national research fleet. Dolman will continue the course set by Brinkhuis and continue to reinforce the national added value of the institute.

Finally, at the end of 2021, the Foundation Board decided to appoint Professor Jessica Dempsey as the new director of NWO institute ASTRON as of May 1, 2022. Since the departure of Professor Carole Jackson at the end of 2020, the institute was under the leadership of Professor Marco de Vos.

2.6 NWO hack

On February 8, 2021, the NWO systems were hit by a hack: network drives were blocked, documents were rendered inaccessible and a small percentage of the files was stolen. These files included sensitive personal information. A criminal organization demanded ransom from NWO in order to regain control of its own systems and prevent the stolen documents from being released to the *dark web*. NWO did not comply with the ransom demand and, shortly after the hack, filed a police report and notified the Dutch Data Protection Authority.

NWO-I was affected by the cyber attack as well: parts of NWO-I's central administration were stored on the NWO servers. Due to the sensitive nature of the potentially stolen data, NWO-I promptly alerted its employees and informed them about the potential dangers if the data became public. In addition, NWO-I provided support in taking measures to reduce the risks of personal harm. Fortunately, the institutes' systems remained out of the hands of the criminals because they were not linked to the NWO servers. One reason why NWO-I's operations were largely able to continue, although operations at the NWO-I Office were severely hampered both by the hack and the subsequent time it took for the IT systems to be rebuilt. In March, all laptops belonging to NWO-I Office employees were successfully reinstalled, allowing the normal systems to resume operation. All the NWO systems were returned to service on March 22.

2.7 Organizational development NWO-I

In October 2021, the NWO Executive Board adopted a comprehensive package of measures that 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 do and support excellent science while allowing managers and administrators to effectively oversee and manage the autonomous institutes and the organization as a whole, while ensuring compliance with laws and regulations. Following consultation with the Group Works Council, the plans are set to be finalized in 2022.

Initial insight into the influence of the Higgs particle

Researchers from the National Institute for Subatomic Physics, Nikhef, garnered attention with an initial estimate of the influence the Higgs particle has on lighter matter particles. To achieve this, they utilized all the measurement data from the ATLAS detector at the LHC super

accelerator at CERN in Geneva, where the Netherlands is an important partner. From the measurements, they were able to deduce that the Higgs particle has a stronger effect on heavy elementary particles than on lighter counterparts. This aligns with the Higgs theory, which posits that the Higgs particle imparts specific masses to elementary particles, increasing as the coupling becomes stronger. The coupling for the heaviest quarks was already known, but ATLAS had the distinction of being the first to demonstrate it for the medium-weight charm quark. In 2022, it will be a decade since the existence of the Higgs particle was demonstrated at CERN. It has a central and connecting position among elementary particles and has been the subject of much research since its discovery.

ATLAS - Credits: Nikhef



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. Lastly, a summary of the scientific output is provided.

3.1 Developments in the portfolio of institutes

NWO and KNAW established the Permanent Committee on National Institutes (PCNI) chaired by Professor Wim van Saarloos in the first half of 2020. The PCNI advises the boards of KNAW and NWO on scientific and societal developments that may need to be taken into consideration in the portfolio of the national research institutes.

3.1.1 PCNI's advice

The PCNI issued its preliminary advice in December 2021, which was followed in January 2022 by the official, first advice to NWO and KNAW under the title 'National institutes: opportunities for the future'. In the preliminary advice, the committee identifies a need for rapid joining of forces and coordination in the areas of climate research and data infrastructure, storage and management. These new collaborations are intended to take shape in “new-style” institutes that connect existing strengths across the country, bring together scientists from

NIOZ sea level expert lead author of IPCC climate report 2021

NIOZ researcher Aimée Slagen was one of two lead authors of the chapter on sea level rise in the UN IPCC climate report published in August 2021. The report received a great deal of media attention just after the devastating floods in the Netherlands, Belgium and Germany and the Mediterranean coastal fires. Slagen: "Sea level rise is a barometer for climate change, because it brings together so many important processes. Major regional differences exist. The rate of sea level rise at each location depends on factors such as ocean warming and currents, the position on Earth relative to the glaciers and ice caps, and local seismic activity. For instance, in Northern Europe, the melting of Antarctica is particularly relevant, as we will experience an additional 10% increase in sea level rise above the global average - caused by Antarctica. It sounds counterintuitive, but when ice melts in Antarctica, the force of attraction there is reduced, which causes sea levels near the South Pole to decrease. The water from the melted ice ends up in the ocean and that water has to go somewhere. In the Northern Hemisphere, this effect actually results in nearby sea levels rising more than the global average. The most crucial action we can take to slow sea level rise is to significantly reduce greenhouse gas emissions. At the same time, we must prepare to deal with the inevitable fraction of sea level rise. Rising sea levels increase the risk of flooding and cause salinization of groundwater and drinking water, for example."

Lauwersoog, The Netherlands - December 6, 2013: Extreme high tide at the levees of the Dutch coastal defenses, a small harbor is in danger of flooding.

MyImages – Micha/Shutterstock.com



all disciplines and drive national coordination. 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.

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 Trippenhuys on November 11, 2021. NWO and KNAW responded positively to the recommendations, acknowledging the needs in the two identified themes of climate and data infrastructure. With regards to the climate theme, NWO and KNAW immediately began preparations at the end of 2021 to establish a Climate Task Force in early 2022 that will focus 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. The Climate Task Force is expected to provide its recommendations by summer 2022, which will also shed light on the implications for NWO-I. Regarding data infrastructure, NWO and KNAW will conduct further analysis in 2022 to determine the specific areas where needs exist and to what extent new initiatives that have recently been launched can fulfill those needs.

3.1.2 National orientation DIFFER

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. These plans signify that DIFFER is embarking on a new strategic direction, which will be outlined in a strategic plan to be released in 2022. The funding required for this

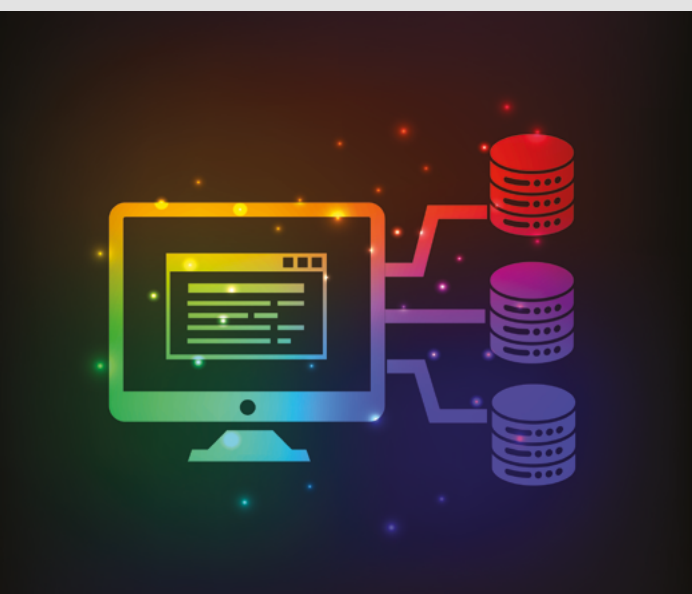
A plunge into a sea of materials

Databases of materials contained valuable information for the energy research field, but searching them took a lot of time. DIFFER researcher Süleyman Er and colleagues managed to link those databases. The work appeared in *Nature Scientific Data*. Materials research plays an important role in accelerating the energy transition. Those looking for a material or combination of materials with specific

properties have countless options available. The number of candidate materials is so overwhelming that systematically recording their properties has become a profession in itself. Numerous databases have emerged with information on structure and properties. Every database has its own interface (API) to retrieve stored information.

The OPTIMADE consortium (Open Databases Integration for Material Design) developed an interface that allows all connected databases to be searched at once. This enables rapid screening of materials, even using artificial intelligence. Which accelerates the search for new materials for the energy transition.

Photo: Shutterstock



new strategic direction will be partly provided by DIFFER from its own resources and partly through applications submitted in open competition.

3.1.3 New scientific plan for a nationally connected CWI

In early 2020, an external authoritative expert conducted an exploration focused on 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 and are expected to be laid down in a new strategic plan before the summer of 2022.

3.1.4 Beate Völker continues on new direction of NSCR

In 2020, at the request of the NWO Executive Board, an exploratory report was drawn up for NSCR containing several recommendations. In 2021, interim director Professor Peter van der Laan engaged in discussions with all relevant university stakeholders to establish a revised scientific program with national support and consensus on how the institute can add value to the field of Crime and Law Enforcement. This culminated in a conference on June 24, 2021 - held online, unfortunately, because of the coronavirus pandemic - which was attended by faculty and university administrators and scholars from all relevant universities. The findings of this conference will be incorporated into a new strategic plan for the institute by NSCR's new director, Beate Völker, who took office on November 1, 2021. Research grew in scope in 2021 thanks to the national research program started a year earlier titled *What works in policing: toward evidence-based policing in the Netherlands*. This program is being developed and implemented by NSCR with the cooperation of the National Police, the Police Academy, universities from the Netherlands and abroad, universities of applied sciences and other knowledge institutes. The collaborating parties focus on the scientific fleshing out and substantiation of evidence-based police practice and on analyzing issues for the police (function).

3.1.5 Han Dolman new director of NIOZ

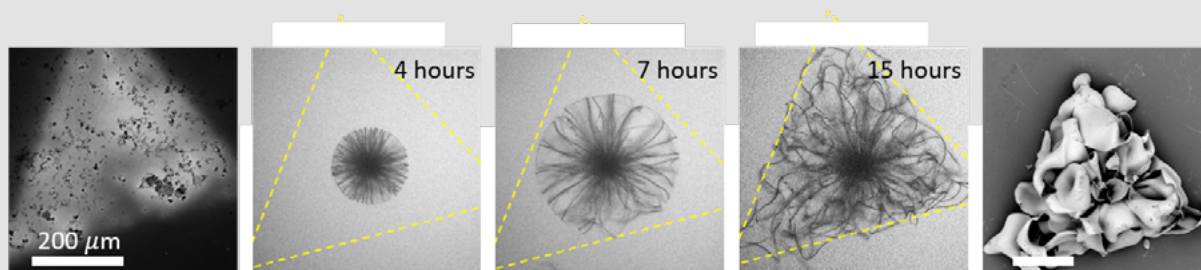
On November 1, 2021, Professor Han Dolman started as director of NIOZ. Professor Henk Brinkhuis had headed the institute for the past decade, a period that started with a major reorganization and ended with the final decision to revamp the national research fleet. Dolman will stay on the course set by Brinkhuis and will continue to reinforce the national added value of the institute. Under his leadership, the new research fleet, which is currently being constructed, will be launched and made accessible to the Dutch naval and maritime research community.

3.1.6 Jessica Dempsey new director of ASTRON

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, but also on realizing opportunities for greater diversity, equity and inclusion.

Crystals under the tanning bed

The AMOLF research group Self-Organizing Matter has managed to control the formation of nanocomposites in the form of corals or vases to perfection using light. By exposing a solution containing the appropriate ingredients to UV light, researchers are able to control where and when specific structures form at the micrometer level. The group has been making beautiful crystal structures at the nanoscale for several years, from corals and vases to helices. Those structures form spontaneously from various chemicals. The shape depends on the amount and type of substances combined. Researchers can choose whether to make a coral or vase, but not where and when it will start to grow. PhD student Marloes Bistervels has now demonstrated that light can be effectively utilized to gain control over this process. Using a thin beam of UV light, she is able to influence a chemical reaction at the micrometer scale selectively and with high precision.



The photo series involves a timelapse of optical microscopy images of the growth of a triangular BaCO₃ silica nanocomposite. Using a static triangular UV light pattern (photo left), the researchers controlled the contour of the nanocomposite in the shape of a triangle.

Credit: AMOLF

3.2 Scientific infrastructure

Through its institutes, NWO enables Dutch researchers to access national or international scientific infrastructure. Our 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. This often occurs as part of large international consortia that NWO institutes make Dutch contributions to 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 by scientific users. These are often long-term projects: decades of preliminary study, development, construction, testing, and integration of components precede the final scientific experiments for which they are intended.

3.2.1 Gravity waves in Limburg: the Einstein telescope

The 2017 Nobel Prize in 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. NWO institute 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. The application was submitted to the National Growth Fund by the Ministry of Education, Culture and Science in 2021.

The Nikhef director is one of the two coordinators of the European ET project and the Netherlands is well represented in the steering committee via Nikhef. Under the direction of NWO-I, two consultative structures were established in 2021: a Board of Scientific Representatives and a Board of Governmental Representatives, with the secretariat for both vested in NWO-I.

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. On July 8 and November 9, 2021, both ships had their keels ceremonially laid, with a coin "for good luck" welded onto the keel beams according to maritime tradition. Construction of both ships is progressing steadily. Meanwhile, the tender process for the construction of the third and largest research vessel, the RV Anna Weber-van Bosse, continued in 2021. Construction of this ship is expected to begin in 2022.

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. Bulgaria joined as a new partner in 2021. 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). This 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.

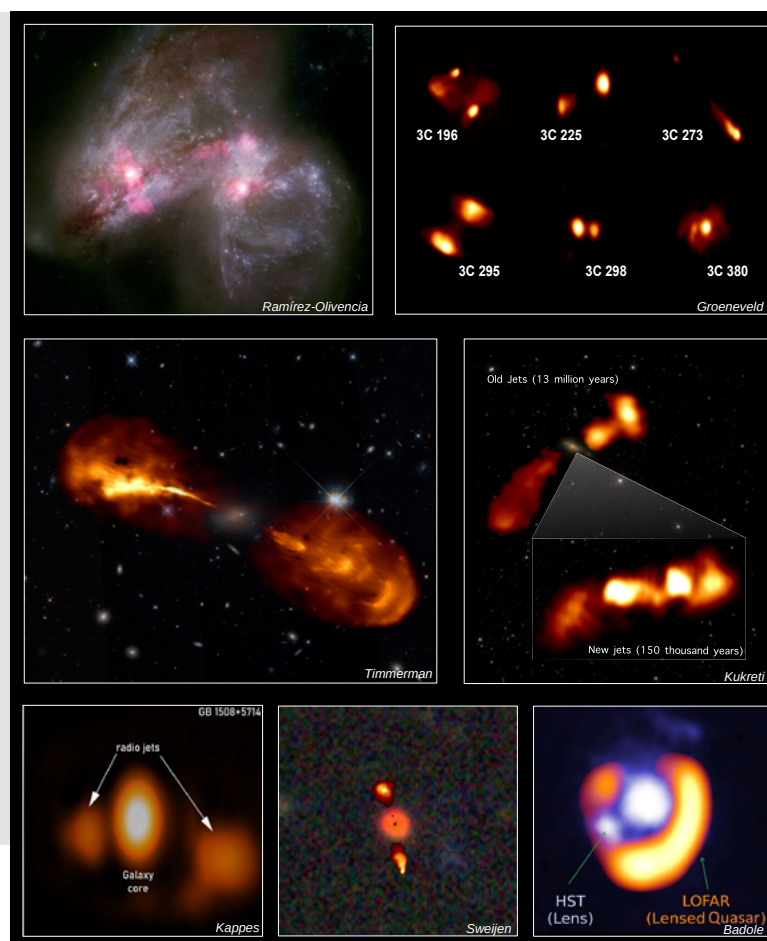
3.2.4 Green light for world's most powerful radio telescope SKA

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 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).

The most detailed images of distant galaxies ever taken

An international team of astronomers has revealed the inner workings of galaxies far beyond our own with unprecedented detail. The images were created with data collected by the Low Frequency Array (LOFAR), a radio telescope built and maintained by ASTRON. The LOFAR network takes images at FM radio frequencies that, unlike shorter-wavelength sources such as visible light, are not blocked by the clouds of dust and gas that can cover astronomical objects. Regions of space that appear dark to the naked eye actually emit intense radio waves, allowing astronomers to observe star-forming areas or even the cores of galaxies themselves.

Credit: ASTRON.



3.2.5 End of Westerbork Apertif surveys

In 2021, NWO institute ASTRON concluded the final large-scale measurements (surveys) of the northern sky using the Westerbork Synthesis Radio Telescope (WSRT). With the Apertif system developed at ASTRON, the WSRT's field of vision and speed were significantly increased. It was not feasible to continue the measurements, for various reasons. With the archive built up over the past few years, much valuable research will be done in the coming years. The telescopes in Westerbork will remain part of the European VLBI Network and are also being used for monitoring Galileo satellites.

3.2.6 Successful test with SPeXone instrument for climate research

NWO institute SRON supplied the SPeXone flight instrument in Toulouse in 2021, after which the instrument was successfully tested for NASA's PACE mission. Launch is scheduled for 2023. This took place in the digital presence of then Minister for Education, Culture and Science Van Engelshoven. PACE will be a satellite that measures a number of factors that influence earth's climate: plankton, aerosols and clouds. The SPeXone instrument will map aerosols, small particles in the air, such as ash, desert dust and soot, which have a major influence on air pollution and climate change. Their exact role is not yet sufficiently understood; most aerosols have a cooling effect on the earth by reflecting sunlight, but they can also have a warming effect by adsorption of other substances. Their interaction with clouds makes the situation even more complex.

3.2.7 Milestones in the construction of the world's largest nuclear fusion reactor ITER

NWO institute DIFFER coordinates the Dutch contribution to the Horizon2020 program EUROfusion and cooperates with the European Fusion4Energy agency for companies that want to participate in the construction of ITER. ITER will be the world's largest nuclear fusion experiment; starting in 2025, it is set to demonstrate the technical feasibility of producing clean, almost inexhaustible energy from the same process that causes the sun to shine: nuclear fusion of hydrogen atoms. ITER will also be the first nuclear fusion reactor to generate more energy than is needed to keep this fusion process going. DIFFER manages the Magnum-PSI research facility, the only such facility in the world where wall materials can be tested under extreme conditions such as those

found in ITER. DIFFER is also working on the prediction, measurement and control of the erratic processes in the fusion plasma. In 2021, several milestones were reached in the construction of the huge nuclear fusion reactor. The first few enormous magnetic spools were assembled and integration has started of the first vacuum vessel segments, which will eventually form a toroid some thirty meters in diameter and thirty meters high.

3.2.8 Breakthroughs in health, energy and materials thanks to 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 unique combination, 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 and expires in 2022. In 2021, discussions took place with the NWO Executive Board to explore sustainable funding for this unique facility. In the process, steps were also explored to have HFML-Felix join the national portfolio of institutes. Although the boards of Radboud University and NWO are sympathetic to this option, it does require that the necessary resources be found. This search will be continued in 2022.

In 2021, the cooperation of HFML-Felix with the Fritz-Haber Institute was fleshed out in the establishment of a joint Max Planck Center. The Max Planck Center is a special five-year collaboration, financially supported by the Max Planck Gesellschaft, with the option to extend for another five years.

3.2.9 ESRF and DUBBLE

The European Synchrotron Radiation Facility (ESRF) is a large measurement facility in Grenoble that the Netherlands participates in. It is a treaty organization that includes the Netherlands and Belgium as members via the so-called Benesync consortium. NWO-I provides membership in the council on behalf of the Netherlands. In 2020 and 2021, this facility was thoroughly upgraded to now house the most powerful synchrotron bundle in the world. Despite the significant impact of the coronavirus pandemic, the ESRF has had a successful year, with the new facility being fully operational within the anticipated timeframe and budget.

Energy-efficient AI detects heart defects

Over the past decade, Artificial Intelligence (AI) has increasingly found applications in everyday life, including the recognition of speech and gestures. This is achieved using deep neural networks; a greatly simplified representation of how the human brain processes information. In order to incorporate AI into mobile applications, it is essential to enhance its energy efficiency. In collaboration with IMEC, CWI researchers Bojian Yin and Sander Bohté developed a mathematical solution: an algorithm that yielded a factor of twenty to forty in

energy gains in a chip implementation. In the case of detecting heart defects, for instance, this would allow the implantation of an ECG-recording chip that can operate for a year on a single battery.

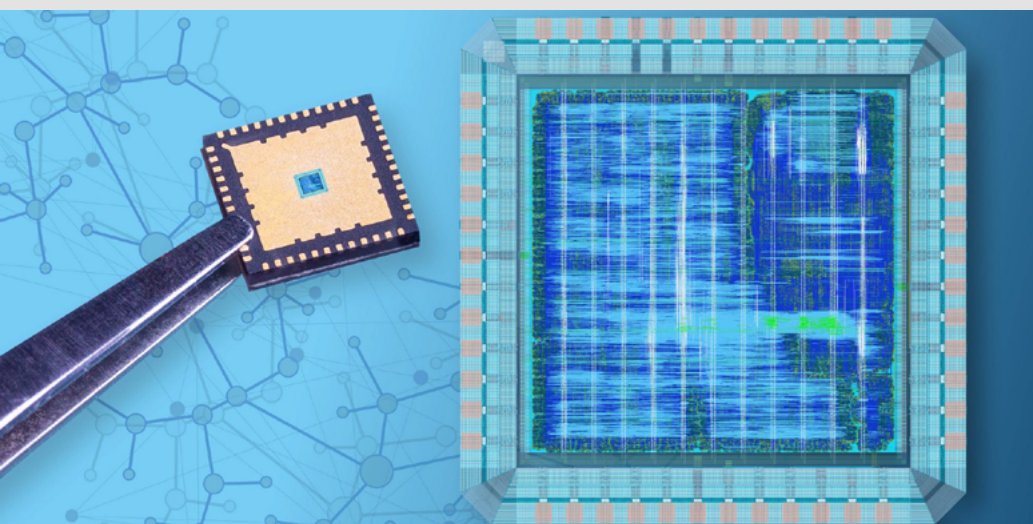


Photo: IMEC

Starting in the spring of 2021, users were able to regain remote access to the facility, followed by physical access later on.

Until December 31, 2021, the Netherlands and Belgium facilitated 'DUBBLE,' two measuring stations at the ESRF where specific experiments are carried out with the bundles of the ESRF. NWO's Executive Board decided in 2018 to terminate participation in DUBBLE as of January 1, 2022. This was after a national invitation failed to elicit a financial commitment from the universities for the continuation of this facility. By the end of 2021, the final preparations were completed to transfer the facility to the Belgian partner in good condition. Dutch researchers will continue to have access to the ESRF through Dutch participation in the organization, though competition for research proposals is expected to increase.

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. Since its establishment, the institute has been collaborating on joint research initiatives with researchers from universities throughout the country. In 2021, the University of Groningen 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.

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.

Applications from the first round were awarded in 2021. NWO institutes AMOLF and CWI participate in the awarded proposal QuantumDeltaNL, which aims to invest heavily (€615 million) in Dutch quantum research and innovation potential. NWO institute DIFFER participates in the Green Power of the Dutch Economy proposal, a project aimed at innovation of production and the use of "green" hydrogen, which was conditionally awarded. NWO institute CWI also participates in Green Power as well as in AINed, aimed at valorization of artificial intelligence (AI), initially via the ELSA Lab Media and Democracy.

In 2021, the second round was open for submission of a select number of proposals with support from different line ministries. NWO institute Nikhef co-sponsored a proposal for the development and construction of the Einstein Telescope in the border region. NWO institute AMOLF participates in the application for Duurzame MaterialenNL, Green Power II and The revolution of self-thinking molecular systems. NWO institute DIFFER is participating in the H2opZee and Green Power II applications.

3.3.3 Development of Delta Knowledge Center in Zeeland

In the Delta Knowledge Center in formation, the Zeeland knowledge institutes will cooperate with the two Dutch universities in Utrecht and Wageningen and the NWO institute NIOZ. The mission of the knowledge center 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 2021. The center is set to launch in early 2022.

3.3.4 Nikhef joins EGO

As of 2021, NWO institute Nikhef officially joined EGO, the European Gravitational Wave Observatory, as the third “full member”, alongside the Italian INFN and the French CNRS. As such, Nikhef is taking an important strategic step for deepened cooperation within the European research into gravitational waves while strengthening the Dutch position in the development and construction of the Einstein Telescope.

3.4 Scientific practice and policy

3.4.1 Scientific integrity

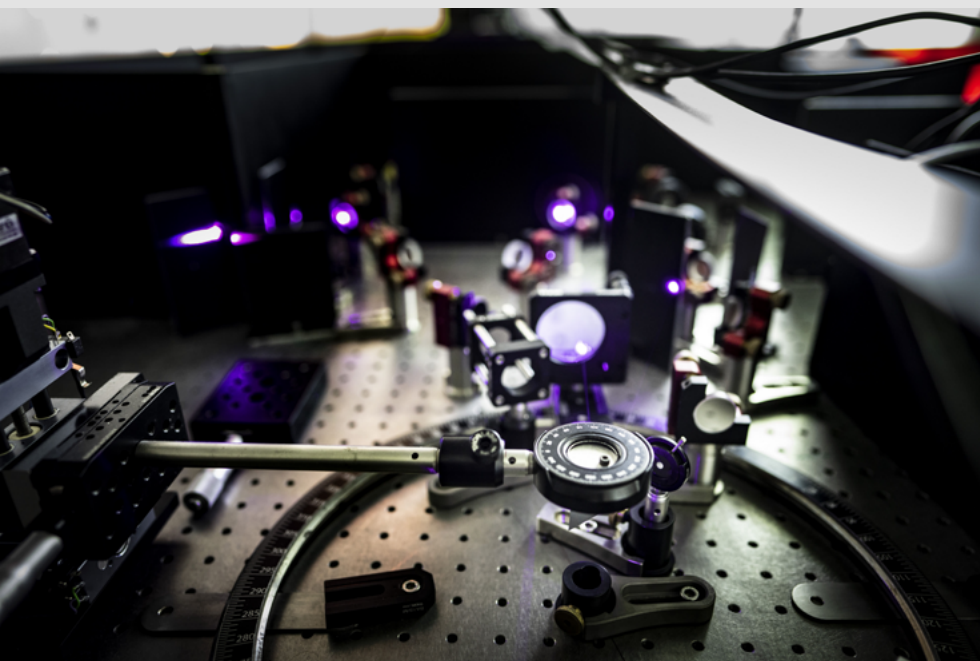
Integrity and the ethical aspects of scientific research are of great value to NWO-I: researchers must be able to work in an open, safe and inclusive research culture in which they discuss the standards of good research practice and hold each other accountable for complying with those standards. It is 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 takes violations of scientific integrity very seriously. It is of the utmost importance, especially for science, that everyone can trust that scientific research is conducted ethically. 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. One complaint was handled by the complaints committee during the year under review.

Plasmonic resonance amplifies subtle change in the reflection signal

Researchers at ARCNL work on new technologies to observe the tiniest changes or defects in the nanostructures that make up the latest generation of computer chips. This requires extremely tiny changes in signal to be used as a source of information. Researchers have two choices in this regard: either they measure over a longer period of time or they amplify the signal. Researchers at ARCNL and Delft University of Technology opted for the latter in order to measure reflection in samples similar to materials from the nanolithography

application. By generating so-called plasmonic resonance, they were able to amplify the fluctuations in reflection caused by laser-driven sound waves. Using reflection measurements, the researchers can detect nanostructures hidden under various layers of opaque material. Experiments in the Light Matter Interaction group led by Paul Planken previously showed that this is possible.

Laser light matter interaction.
Photo: Ivar Pel



Citizens more important reporters of domestic violence since the first lockdown.

Soon after the coronavirus crisis broke out, NWO institute NSCR began research on the possible impact of the coronavirus measures on domestic violence and child abuse. To accomplish this, detailed data from all of the Veilig Thuis [Home Safe] regions were analyzed,

including information on the number of reports, the number of cases (which may be reported multiple times), the reporting party, and the suspected type of domestic violence. The national results of the Stay Home, Stay Safe? survey reveal a shift in who makes the report: from the first lockdown onward, citizens have taken a more important reporting role.



Photo: Shutterstock

In 2021, two confidential advisers for Scientific Integrity were appointed, Professor Thom Palstra and Dr. Tanja Kulkens. Both will visit the institutes in 2022.

Despite the coronavirus restrictions, an awareness campaign was launched in 2021 among the institutes' employees with webinars, external speakers including Professor Ralph Wijers, internal sessions and using the Dilemma Game app developed by Erasmus University.

3.4.2 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, an international group of research funders, in 2018 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 arising from financing from these research funders must be published in open access journals and platforms as of January 1, 2021. Allowing anyone who is interested to read it.

For NWO-I, this means that all articles published by the NWO institutes are immediately accessible to the larger public free of charge 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. Since 2021, the effect of this policy framework on the institutes' OA figures has been monitored. Now, 90% of the "referenced" academic publications by the NWO institutes are freely accessible to all.

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

3.4.3 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 number of citations and more emphasis on other domains in which scientists work, such as education and social impact. This broader form of recognition and valuing fits better with the current core tasks of knowledge and education institutes and with what society demands of them.

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. In three discussion sessions, the committee engaged with employees and sought input on the vision and recommendations.

The committee will finalize the vision over the course of 2022, after which the implementation phase will start 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 therefore committed to garnering both national and international support.

3.4.4 Diversity and inclusion

NWO-I wants to be an organization where everyone feels welcome, can be themselves and can get the best out of themselves and 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.

3.4.5 Knowledge security and cybersecurity

The research at the NWO institutes is of a very high quality, thanks in part to international cooperation and the attraction of scientific talent from all around the world. An open science system with important academic values such as openness, scientific integrity and academic freedom. At the same time, there has been a global resurgence in political power struggles between states, where obtaining high-quality knowledge is an important objective for economic and military reasons. This has implications for the Netherlands' security policy and could also affect our innovative strength and competitiveness.

In 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 also contributed. The guideline addresses a great many dilemmas: how to prevent risks such as the undesired transfer of knowledge and technology to other countries, undesired (secret) influence from abroad, cyber espionage and cyber sabotage where access to one's own files is denied? How do you deal with ethical issues, such as cooperating with countries where fundamental rights are not respected? How do you find the right balance between protecting research results and making them freely available to a wider public, such as through open access? NWO-I established an internal working group in 2021 to work out its own policy on this topic and to focus on the drafting of practical guidelines and manuals for researchers. An awareness campaign has been launched to educate scientists about the rules and risks.

NWO-I took far-reaching measures to increase cybersecurity across the organization in 2021. Strengthening central expertise was a must. In 2021, external experts were engaged for this purpose, including an interim CISO who was also given the role of quartermaster for setting up governance around security. A quick scan was also performed to identify what the maturity level of the organization was at that time and to determine the level of ambition. NWO-I has set itself the ambition to, like universities, reach 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 objectively determine whether there are any "lacunae" in the security of the IT infrastructure that require immediate attention. The question of whether we might already be compromised (*compromise assessment*) is part of this analysis. Based on the findings, follow-up steps will be determined for each institute and priorities will be assigned.

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 in 2021. 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 €4.765 million 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 2021.

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	2018	Publications intended for scientists
- of which in "referenced" journals	1624	Articles in journals that use a peer-review system independent of the editors
- Of which in other journals	394	For example, conference proceedings, but not posters or lectures
Contributions to books	38	Contributions to books that target an audience of scientists and researchers
Monographs	14	Books for scientists and researchers describing results of research
Doctoral theses	87	Dissertations
Professional publications and products	128	Products of scientific research aimed at disseminating knowledge to a wider professional audience (contributions to books, reports, software, CD-ROMs, etc.)
Patents	0	Officially registered patents or patent applications
Other	765	All other publications, this includes algorithms, software, data collections, etc.

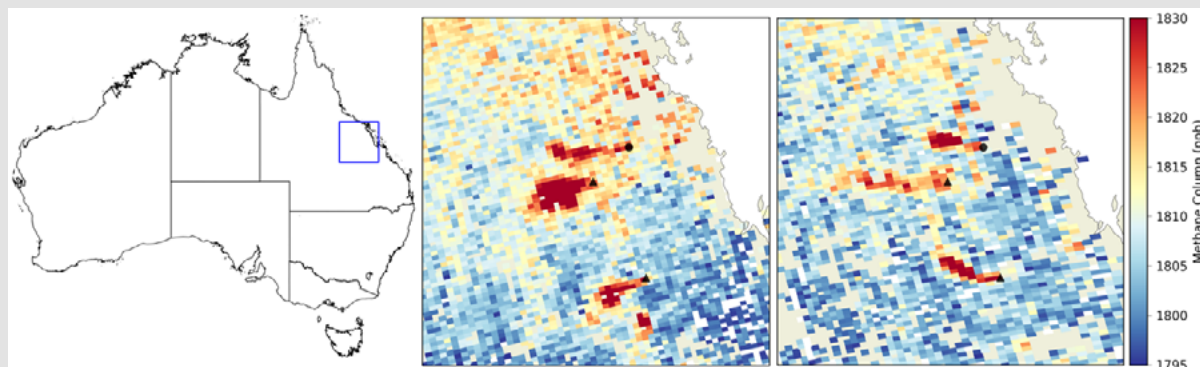
The output indicators mentioned above illustrate the concrete contributions made by the NWO institutes. At the same time, they provide little insight into the - in many respects much more important - contributions that the institutes make to the knowledge field and the Dutch knowledge economy via the 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.

3.7 Geopolitical situation after balance sheet date

On February 24, 2022, Russian troops invaded Ukraine. The armed conflict that has continued since then 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). Cooperation with organizations in Russia and Belarus has been 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 several of our 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.

Dutch satellite reveals much larger methane emissions from Australian coal mines than expected based on national reports

A Dutch group of scientists used the Dutch space instrument TROPOMI to calculate methane emissions from six Australian coal mines. Together, these mines account for 7% of the national coal production. It turns out, however, that they account for some 55% of Australia's total reported methane emissions from coal mines. "It is hard to believe that 7% of coal production is responsible for 55% of coal mine methane emissions," says research leader Professor Ilse Aben (SRON/VU). "This suggests that in reality, emissions from Australian coal mines are probably much higher than reported. And more importantly, we now know which mines are such big emitters, so we can focus our efforts more effectively on reducing their emissions." First author Pankaj Sadavarte (SRON/TNO): "The most striking finding is that emissions from Hail Creek, an above-ground mine, are so much higher than expected. Hail Creek accounts for 40% of emissions from all six mines studied combined. While it is widely assumed that above-ground mines emit far less methane than underground mines." Methane observations from TROPOMI on two different days clearly show three coal mine locations.



Credit: SRON

4 Finances

The organization's financial figures are healthy at the end of 2021. In addition to their fixed state funding, the institutes managed to secure some 36% of the total income in competition or from public and private partners.

The result for 2021 was negative €2,785k. The budgeted result was negative €19,115k. The improvement relative to the budget is due to incidental factors, including the contribution for the Coronavirus Fund in 2021 of €3,193k, the expenses of which will follow in the years ahead, a different way of accounting for the costs of SRON's new building, and a different execution of research over time. The organization's equity at the end of 2021 was €91,840k and the balance sheet total was €290,554k. Solvency was 32%. The working capital amounted to €5,977k.

4.1 Financial developments in 2021

4.1.1 Developments in the financial position

The balance sheet total at the end of 2021 was €290,554k, a net decrease of €1,826k compared to the position at the end of 2020 (€292,380k). On the one hand, this movement is explained by an increase in Fixed assets (€19,969k) due to investments in new construction and a decrease in Current assets (€21,795k).

The movement in Equity related to the result in the current fiscal year. The change in Provisions amounted to €1,010k, of which the releases and withdrawals exceed the allocation in the year. The movement in long-term liabilities related to an Investment grant for the new SRON building (€3,500k) and the annual release to cover depreciation costs (€6,608k). The current liabilities changed (€5,085k), of which €3,092k related to Grant projects received in advance and €2,404k to an increase in Accounts payable (see table 4.1.1).

Table 4.1.1 Balance sheet total 2021 (x €1,000)

	12-31-2021	2021 Budgeted	12-31-2020
	x €1,000	x €1,000	x €1,000
Assets			
Fixed assets			
Intangible fixed assets	3,992	3,787	2,268
Tangible fixed assets	169,575	197,190	151,089
Financial fixed assets	1,997	2,112	2,238
	175,564	203,088	155,595
Current assets			
Receivables	54,590	35,141	30,269
Liquid assets	60,400	12,966	106,516
	114,990	48,107	136,785
Total assets	290,554	251,195	292,380
Liabilities			
Equity	91,840	66,122	94,633
Provisions	10,299	10,789	11,309
Long-term liabilities	79,402	77,233	82,510
Current liabilities	109,013	97,051	103,928
Total liabilities	290,554	251,195	292,380

Table 4.1.2 Financial key figures NWO-I

RATIOS	12-31-2021	2021 budgeted	12-31-2020
- Solvency	32%	26%	32%
- Balance sheet total	290,554	251,195	292,380
- Working capital	5,977	- 48,944	32,857
- Current ratio	1.05	0.50	1.32

The working capital is the difference between current assets and current liabilities. NWO-I's working capital decreased by €26,880k in 2021, which is mainly the result of the decrease in Liquid assets in connection with investments in new construction.

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 2021 was 1.05, which was lower than at the end of 2020. 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, the plan is to take out a long-term loan from NWO in 2022.

Table 4.1.3 Liquid assets according to cash flows

Liquid assets according to funding flows	12-31-2021	12-31-2020
	x €1,000	x €1,000
- Cash flow from operating activities	- 17,232	7,696
- Cash flow from investing activities	- 28,884	- 31,150
- Cash flow from financing activities	-	-
- Other balance sheet movements	-	-
Movement in liquid assets	- 46,116	- 23,454

The liquid assets decreased in 2021 by €46,116k from €106,516k to €60,400k. Cash flow from operating activities resulted in a net decrease in liquidity of €17,232k, mainly as the result of the net income and expenditure corrected for depreciation and provisions (€9,362k), a decrease in Receivables (€24,322k) and a decrease in Liabilities (€2,282k). Cash flow from investing activities relates to investments in tangible fixed assets (€30,296k), investment in intangible fixed assets (€2,020k) less the receipt of the investment grant of €3,500k for the new SRON building.

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 5 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 October 2021. The starting point of the treasury function is that NWO-I monies may not be invested or used to borrow money on. All liquid assets are held at the Ministry of Finance by means of Treasury Banking, with the exception of a specific bank account for the benefit of SRON and a US dollar account at CWI.

There were no long-term loans in 2021. Included under the item Long-term loans are investment grants received in advance.

4.1.3 Developments in income

NWO-I receives its basic grant largely from NWO. This so-called State contribution was 64% of the total income. NWO-I also secures grants competitively. These amounted to about 33% of the total income. NWO-I also acquires Other income, which accounted for 3% of the total income. Of the grants secured competitively, some 43% came from NWO and 22% from International organizations such as the European Union and ESA, 9% 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 and 9% from companies.

How did the income develop in 2021?

The realized income in 2021 exceeded the budget by €15,496k (see Table 4.1.4).

The associated state contribution was €13,496k higher than budgeted, which is due to a contribution for the Coronavirus Fund (€3,193k) and a higher contribution for SKA funds (€9,868k). The income under Government contributions and grants was €563k lower than budgeted. In contrast, Income from work for third parties was €5,441k higher than budgeted, due to new projects, and Other income was €2,878k lower than budgeted, partly due to the delayed start-up of some projects.

The income in 2021 was €6,562k higher than the income in 2020. This was due to a higher State contribution of €11,159k (€13,400k of which was SKA funds) and less Income from work for third parties (€4,031k). The latter is mainly related to the expiration at the BUW, where a decrease of €2,686k occurred due to discontinued activities.

Table 4.1.4 Budgeted and realized income and expenditure 2021 (x €1,000)

	2021	2021 Budgeted	2020
	x €1,000	x €1,000	x €1,000
Income			
State contributions	136,772	123,276	125,613
Other government contributions and grants	1,849	2,412	1,864
Income from work for third parties	70,896	65,455	74,927
Other income	5,543	8,421	6,094
Total income	215,060	199,564	208,498
Expenses			
Personnel expenses	138,908	136,064	137,070
Depreciation	6,829	8,999	5,424
Housing expenses	15,348	21,802	8,784
Other expenses	56,516	51,788	48,587
Total expenses	217,601	218,653	199,865
Balance of income and expenditure	- 2,541	- 19,090	8,633
Financial income and expenditure	10	-	-15
Result	-2,531	-19,090	8,618
Taxes	-	-	-
Result from participating interests	-254	-25	-13
Result after taxes	-2,785	-19,115	8,605
Third-party share in result	-	-	-
Total net result	-2,785	-19,115	8,605

4.1.4 Developments in expenditure

The total expenditure in 2021 was €1,052k lower than budgeted, of which:

- Personnel expenses were €2,844k higher, of which €942k lower direct personnel expenses and €4,066k higher Other personnel expenses.
- Depreciation expenses €2,170k lower, mainly due to the renovation at Nikhef which started later.
- Housing expenses were €6,454k lower. The budget included expenditures for SRON for the New Building which were partly included as expenses, even though these were capitalized in 2021 and are being depreciated.
- Other expenses were €4,728k higher, mainly due to an advance payment of €10,206k to the SKA organization. An additional contribution was received for these higher expenses as well, thus largely covering the result in the year under review.

4.1.5 Developments in the result and equity

The result was negative €2,785k, while the budget had assumed a negative result of €19,115k. The difference is caused by higher income (€15,496k) on the one hand and lower expenses than budgeted (€1,052k) on the other.

The result moves the equity mainly in the earmarked reserves, for example because research funds received are spent later than when they were received, such as at the end of FOM's granting activities. The appropriation of the result does not create problems because the equity components involved are of a sufficient level to accommodate the result appropriation. Part of the result was positive (€1,738k) and is being added to the other legal reserves as a result of capitalizing intangible fixed assets.

4.1.6 Description of the key risks and uncertainties

The risks that are classified as "high" are:

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

Table 4.1.6. 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 NWO-I faces. 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. 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 in accordance with the cycle shown in Figure 4.1.5.

Figure 4.1.5 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 2021 evolved?

The NWO-I 2020 financial annual report had mentioned a number of financial risks for 2021. The status of these risks is as follows:

- Operating costs of the new NIOZ fleet scheduled for purchase and the office deficit - Decisions were made in mid-2021 for financing the new NIOZ fleet and the structural office deficit.
- The SPICA Safari project with SRON as international "Principal Investigator" for the far-infrared spectrometer Safari was committed to ESA, but the funding for SRON had not yet been finalized. Meanwhile, ESA and JAXA have jointly decided not to select SPICA Safari as a new mission. This eliminates the financial risk.
- Impact of SRON's move. The main risk concerned the possible overrun of the construction cost budget. The new SRON building has now been completed. Construction remained within budget. The (limited) residual risk concerns friction costs due to relocation and loss on account of the delayed start of projects. However, the operational costs of the new housing are higher than expected, this concerns management costs (maintenance of installations/inventory), energy costs, real estate tax and municipal taxes.
- NWO-I was yet to receive commitment from NWO/OCW in early 2021 for 2021 salary compensation to accommodate the 1.4% increase in salary costs due to the 2020 CLA (collective labor agreement) concluded in early 2021. In September 2021, the Executive Board awarded the salary compensation. This eliminates this financial risk.
- The NWO-I Office budget is not fully covered from 2022 onwards. At the beginning of 2021, the NWO-I Operations Development program and "fit for purpose" NWO-I Office was launched with the goal of improving the quality of operations and achieving savings to balance the budget of the NWO-I Office for the coming years.

What are the generic/strategic risks?

The generic and strategic risk were evaluated in March 2022 and adjusted where necessary. These strategic risks have been quantified based on classification in three categories: high, medium and low. This classification is being reported on and managed.

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 along with the financial reporting and project portfolio are discussed with the management of each institute every six months. Of course, this will also include scientific developments and personnel developments.

What are the financial and other risks for 2022 and beyond?

Table 4.1.6 - Generic and Strategic Risks NWO-I

Risk	consequence	cause	existing control measures	positioning of risk
Digital intrusion at NWO-I.	Disruption of operations and/or scientific research, damage compensation, threat to knowledge security, reputational damage.	Unsuitable, outdated security allowed undesired 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 replace/update (major) infrastructure.	Major impact on the scientific program.	Insufficient funding available (either from NWO-I or from external funding).	The NWO-I Foundation Board will investigate whether NWO-I funds can be made available for the co-financing of large scientific infrastructure, which the NWO-I Board can decide on 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. Can result in dissatisfaction, staff turnover and high workload and stress among employees. Can 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
Data breaches.	Reputational damage, potential damage to and breach of privacy for 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 National Knowledge 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

see overleaf for table continuation

Risk	consequence	cause	existing control measures	positioning of risk
Integrity breaches or violations of codes of conduct.	Reputational damage. NWO-I must answer to its users stakeholders for any integrity breach. 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
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 throughout the project.	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.	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 managed. 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.	Make proper arrangements in advance and assess 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 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:

- The effects of inflation, including rising energy costs at the institutes
- The situation in Ukraine

4.2 Multi-year budget

The NWO-I Foundation Board adopted the 2022-2026 consolidated multi-year budget on October 12, 2021. This budget was approved by the NWO Executive Board on October 29, 2021. 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 known at the time and on the applicable accounting policies.

4.2.1 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 2022 is budgeted at €220,020k. In the 2022 budget, NWO-I assumes grants and contracts that have already been secured. In addition, estimates were made of the benefits NWO-I will acquire for new programs and projects. In general, this reduces the income on 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 funds for salary and price compensation for 2021, a real estate fund for the NWO-I foundation and a contribution from OCW to offset costs due to the Coronavirus pandemic. The funds that ASTRON receives for the Dutch contribution to SKA have been expedited, allowing for accelerated

remittance and inflation risks to be averted. This de facto increases the Dutch relative contribution to SKA, which is beneficial for the Dutch science and business sectors.

4.2.2 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 corona crisis. (Table 4.2.1).

Table 4.2.1. Statement of income and expenditure

(amounts x €1,000)	Approved budget 2021 x €1,000	Realization 2021 x €1,000	Approved budget 2022 x €1,000	Budget 2023 x €1,000	Budget 2024 x €1,000	Budget 2025 x €1,000	Budget 2026 x €1,000
Income							
State contributions	123,276	136,772	145,409	124,887	123,799	123,920	123,960
Other government contributions and grants	2,412	1,849	49	-	-	-	-
Income from work for third parties	65,455	70,896	67,888	66,437	66,476	64,864	64,247
Other income	8,421	5,543	6,674	6,793	7,004	7,108	6,980
Total income	199,564	215,060	220,020	198,117	197,279	195,892	195,187
Expenses							
Personnel expenses	136,064	138,908	134,541	128,821	125,914	124,017	122,717
Depreciation/amortization	8,999	6,829	9,609	10,018	12,599	12,467	12,180
Housing expenses	21,802	15,348	13,597	13,244	13,881	13,441	13,471
Other expenses	51,788	56,516	65,984	54,691	50,856	47,947	47,969
Total expenses	218,653	217,601	223,731	206,774	203,250	197,872	196,337
Balance of income and expenditure	- 19,090	- 2,541	- 3,711	- 8,657	- 5,971	- 1,980	- 1,150
Realized revaluation	-	-	-	-	-	-	-
Financial income and expenditure	-	10	- 3	-	-	-	-
Taxes	-	-	-	-	-	-	-
Result from participating interests	- 25	- 254	-	-	-	-	-
Result after taxes	- 19,115	- 2,785	- 3,714	- 8,657	- 5,971	- 1,980	- 1,150
Third-party share in result	-	-	-	-	-	-	-
Total net result	- 19,115	- 2,785	- 3,714	- 8,657	- 5,971	- 1,980	- 1,150

The most notable developments in this budget are:

- The main reasons for decreasing income in the period 2022-2026 (-€24,833k) are structural (-€3,512k) and incidental components in the basic grant (-€17,878k) and the expiration of granting obligations via the BUW (-€3,492k). This is also reflected in lower charges.
- The item Income from work for third parties includes:
 - specific project grants such as NWO-I Major (NWO-groot en de Vernieuwingsimpuls Venis, Vidis, Vicis) implemented by the institutes;
 - income on account of projects funded by the European Union projects from the framework programs and by the European Research Council (ERC);
 - income from businesses from PPP projects and contract research at the institutes.
- Expenses decreased by €27,394k due to incidental components such as the contribution to SKA, the expiration of programs and projects in the BUW and the expiration of third-party funded projects at the institutes.

- The negative result (-€3,714k) is mainly caused by the earmarked reserves catching up with the expiring granting obligations.

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 2023

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 2023. In 2021, the total amount of granting obligations decreased from €9,722k to €3,458k.

Granting obligation NWO-I (amounts x €1,000)	12-31-2020	Movement 2021	12-31-2021
Of which to be financed at the expense of future NWO budgets	9,722	- 6,264	3,458
Total granting obligation NWO-I	9,722	- 6,264	3,458

Organizational units (amounts x €1,000)	12-31-2020	Movement 2021	12-31-2021
DIFFER	431	- 431	0
NIKHEF	2,172	- 1,736	436
BUW	6,764	- 3,708	3,056
GENERAL	355	- 389	- 34
Total NWO-I	9,722	- 6,264	3,458

4.2.3 Investment plans and circumstances affecting the budget

4.2.3.1 Nikhef renovation

A total of €39,000k is required for the renovation of Nikhef. 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).

4.2.3.2 Expiration of the BUW

Research activities within the BUW were granted under the former granting function of the FOM foundation. As a result of its phasing out, the size of the BUW is decreasing. The workforce decreased from an average of 179 FTE in 2020 to an average of 116 FTE in 2021. The BUW projects are expected to end by mid-2023.

4.2.3.3 Effects of the Coronavirus crisis

The effects of the Coronavirus crisis are described in Chapter 4.1.6 Description of key risks and uncertainties: uncertainty surrounding the Coronavirus crisis.

NWO-I secured various funds to mitigate the effects of the COVID-19 pandemic, for example NWO provided a budget of €6,000k and a budget of €815k 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. The fund is intended to provide institutes with financial support in

situations where the research costs exceed the income as a result of the Covid-19 outbreak. The funds from the NPO administrative agreement are specifically intended for the renewal of contracts of temporary researchers who incurred delays due to the Covid-19 situation. In Chapter 5, we report on the renewals made from this fund.

4.2.4 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 Notes on the statement of income and expenditure in the financial statements.

NWO-I's 2022 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 earmarked reserves at the institutes being caught up. 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 the implementation of projects that were delayed due to the Coronavirus crisis for 2022 and beyond. The latter effects were not taken into account in the Equity and liquidity tables below.

Equity (amounts x €1,000)	12-31-2021	2021 budget	2022 budget	2023 budget	2024 budget	2025 budget	2026 budget
Equity	91,840	66,122	78,345	69,687	63,717	61,737	60,587

The budgeted decrease in equity also has implications for the projected position of the liquid assets. Liquid assets are decreasing due to large capital expenditures in 2021 and subsequent years. Because negative liquidity is expected from 2022 onward, a loan has been agreed with NWO to finance major capital expenditures totaling €120,000k. This can accommodate the anticipated deficit. This loan agreement has yet to be formalized.

Liquidity

Liquidity (amounts x €1,000)	2021	2021 budget	2022 budget	2023 budget	2024 budget	2025 budget	2026 budget
Starting balance		95,831	75,006	51,333	46,088	59,773	52,917
Revenues		195,162	224,222	198,958	197,630	196,385	194,239
Expenditure		278,027	247,895	204,203	183,945	203,241	192,010
Final balance according to balance sheet	60,400	12,966	51,333	46,088	59,773	52,917	55,146

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 increase in the coming years by €40,887k compared to the position at the end of 2021, mainly due to the capitalization of various large capital expenditures for the fleet renovation, new SRON building and renovation of Nikhef. 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 4.2.2. shows the projected development of income and expenditure through 2026. The budgeted expenses are higher than the income, which results in 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.

The most important result that is not covered is the catching up of the spending backlog at the BUW. The income for this expenditure was budgeted in the past.

Balance sheet

Balance sheet	2021	2021 budget	2022 budget	2023 budget	2024 budget	2025 budget	2026 budget
Intangible fixed assets	3,992	3,787	3,365	2,527	1,689	868	272
Tangible fixed assets	169,575	197,190	208,242	233,858	260,138	255,083	240,741
Financial fixed assets	1,997	2,112	1,782	1,743	1,705	1,666	1,627
Fixed assets	175,564	203,088	213,389	238,128	263,532	257,617	242,640
Receivables	54,590	35,141	34,309	33,487	33,153	32,690	33,655
Liquid assets	60,400	12,966	51,333	46,088	59,773	52,917	55,146
Current assets	114,990	48,107	85,642	79,575	92,926	85,607	88,801
Assets	290,554	251,195	299,031	317,703	356,458	343,224	331,441
General reserve	659	740	721	721	721	721	721
Earmarked reserve	85,839	65,237	73,472	66,417	61,285	60,126	59,572
Earmarked fund	1,350	145	797	32	32	32	32
Other legal reserves	3,992	-	3,355	2,517	1,679	858	262
Equity	91,840	66,122	78,345	69,687	63,717	61,737	60,587
Provisions	10,299	10,789	11,064	10,836	10,607	10,573	10,501
Long-term liabilities	79,402	77,233	103,515	131,937	179,476	170,015	160,557
Current liabilities	109,013	97,051	106,107	105,243	102,658	100,899	99,796
Liabilities	290,554	251,195	299,031	317,703	356,458	343,224	331,441

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.

Personnel (Average number of employees FTE)	2021	2021 budget	2022 budget	2023 budget	2024 budget	2025 budget	2026 budget
Permanent appointments	902	899	870	859	858	855	849
Temporary appointment	783	659	737	694	668	666	671
Total	1,685	1,558	1,607	1,553	1,526	1,521	1,520

Personnel (Average number of employees FTE)	2021	2021 budget	2022 budget	2023 budget	2024 budget	2025 budget	2026 budget
Executive Board/Management	19	20	20	20	20	20	20
Personnel in primary process/ scientific positions	951	874	898	860	838	833	834
Support staff/ other employees	715	664	689	673	668	668	666
Total	1,685	1,558	1,607	1,553	1,526	1,521	1,520

The above breakdown of personnel is based on the Dutch Accounting Standards published by the Dutch Accounting Standards Board, 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 4.1.6 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, being the supervisory body of NWO-I.

Continuity

NWO-I has already taken various measures to ensure the continuity of activities, but will continue to closely monitor developments in the coronavirus outbreak and take additional measures where necessary.

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 2021.

5.1 Vision of human resources policy

To be able to realize the groundbreaking research in our institutes, NWO-I must be able to attract and retain talented people in science, technology or business management. NWO-I aims to be an inclusive employer for 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 HRM policy and ensure the use of appropriate HRM tools while taking into account the specific context of each institute. Throughout 2021, work was done on a new strategic framework for the HR policy that will be adopted in 2022. In the period 2022-2026, the focus is on the themes of labor market, leadership, vitality, learning & development, performance monitoring, inclusivity and HRM analytics. A number of these topics are highlighted below.

Positioning as an attractive employer

It is increasingly important for an employer to have and maintain a positive image in the labor market. NWO-I aims to be an attractive employer for talented individuals in science, technology, and business management through the implementation of modern HRM policies. Establishing and maintaining strategic human resource planning is essential for NWO-I to differentiate itself and effectively navigate the labor market for each target group. By including scenarios for the future in terms of capacity and job development and by proactively anticipating and approaching the labor market in a targeted manner, NWO-I will be better able to secure sufficient employees with the right levels and qualities to contribute to the realization of NWO-I's organizational goals. A target group-specific labor market approach with effective labor market communication is needed. The institutes and the office will each develop and implement their own approach in this regard. In the recruitment process (all the way from recruitment through to on-boarding) we want to ensure an inclusive approach to (potential) employees.

Diversity and inclusion

NWO-I aims to be an organization with a culture that places social safety, inclusion, diversity, and integrity at the center of scientific practice, while recognizing and valuing employees for their unique talents and contributions. NWO-I strives for a workforce composed of employees from different backgrounds and with different talents, who appreciate and embrace each other for the strength of their different perspectives and contributions. NWO-I utilizes the talents of employees in such a way that added value is created for both the organization and the individual employees. Moreover, NWO-I aims to increase the number of women in senior management as well as in scientific and technical positions, and to promote the employment and participation of individuals with disabilities. While increasing diversity has been a key priority for some time, in 2021, steps were taken to develop a new implementation plan for Diversity and Inclusion at NWO-I. This plan focuses both on improving the percentages and cultural change towards a more diverse and inclusive organization. This plan will be adopted and rolled out in 2022.

One spearhead is increasing the number of women in scientific positions at NWO institutes. The institutes have prepared Gender Equality Plans (GEP) with measures to improve the gender balance. The WISE program was established in 2016 for the institutes specifically, and transformed into an employer fund in the fall of 2019 to be more in tune with the institutes' needs. At the end of 2020, the WISE program was also opened up to female engineers at the institutes. This allows the institutes to apply for funding in 2022 and 2023 if they appoint a female scientist or female engineer.

Since 2019, NWO has been a member of Workplace Pride, a foundation dedicated to improving the lives of lesbians, gays, bisexuals, transgender people and intersexuals (LGBTI) at their workplaces. Every year, Tech@Workplacepride organizes an event in a different city in the Netherlands. On November 18, 2021, the LGBTIQ+ conference "Differ(ent) kinds of energy" took place, largely online, at the NWO institute DIFFER, on the campus of Eindhoven University of Technology. This time, the central theme was sustainability and energy transition and the importance of diversity to this mission. Leading scientists and people from the business sector gave lectures suitable for a lay audience on developments in the fields of sustainability and energy, interspersed with stories and reflections on diversity. Speakers came from both inside and outside the LGBTIQ+ community. At the conference, NWO signed the Declaration of Amsterdam, committing the organization to an inclusive corporate culture and integration of LGBTI+ employees.

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). As in previous years, there has been a slight increase in the percentage of women over the past year.

Personnel category	Type of personnel	12-31-2020				12-31-2021			
		FTE	People	%M	%F	FTE	People	%M	%F
Scientific	PhD students	431	435	66%	34%	394	398	63%	37%
	Researchers, temporary	297	318	67%	33%	281	303	65%	35%
	Researchers, permanent	266	290	84%	16%	262	286	82%	18%
Non-scientific	In temporary employment	111	128	69%	31%	116	135	70%	30%
	In permanent employment	598	653	72%	28%	609	665	70%	30%
Total staffing		1,703	1,824	71%	29%	1,662	1,786	70%	30%

As of December 31, 2021, the scientific payroll counted a (rounded) total of 937 FTEs (675 of which were temporary and 262 permanent) and other personnel accounted for a (rounded) total of 725 FTEs, including technicians, IT workers, facilities workers and financial staff (116 temporary and 609 permanent).

The decrease in the number of PhD students compared to 2020 is largely due to the phasing out of the BUW.

As of December 31, 2021, the management of NWO-I, being the directors and institute managers, consisted of 19 FTE: 9 institute directors, including 2 *ad interim*, 9 institute managers and the NWO-I director of operations.

5.2.2 Sickness absence

The sickness absence rate (excluding pregnancy) at NWO-I was lower in the 2021 calendar year than in the previous two years. The average duration of sickness absence cases that ended in the year under review was more or less constant. There is considerable variation among the different organizational units.

Location	Sickness absence rate				Average duration (days)	
	2019	2020	2021	average	2020	2021
AMOLF	3.9%	2.3%	2.7%	3.0%	9.2	11.3
ARCNL	1.5%	1.3%	1.0%	1.3%	6.5	4.5
Astron	4.4%	4.1%	3.8%	4.1%	22	16.9
NWO-I Office	3.4%	7.0%	6.2%	5.6%	16.2	33.0
BUW**	1.2%	1.4%	0.5%	1.0%	26.2	25.9
CWI	2.0%	1.1%	1.1%	1.4%	15.1	17.0
DIFFER	5.2%	3.8%	2.4%	3.8%	20.9	17.5
Dubble	0.0%	0.7%	0.0%	0.2%	5	0.0
Jive	3.8%	2.1%	0.2%	2.0%	17.3	15.0
Nikhef	2.2%	1.9%	0.9%	1.7%	22.2	9.1
NIOZ*	3.5%	2.6%	2.4%	2.8%	9.4	6.3
NSCR	1.7%	2.5%	2.7%	2.3%	9.5	26.6
SRON	3.2%	2.7%	2.1%	2.6%	18.8	15.9
Total NWO-I*	2.9%	2.0%	1.6%	2.2%	16.5	16.1

* 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 exactly which training courses (in terms of content and provider) they will 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.

NWO-I Career orientation provides third and fourth-year PhD students with the opportunity to visit companies. In 2021, an online meeting was held at ASML where NWO-I PhDs, along with PhDs from other organizations, had the opportunity to get a behind-the-scenes look at the work and research conducted at ASML.

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 related to career planning. During their employment, the PhD students are invited to undertake skills training in order to increase their chances of finding subsequent employment after the end of their employment at NWO-I.

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, in cases where 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

On March 24, 2021, the employers KB, NWO and NWO-I and the employee organizations AOb, CVN Government and FNV reached agreement on a collective labor agreement (CLA) for research institutions.

A large number of measures were taken and investments were made by the employers to keep employees involved at work and with each other (socially) during these times, and attention was devoted to safe working conditions and well-being. Based on the parties' agreement in clause 3.12 of the CLA, all three employers agreed with the employee representatives on a remote work allowance/work expense allowance and reimbursement of commuting expenses during the coronavirus crisis.

Salary development

Salary scale amounts were structurally increased by 1.4% effective January 1, 2021. In accordance with the usual system, this increase will be reflected in pensions and benefits.

Work-life balance

Additional birth leave

For the unpaid additional birth leave that took effect on July 1, 2020, the percentage of 70% of the benefit that can be paid for this purpose by the UWV is supplemented to 100% of the salary and up to 100% of the UWV maximum daily wage. The pension contribution allocation of 70%-30% is maintained and leave accrual continues as if it were paid leave.

Bereavement leave

In order to appropriately meet the needs of employees who lose a loved one, in addition to clause 5.8(1a) of the CLA, a bereavement leave guideline is being drawn up for employers and employees by the employers in coordination with the employee representatives. The guideline describes the options for bereavement leave within the framework of leave provisions already existing in the CLA. This takes into account the specific situation of the employee involved and is accommodating in the request for this kind of leave, in the interest of properly accommodating the bereaved employee with the goal of a safe and healthy return to work. Employees are entitled to at least one week of unpaid bereavement leave following the funeral or cremation of a loved one in the first and second degree.

IR

Agreement was reached in 2020 on IR 1 (Commuting expenses) and IR 4 (Study facilities). The start date for the commuting expense scheme was July 1, 2020. As a result of the coronavirus measures and the sharply reduced travel movements from that point on, it was decided, together with the employee representatives, to largely

postpone the introduction of the commuting expense scheme until January 1, 2021. The old scheme remained in place, and of the new scheme only the 100% reimbursement of commuting expenses incurred by public transport was introduced. Agreement was reached with the Central Works Council on continued suspension of the new commuting expense scheme and agreements were made on reimbursing expenses incurred when working from home for the period that the government measures related to the coronavirus pandemic force us to work from home. Because of the coronavirus situation, the aforementioned agreements and associated reimbursements were still applicable at the end of 2021.

5.4 Policy in response to the coronavirus

The global outbreak of the coronavirus and government measures to mitigate it also had a major impact on the work at NWO-I in 2021. Hybrid working became a new reality. Within the institutes, agreements were made about who would be present at what time to conduct experiments, for example. A weekly coordination meeting was also set up between the institute managers and the NWO-I Director of Operations, in which joint policy is ensured where necessary or desired and experiences are shared.

Renewals from the Coronavirus Fund

Shortly after the outbreak of the pandemic, 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 euro 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 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 the contract renewals of temporary personnel, broken down by PhD students and postdocs, funded from NPO resources in 2021.

2021 - Institutes	number of people	number of months	Gross Salary costs	Overhead*	Total costs
PhD students	71	220	€ 1,005,121	€ 502,561	€ 1,507,682
Postdocs	24	73	€ 389,192	€ 194,595	€ 583,787
Total	95	293	€ 1,394,313	€ 697,156	€ 2,091,469

* 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 150 or so temporary researchers working at the universities (University Working Groups Administrative Unit, BUW), 36 people in total received 98 months of contract renewal from the Coronavirus Fund in 2021. The overhead in the table gives an indication of the costs incurred that are not covered from 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 New SRON building

In March 2018, NWO's Executive Board decided to provide funds for the construction of a new building for the NWO institute SRON on the campus of Leiden University. The relocation 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.

The new building was designed by Ector Hoogstad Architects and built by the MedizomZes/Kuijpers construction consortium. Because SRON develops new detection technologies for satellites and builds satellite instruments with great precision, the *cleanroom* has a low-vibration floor. Five thousand cubic meters of concrete, eight hundred tons of reinforcement and three hundred bored piles provide enough mass and stability to keep out virtually any vibration. In addition to the aforementioned *cleanroom*, the building features laboratories, technical areas with crane tracks, a characteristic atrium, grandstand stairs and an eye-catching facade. The building was designed to the standard of the BREEAM Excellent sustainability label. The project was delivered within the comprehensive budgetary framework for construction and relocation.

The original schedule ended up being delayed by a total of 6 months, partly during the design work and partly during the execution phase. The new building was partially taken into use at the end of May 2021. At the beginning of June, the phased relocation of the various SRON units had officially begun with consecutively the Mechanical Workshop, Electronic Assembly and Cryo, the cleanroom portions of Mechanical Assembly and Electronic Assembly and Lithography. All staff departments relocated in September. Due to construction delays, completion was postponed and the relocation started a month later as a result. The relocation schedule was adjusted accordingly and aside from Optics and Lithography, the departments were still relocated within the desired period (around the summer vacation).

The new SRON building on the Leiden campus

Credit: Petra Appelhofd



The official opening of the new building was scheduled for January 12, 2021, with the attendance of the king, but had to be postponed on short notice due to the coronavirus measures in place at the time. Discussions between NWO-I/SRON and Utrecht University on the alienation of the leasehold for the site of SRON's old building on the Utrecht campus were concluded in March 2022: NWO-I/SRON would relinquish the leasehold including buildings, in exchange for compensation from Utrecht University.

6.1.2 Renovation of Nikhef building

The NWO Executive Board decided in 2018 to renovate Nikhef's building at the Amsterdam Science Park. The renovation consists of structural and technical modifications that will ensure that the building is once again well suited to Nikhef's operations. The look and feel will be more modern and the building will be made more sustainable. There will be more space for collaboration and informal meetings in a central location, preserving the tranquility of the other workspaces. Ultimately, there will be a beautiful and future-proof building that students, technicians and scientists will enjoy coming to and that will last at least 20 years.

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 by Strukton Worksphere (SPIE from January 27, 2022, due to acquisition) started in spring 2021. Final completion is scheduled for summer 2023.

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

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 where heat and cold are stored in and extracted from wells in the ground. NWO institute CWI and Nikhef both use the WCW boiler house.

The project was kicked off in 2020. A temporary cooling facility was installed in 2021 to solve urgent cooling needs. A tender was also held for the construction of the plants and wells and the associated technical consultant. The envisioned completion date is mid-2023, roughly the same as the scheduled completion of the renovated Nikhef.

Impressions of the new Nikhef building after renovation

Credit: JHK Architects



6.1.4 Development of strategic real estate plan

NWO-I owns a real estate portfolio spread throughout the country and also leases a number of properties. NWO owns a site at the Amsterdam Science Park and occupies office space in two leased buildings. Major investment decisions such as the recent construction of SRON and the renovation of Nikhef are made and financed on an ad hoc basis.

It is essential to understand future housing needs and the costs of maintenance and investment in the short and Long term. To manage this at the level of the group, a real estate policy is required, laid down in a Strategic Real Estate Plan (SVP). NWO's Executive Board already adopted a number of strategic principles for this at the end of 2018.

The focus in the development of the SVP in 2021 was on setting up and establishing a new real estate maintenance policy, which requires all the institutes to adopt the same methodology of budgeting and accounting. Significant steps were taken in 2021 towards determining this maintenance policy in 2022.

The development of an SVP involves many stakeholders and other parties with a substantive interest. The final responsibility for the development of the SVP lies with the NWO-I director of operations. The substantive fleshing out of the SVP is being led by NWO-I's Real Estate Department. The decision making lies with both the management of NWO-I and the Executive Board of NWO.

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 of possible measures to mitigate it. The results were used to further develop sustainability policies for each institute individually. To this end, each 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.

6.3 Occupational health and safety

NWO-I will issue a separate occupational health and safety annual report for 2021. 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.

6.3.1 Working conditions

The effects of the COVID-19 pandemic remained the largest focus of working conditions at NWO-I in 2021. This concerned both the mental and physical health of employees working from home and the preventive measures in offices and laboratories. These preventive measures were continuously updated based on the latest scientific insights and updated government measures.

With the knowledge gained during the pandemic, information has been developed for employees on how to set up an ergonomic home workplace as part of hybrid working, when working from home is once again optional.

6.3.2 Occupational Health and Safety Catalog

In cooperation with the occupational health and safety experts of the other employers within the WVOI (Employers' Association of Research Institutes), NWO and the Royal Library, several chapters in the Occupational Health and Safety Catalog have been rewritten in order to realign the measures with the latest state of science and technology. The intention is to submit the new texts to the Dutch Labor Inspectorate for review in 2022.

6.3.3 Pilot Dynamic Risk Inventory and Evaluation

A successful pilot was concluded at ARCNL for the Dynamic Risk Inventory and Evaluation. With this form of the RI&E, the risks are not assessed once every few years by a specialist. Instead, employees themselves identify and address the risks on a much more regular basis. This method means that employees are more aware of the risks and there is support for the measures taken. For a dynamic experimental environment, this method ensures that measures are continually tailored to changing and emerging risks.

ARCNL's Occupational Health and Safety Coordinator was interviewed, together with the external consultant, by Verhalen in Veiligheid (Safety Stories) for the podcast - Dynamic RI&E: "a health and safety professional is not a secret agent". An eponymous article was published on Arbo-Online's website.

After the pilot for one working group concludes, the Dynamic RI&E will also be used for other working groups at ARCNL. AMOLF and Nikhef will kick off a pilot for the Dynamic RI&E as well.

6.3.4 Nomination for Good Practices Competition

Nikhef was one of the nominees for the 2021 Good Practices Competition by the European Agency for Safety and Health at Work. The competition was part of the campaign "Healthy work: lighten the load!" Nikhef had submitted their "domkeerder" for this competition, a device developed in the process of constructing the 32 kilo spheres for the KM3Net neutrino detector. With the "domkeerder", Nikhef helps to substantially alleviate the physical stress on employees.

The example of good practice that is Nikhef's story can be read on the Health and Safety website of the Ministry of Social Affairs and Employment and can be listened to on a podcast on that same website.

6.3.5 Working from home in the time of coronavirus

Since the outbreak of the pandemic, NWO-I has been providing facilities to ensure working from home goes as smoothly as possible. For example, IT infrastructure has been adapted and employees at most locations can be loaned the facilities they need to set up their home office, such as an office chair, extra monitor and keyboard. Managers were asked to be extra caring for their team members. A joint policy framework for hybrid work was also worked on during 2021, which will be finalized in early 2022. A key focus in this regard is also on facilitating the design of home workplaces.

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 the first half of 2022, the Executive Board will decide on possible changes based on this analysis.

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, NWO has a structure with an Executive Board and, below it, four domains 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.

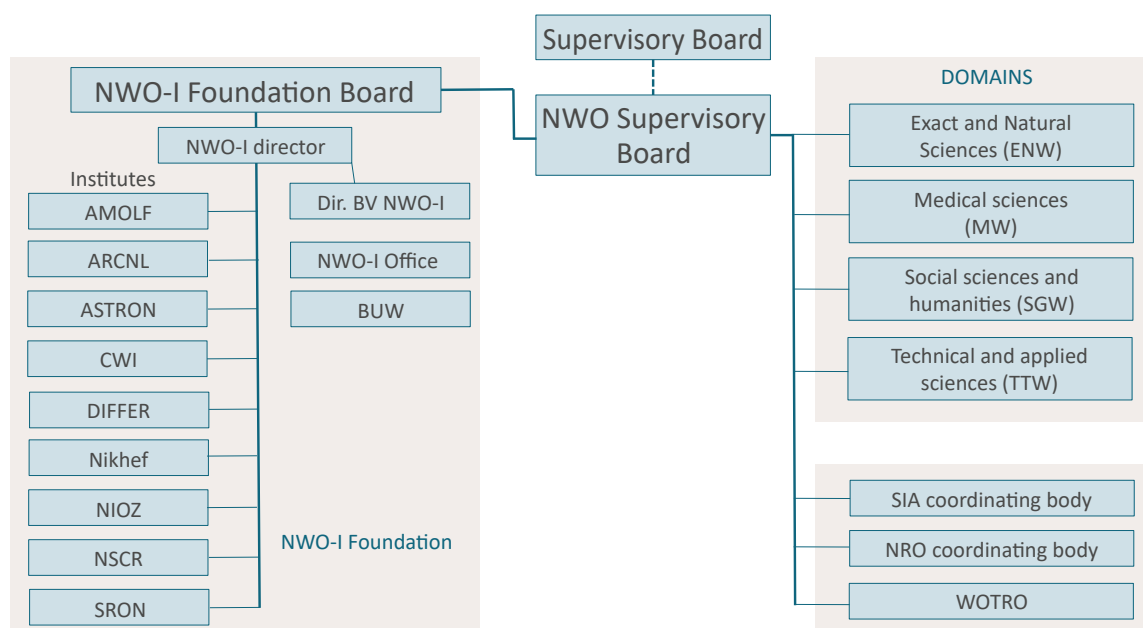
7.2.2 Supervisory Board

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. This committee consisted of two members of the Supervisory Board in 2019. 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. The directors of the institutes 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 strategy to that end. 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 focused 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 110 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 2023, which will mark the moment of dissolution of this organizational unit.

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 institute 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.

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 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) - *(since April 1, 2021) preceded by Professor Stan Gielen - (January 1 - March 31, 2021)*
- Caroline Visser (vice president, portfolio holder Operations and Finance)
- Professor Jan de Boer (president ENW domain)
- Professor Anita Hardon (president SGW domain)
- Professor Margot Weijnen (president TTW domain)
- Professor Jeroen Geurts (president MW domain)

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, NIOZ and NSCR

On November 1, Professor Han Dolman started as director of NIOZ, succeeding Professor Henk Brinkhuis. On November 1, 2021, Professor Beate Völker started as the director of NSCR, succeeding Professor Peter van der Laan. In December 2021, the Foundation Board appointed Professor Jessica Dempsey as the new director of ASTRON effective May 1, 2022.

7.3.2 Employee representation

New employee representation structure at NWO-I

Each of the institutes has its own works council or employee representative body. Following the changes in the governance of NWO-I (see 7.3.1), the employee representation structure was also renewed and formally established in consultation between the director and the representative body on June 7. Since June 2021, the NWO-I Office has its own works council, as does each institute. Until that point, the Office employees had been represented with one seat on the works council of NWO-D.

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 2021.

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.

Based on requests for advice or consent, the Group Works Council dealt with the following topics, among others: privacy policy of NWO-I, hybrid working, engagement of external agency in the NWO-I Operations Development project, deployment of NPO funds for NWO-I.

Prior to June 2021, the employee representation structure was as follows:

NWO-I Office employees were represented on the NWO domain organization works council; one seat in that body was reserved for the NWO-I Office. Delegates from the works councils of the institutes and from the NWO domain organization together formed the NWO Center Works Council. Employees in the BUW directly elected two representatives to the Central Works Council.

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).

In 2021, one complaint was filed by an NWO-I employee under the individual right of complaint. This complaint was taken up and resolved internally prior to handling by the complaints committee, whereupon the employee concerned withdrew the complaint.

NWO-I also has a whistleblower regulation that employees can turn to if they suspect misconduct. The confidential adviser for the whistleblower regulation is Dr Tanja Kulkens. There were no reports in 2021.

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. In 2020, NWO-I adapted the complaints procedure to the new situation and set up a complaints committee. As of December 31, 2021, the complaints committee consisted of the following members:

- Professor R.B. Andeweg
- Dr. Y.P. Kamminga
- Professor E. Van de Vliert

The commission handled one complaint in 2021, which was declared unfounded.

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

At NWO-I, an administrative organization and internal control system (AO/IC) has been agreed upon and is being observed. 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 possible issues for the purpose of 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 which are also revisited in 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 topic (auditee). A draft report is prepared for each audit conducted and is discussed with the auditee for their comments. 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 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 2021, the Supervisory Board held six plenary meetings in the presence of the members of the Executive Board on both internal matters and external developments. Due to the COVID-19 measures, meetings were held via videoconference through the summer. Recurring themes at the meetings included developments at NWO-I and around the portfolio of institutes. The meetings were preceded by a closed meeting without the Executive Board members. A handover meeting was held at the end of March with the incoming and outgoing presidents of the Executive Board. The Supervisory Board held performance reviews with the Executive Board members in April and May. As part of the introductions to the organization, the Supervisory Board had a brief tour in October with a presentation on the research at the NWO institute AMOLF. The president of the Supervisory Board attended the general meeting between the director and the central works council in December.

In preparation for the Supervisory Board meetings, the audit committee met four times with the portfolio holder for operations and finance of the Executive Board and the NWO-I director of operations. These meetings focused on internal control and risk management and NWO-I operations. Both the audit committee and the Supervisory Board discussed findings on the 2020 financial statements, the 2021 management letter and the 2022 audit plan with the external auditors. The audit committee also advised on the impact of the hack and the IT measures taken, the revision of the internal audit charter, progress on the implementation of a new financial system at NWO-I and the 2022 budget.

As of December 31, 2021, the Supervisory Board comprised the following members:

Supervisory board composition on December 31, 2021

- Dirk Jan van den Berg (president)
- Amandus Lundqvist (vice president)*
- Dr. Adriana Esmeijer
- Willem te Beest
- Professor Melinda Mills
- Professor Simone Buitendijk

Term of office until **

April 1, 2025
February 28, 2022
February 28, 2022
February 28, 2022
January 15, 2023
January 1, 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 5 years.

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 also taken in 2021 to strengthen the synergy between the institutes and Office and the effectiveness of the organization. The NWO Executive Board decided in October 2021 on a total package of measures to make the organization financially healthy (see Chapter 2.5). At the end of 2021, the Foundation Board took a preliminary decision to further develop the joint operations. This decision was submitted to the works council, which will issue its advice in 2022.

7.7.2 Commissioning of new financial system

On May 1, 2021, the new financial system was taken into operation, a project that had been years in the making and which marked the organization's transitioned from twelve different administrations in five different financial applications to a single, uniform administration and workflow in one finance system. The new finance system combines financial management, procurement, project and program management. After commissioning, a period followed in which NWO-I's finance employees had to learn to work with the new system.

7.7.3 Developments in operations

In addition to the transition to a single finance system, a structured and ambitious trajectory for the further development of business operations was implemented during 2021 under the direction of the NWO-I management (see also Chapter 2.7). The key reasons for this 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 garner 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 cybersecurity, 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.

With the help of external agency Rijnconsult, a process was carried out to arrive at improvement proposals for various domains in the operations. In this process, a shared vision of business operations with guiding principles was formulated. Additionally, the planning process focused on enhancing the quality of business operations and

achieving efficiency improvements. Through working groups with external guidance, we developed improvement proposals for the eight domains within operations, specifically: management support & strategy, finance, procurement & control, human resources & organization, communication, housing & facilities, occupational health & environment, IT & security and legal affairs including privacy. Based on the improvement proposals, deliberations took place within the Foundation Board and a decision was made in mid-December 2021 on the further development of operations in the form of a proposed decision that was submitted to the NWO-I Group Works Council at the end of 2021. Taking into account the response of the NWO-I Group Works Council, the different improvement proposals will be implemented in 2022 and an organizational plan will be made for the NWO-I Office.

List of abbreviations

ABP	Algemeen Burgerlijk Pensioenfonds [General Pension Fund for Public Employees]
AMOLF	Institute for research into the 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	Centrum Wiskunde & Informatica
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
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	Standard Evaluation Protocol
SKA	Square Kilometer Array
SRON	Netherlands Institute for Space Research
TO2	knowledge institutes for applied research (united in the TO2 federation)



2021 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 14th 2022. In case of any discrepancies or possible differences in interpretation between the English translation and the financial statement prepared on June 14th 2022, 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 objectivess are to:

- a promote excellent science and the quality of scientific research in general;
 - b conduct high-quality scientific research in specific fields;
 - c initiate and stimulate new developments in scientific research;
 - d transfer knowledge from the scientific research that they have initiated, conducted, and promoted, for the benefit of society.
 - e manage institutes;
- 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 14, 2022.

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
 - ILA Microservers BV (100%) in Dwingeloo
- CWI Incubator BV (100%) in Amsterdam
- NIOZ Holding BV (100%) in Den Hoorn
- 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 satisfy the definition of an affiliated party:

	Nature of affiliation
• JIV-ERIC	Joint Institute
• Stichting C.A. Muller Radio Station	Director appointment
• Stichting Lofar	Director appointment
• Stichting International LOFAR Telescope	Founding partner
• Stichting Beheer Wetenschappelijk Centrum Watergraafsmeer	Board participation
• Stichting Netherlands eScience Center	Board participation

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

Monetary assets and liabilities in foreign currency are converted into the functional currency as of the balance sheet date at the exchange rate in effect on that date. Non-monetary assets and liabilities in foreign currency, which are recognized at the historical cost price, are converted into euros at the exchange rates in effect on the transaction date. The exchange rate differences arising on conversion are recognized as income or expense in the statement of income and expenditure.

Transactions in foreign currencies during the reporting period are accounted for in the financial statements at the exchange rate on the transaction date. Conversion differences are recognized directly in the result. NWO-I does not constitute a reserve for conversion differences.

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

Loans granted and other receivables

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 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 initial recognition at fair value less transaction costs and 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 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 cash flow risk

There is no interest rate risk as there are no long-term Loans at the end of 2021. 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 starting point of the treasury rules is that the NWO-I monies may not be invested or used to borrow money on. All liquid assets are held at the Ministry of Finance, with the exception of a specific bank account for the benefit of SRON.

Mandatory System Change

Due to the amendment of DAS 252 Provisions, off-balance sheet liabilities and off-balance sheet assets, these items are measured at present value as of fiscal year 2020, if the effect of the time value of money is material.

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.

For 2021 the interest rate for all maturities was 0%, for the year under review the interest rate up to 10 years is 0% and from 15 years onward interest rates are: 15 years 0.07%, 20 years 0.13%, 25 years 0.17% and 30 years 0.28%.

The term of the provisions at NWO-I is less than 10 years, except for the provision for long-service awards. This provision is presented at nominal value since the difference between present and nominal value (the effect of time value) can be considered immaterial. This applies both for 2021 and retrospectively.

NWO-I has made a calculation both for the Provisions and for the off-balance sheet liabilities and off-balance sheet assets. It was concluded based on this calculation that the effect of the recalculation is not material and that therefore no adjustment of the positions has to take place.

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:

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

Tangible fixed assets

Tangible fixed assets in own use are valued at cost (acquisition or manufacturing price) less accumulated depreciation and, if applicable, accumulated impairments and, if applicable, taking into account a residual value. Contributions received from grantors for the purpose of financing 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: 10%, 15% or 20% per year, depending on economic life
 - Office furniture: 10% per year

- Computer equipment: 20%-25% per year
- Other intangible fixed assets:
 - Vessels: 7.15% 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 used 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 lumpsum. All other maintenance expenses, insofar as they are '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 rest, 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 is 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 an surcharge for indirect costs of personnel expenses. Invoiced instalments / advances received are deducted from the balance of projects in progress.

Grant projects and third-party projects

NWO-I is involved in many and 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 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.

A provision is recognized in the balance sheet when:

- 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 whereby a discount rate of 0% is used.

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 of 2% per year for salary increases and adjusted for the average likelihood of 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 6.26% for 2021, resulting in a likelihood of staying on of 93.74%.
- 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. The discount rate used is 0%.

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 at December 31, 2021. These relate to benefit expenses payable during the maximum term of the benefit period at nominal value. This provision is presented at nominal value since the difference between present and nominal value (the effect of time value) can be considered immaterial.

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 discount rate used is 0%.

Transition payment under the Work and Security Act

NWO-I employees who, after temporary employment, do not leave voluntarily are entitled, in accordance with the Work and Security Act and the complementary Balanced Labor Market Act, to a transition payment. 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 is 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 using a discount rate of 0%. NWO-I's liquid assets are managed by the Ministry of Finance in the context of treasury banking. The current interest rate is 0%.
- 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 five years or less from 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 new 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 date. 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 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 leasehold. 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. This was based on the following principles:

- empirical figures based on costs incurred in the previous disposal of radioactive material;
- external estimate for installation and removal of required sheet piling;
- estimate of other engineer/supervision hours;
- removal of 76 drums of radioactive material;
- indexation of 2.5%.

The estimate includes a 10% contingency because the range of the cost estimate is about 20%.

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

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 at 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. Upon conclusion of the grant, the entire remainder is released and any result is taken. 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, with effect 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 the result

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 have become 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 Pensioenfond 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 pension regulations prescribe a policy funding ratio of 126%, a limit that may be flexible depending on the interest rate and asset portfolio. ABP's year-end 2021 policy funding ratio was 102.8%. An increase of over 9.3%-point compared to year-end 2020, but still below the policy funding ratio. A recovery plan should ensure that ABP gets the policy funding ratio to at least 126% within a maximum of 10 years from 2020. A recovery plan is purely a calculation to be able to decide whether the pensions must be reduced.

Pension funds with a funding ratio of 90% or higher at the end of 2020, were eligible for Minister Koolmees' exemption rule to avoid a pension reduction. ABP took advantage of that possibility. This allows for the recovery period in the recovery plan to be extended from 10 to 12 years. In the calculation of the new recovery plan, the policy funding ratio reaches the required level of 125.8% within 12 years from the end of 2020 (87.6%).

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 contributions already paid by the balance sheet date exceed the pension contributions payable, an asset is recognized under prepayments and accrued income if the fund will refund this amount or offset it against future payable pension contributions.

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 has been 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, 2021 after result appropriation

	12-31-2021	2021 Budgeted	12-31-2020
Assets	x €1,000	x €1,000	x €1,000
Fixed assets			
Intangible fixed assets	3,992	3,787	2,268
Tangible fixed assets	169,575	197,190	151,089
Financial fixed assets	1,997	2,112	2,238
	175,564	203,088	155,595
Current assets			
Receivables	54,590	35,141	30,269
Liquid assets	60,400	12,966	106,516
	114,990	48,107	136,785
Total assets	290,554	251,195	292,380
Liabilities			
Equity	91,840	66,122	94,633
Provisions	10,299	10,789	11,309
Long-term liabilities	79,402	77,233	82,510
Current liabilities	109,013	97,051	103,928
Total liabilities	290,554	251,195	292,380

5 Statement of income and expenditure after result appropriation

	2021	2021 Budgeted	2020
	x €1,000	x €1,000	x €1,000
Income			
State contributions	136,772	123,276	125,613
Other government contributions and grants	1,849	2,412	1,864
Income from work for third parties	70,896	65,455	74,927
Other income	5,543	8,421	6,094
Total income	215,060	199,564	208,498
Expenses			
Personnel expenses	138,908	136,064	137,070
Depreciation/amortization	6,829	8,999	5,424
Housing expenses	15,348	21,802	8,784
Other expenses	56,516	51,788	48,587
Total expenses	217,601	218,653	199,865
Balance of income and expenditure	-2,541	-19,090	8,633
Realized revaluation	-	-	-
Financial income and expenditure	10	-	-15
Result	-2,531	-19,090	8,618
Taxes	-	-	-
Result from participating interests	-254	-25	-13
Result after taxes	-2,785	-19,115	8,605
Third-party share in result	-	-	-
Total net result	-2,785	-19,115	8,605

6 Cash flow statement

	12-31-2021		12-31-2020	
	x €1,000	x €1,000	x €1,000	x €1,000
Cash flow from operating activities				
Balance of income and expenditure	-2,541		8,633	
Adjustments for:				
Depreciation/amortization	12,913		11,399	
Changes in provisions	-1,010		-356	
Interest expenses associated with interest subsidies	-		-	
Change in working capital				
Receivables (-/-)	-24,322		5,054	
Current liabilities	-2,282		-17,019	
Total cash flow from operations	-17,242		7,711	
Interest received	73		24	
Interest paid (-/-)	-63		-39	
	10		-15	
Total cash flow from operating activities		-17,232		7,696
Cash flow from investing activities				
Investments in tangible fixed assets (-/-)	-30,296		-32,549	
Disinvestments in tangible fixed assets	-56		349	
Investments in intangible fixed assets (-/-)	-2,020		-1,986	
Disinvestments in intangible fixed assets	-		-	
Investments in participating interests and/or joint ventures (-/-)	-		-	
Investment grants received in advance	3,500		3,000	
Movements in loans (-/-)	-		-	
Other investments in FVA (-/-)	-12		36	
Total cash flow from investing activities		-28,884		-31,150
Cash flow from financing activities				
Newly taken loans	-		-	
Repayments on long-term liabilities (-/-)	-		-	
Total cash flow from financing activities		-		-
Movement in liquid assets		-46,116		-23,454
Balance at start of fiscal year	106,516		129,970	
Balance at end of fiscal year	60,400		106,516	
Movement in liquid assets	-46,116		-23,454	

7 Notes to the balance sheet

ASSETS

Intangible fixed assets

For the purpose of providing comparative figures, the statement of changes for the fiscal year 2020 is presented in addition to the statement of changes in intangible fixed assets for the fiscal year 2021.

Intangible fixed assets

	Purchase price	Cumulative amortization	Carrying amount	Investments	Taking into use	Disinvestments	Amortization	Other decreases in value +/-	Purchase price	Cumulative amortization + Other downward value adjustment	Carrying amount
	01-01-2020	01-01-2020	01-01-2020	2020	2020	2020	2020	2020	12-31-2020	12-31-2020	12-31-2020
	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
Costs of research and development	859	840	19	2,254	-	-	9	-	3,113	849	2,264
Concessions, licenses and intellectual property rights	-	-	-	-	-	-	-	-	-	-	-
Goodwill	-	-	-	-	-	-	-	-	-	-	-
Prepaid on intangible fixed assets	-	-	-	-	-	-	-	-	-	-	-
Other intangible fixed assets	1,463	1,446	17	-	-	-	13	-	1,463	1,459	4
Intangible fixed assets	2,322	2,286	36	2,254	-	-	22	-	4,576	2,308	2,268

	Purchase price	Cumulative amortization	Carrying amount	Investments	Taking into use	Disinvestments	Amortization	Other decreases in value +/-	Purchase price	Cumulative amortization + Other downward value adjustment	Carrying amount
	01-01-2021	01-01-2021	01-01-2021	2021	2021	2021	2021	2021	12-31-2021	12-31-2021	12-31-2021
	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
Costs of research and development	3,113	849	2,264	-	1,896	-	292	-	5,009	1,141	3,868
Concessions, licenses and intellectual property rights	-	-	-	-	-	-	-	-	-	-	-
Goodwill	-	-	-	-	-	-	-	-	-	-	-
Prepaid on intangible fixed assets	-	-	-	124	-	-	-	-	124	-	124
Other intangible fixed assets	1,463	1,459	4	-	-	-	4	-	1,463	1,463	-
Intangible fixed assets	4,576	2,308	2,268	124	1,896	-	296	-	6,596	2,604	3,992

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 in 2021 of €1,896k relates to the investment in a new finance system. For the new personnel system under development, the expenses amount to €124k.

Tangible fixed assets

For comparative purposes, in addition to the statement of movements in the tangible fixed assets for 2021, the statement of movements for 2020 is also presented.

Tangible fixed assets

	Purchase price 01-01-2020 x €1,000	Cumulative depreciation 01-01-2020 x €1,000	Carrying amount 01-01-2020 x €1,000	Investments 2020 x €1,000	Taking into use 2020 x €1,000	Disinvestments 2020 x €1,000	Depreciation 2020 x €1,000	Other decreases in value +/- 2020 x €1,000	Purchase price 12-31-2020 x €1,000	Cumulative depreciation + Other downward value adjustment 12-31-2020 x €1,000	Carrying amount 12-31-2020 x €1,000
Buildings	164,383	77,061	87,322	634	-92	1,073	5,607	-1,073	163,852	81,595	82,257
Land	3,053	-	3,053	-	-	-	-	-	3,053	-	3,053
Inventory and equipment	96,544	75,213	21,331	2,969	282	1,108	5,339	-1,106	98,687	79,446	19,241
Other tangible fixed assets	9,285	7,448	1,837	20	-	-	431	1	9,305	7,880	1,425
Tangible fixed operating assets under development and prepayments on tangible fixed assets	12,280	-	12,280	33,369	-190	-	-	346	45,459	346	45,113
Tangible fixed assets not in service to operations	-	-	-	-	-	-	-	-	-	-	-
Tangible fixed assets	285,545	159,722	125,823	36,992	-	2,181	11,377	-1,832	320,356	169,267	151,089

	Purchase price 01-01-2021 x €1,000	Cumulative depreciation 01-01-2021 x €1,000	Carrying amount 01-01-2021 x €1,000	Investments 2021 x €1,000	Taking into use 2021 x €1,000	Disinvestments 2021 x €1,000	Depreciation 2021 x €1,000	Other decreases in value +/- 2021 x €1,000	Purchase price 12-31-2021 x €1,000	Cumulative depreciation + Other downward value adjustment 12-31-2021 x €1,000	Carrying amount 12-31-2021 x €1,000
Buildings	163,852	81,595	82,257	2,310	48,413	-	6,832	62	214,575	88,489	126,086
Land	3,053	-	3,053	-	-	-	-	-	3,053	-	3,053
Inventory and equipment	98,687	79,446	19,241	4,180	3,716	18	5,344	-304	106,565	84,450	22,115
Other tangible fixed assets	9,305	7,880	1,425	313	-	-	441	204	9,618	8,525	1,093
Tangible fixed operating assets under development and prepayments on tangible fixed assets	45,113	-	45,113	24,244	-52,129	-	-	-	17,228	-	17,228
Tangible fixed assets not in service to operations	-	-	-	-	-	-	-	-	-	-	-
Tangible fixed assets	320,010	168,921	151,089	31,047	-	18	12,617	-74	351,039	181,464	169,575

The investments in tangible fixed assets in 2021 amounted to €31,047k and can be specified as follows:

- Investment in Buildings, €2,310k, of which €1,694k relates to investments in buildings of NIOZ;
- Investment in Inventory and equipment, €4,180k, of which €2,285k relates to Non-project related equipment (of which €967k is at NIOZ and €584k at SRON), and €1,541k relates to Non-project related computer equipment for regular maintenance, of which €761k at SRON;
- Investment in Tangible fixed operating assets under development and prepayments on Tangible fixed assets, €24,244k, of which €9,372k relates to the Nikhef renovation, €4,628k to the fleet replacement at NIOZ and €9,953k to the New SRON Building.

The depreciation amounts to €12,617k, (2020: €11,377k), whereby the depreciation on Buildings is €6,832k (2020: €5,607k) and Inventory and equipment €5,344k. The depreciation on Other tangible fixed assets amounts to €441k, which mainly relates to the research fleet at NIOZ.

At year-end 2021, the tangible fixed assets amounted to €169,575k, therefore increasing by €18,486k.

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.

Leasehold

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 leasehold 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 leasehold 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 will be used by Nikhef as of June 1, 2019.
The leasehold ends on December 31, 2023.
- Science Park 123 in Amsterdam (Watergraafsmeer, section B, number 4046)
CWI is located on this lot. The leasehold 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 leasehold 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 leasehold ends on December 31, 2023.
- Sorbonnelaan 2 in Utrecht (Utrecht, section N, number 1017)
This lot was home to SRON, but the building is now vacant due to SRON's move to the new building in Leiden. The leasehold formally ends on December 31, 2082. NWO-I is currently in negotiations with Utrecht University to achieve a final surrender of the leasehold (and thus the building) for a one-time fee to be paid by Utrecht University.
- 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 leasehold 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 leasehold 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 leasehold 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 leasehold ends on January 31, 2026.
- De Zaale 20 in Eindhoven (Tongelre, section D, number 1197 (partial))
DIFFER is located on this lot. The leasehold 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 leasehold 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
- Sorbonnelaan 2 in Utrecht SRON
- 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 €686,691k as of January 1, 2021. Approximately €363,505k of this amount relates to buildings.

The property valuation [WOZ-waarde] of the real estate owned by NWO-I is €125,116k (reference date January 1, 2020).

Financial fixed assets

	Carrying amount 01-01-2021	Investments and loans granted 2021	Disinvestments and loans repaid 2021	Other movements +/- 2021	Result from participating interests +/- 2021	Carrying amount 12-31-2021
	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000
Other participating interests	1,517	-	114	-	-139	1,264
Other receivables	721	154	139	-3	-	733
Financial fixed assets	2,238	154	253	-3	-139	1,997

Other participating interests

This concerns the 100% interest in:

- Astrotec Holding BV (ATH) based in Dwingeloo €541k
- CWI Incubator based in Amsterdam €249k
- NIOZ Holding based in Texel, which includes NIOZ Haven BV (100%)
and the participating interest in Control Union Water BV (39%) €440k
- Particle Physics Inside Products BV (P2IP), based in Amsterdam €34k
- Stichting Wiskunde en Informatica Conferenties in Amsterdam (100%) €0k

Other receivables

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

At the end of the year under review, a permanent advance had been made to WCW for €350k. In addition, an investment of €154k was made by CWI in WCW and a prepaid VAT liability of €230k was recognized in connection with ARCNL's housing.

Related parties

	Name	Legal form 2021	Domicile	Code activities	Equity 12/31/2021	Result of year 2021	Total income 2021	Article 2:403 of the Dutch Civil Code	Participation	Consolidation	Intra-group transactions	Liable for corporate income tax or exempt ^{2,4}	Equity December 31, 2020	Result of year 2020	Total income 2020
					x €1,000	x €1,000	x €1,000	Yes/ No	%	%	Yes/ No*		x €1,000	x €1,000	
FOM	Stichting Wetenschappelijk Centrum Watergraafsmeer (WCW)	Foundation [Stichting]	Amsterdam	4	0			No	0%	0%					
FOM	Werkgeversvereniging Onderzoeksinstellingen (WVOI)	Association [Vereniging]	The Hague	4	0			No	0%	0%					
ASTRON	AstroTec Holding BV	Private company [BV]	Dwingeloo	4	541			No	100%	0%	yes	Corporate income tax liable	541	-68	48
ASTRON	Dysi Analytics	Private company [BV]	Assen	4	0			No	17%	0%	no	Corporate income tax liable	0		
ASTRON	Dysi Software Innovations	Private company [BV]	Visvliet	4	0			No	17%	0%	no	Corporate income tax liable	0		
ASTRON	Dutch Sigma	Private company [BV]	Dwingeloo	4	0			No	20%	0%	no	Corporate income tax liable	0		
ASTRON	Sigma Opto-Mechanics	Private company [BV]	Dwingeloo	4	0			No	20%	0%	no	Corporate income tax liable	0		
ASTRON	ILA Microservers	Private company [BV]	Dwingeloo	4	-3			No	100%	0%	no	Corporate income tax liable	-3		
ASTRON	Lofar C.V.	Limited partnership [CV]	Dwingeloo	4	0			No	25%	0%	yes	N/A	0		
ASTRON	Stichting LOFAR	Foundation [Stichting]	Dwingeloo	4	0			No	0%	0%	yes	Corporate income tax liable	0		
ASTRON	JIV-ERIC	ERIC	Dwingeloo	4	0			No	0%	0%	yes	N/A	0		
ASTRON	Stichting CAMRAS	Foundation [Stichting]	Dwingeloo	4	-0	-0	10	No	0%	0%	no	exempt	0		
ASTRON	Stichting International LOFAR Telescope	Foundation [Stichting]	Dwingeloo	4	0			No	N/A	0%	yes	exempt	0		
DIFFER	Coöperatieve Vereniging Milieu TU/e Campus	Cooperative Association [Coöperatieve Vereniging]	Eindhoven	4	71	-7	209	No	0%	0%	yes	Corporate income tax liable	78	58	198

Table of Affiliated parties continued on next page.

Continuation of table: Related parties

	Name	Legal form 2021	Domicile	Code activities	Equity		Result of year 2021	Total income 2021	Article 2:403 of the Dutch Civil Code	Participation	Consolidation	Intra-group transactions	Liable for corporate income tax or exempt **	Equity		Result of year 2020	Total income 2020
					x	x								x	x		
					€1,000	€1,000	€1,000	Yes/No	%	%	Yes/No*			€1,000	€1,000		
NIOZ	NIOZ Holding	Private company [BV]	Den Hoorn	4	440	-170		Yes	100%	0%				610	33		
NIOZ	NIOZ Haven	Private company [BV]	Den Hoorn	4	208	12	333	No	100%	0%				196	1	297	
NIOZ	Control Union Water	Private company [BV]	Den Hoorn	4	653			No	39%	0%				653	-461	245	
NIKHEF	Particle Physics Inside Products (P2IP)	Private company [BV]	Amsterdam	4	34	-20	0	No	100%	0%	no	Corporate income tax liable	54	-49	-2		
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				
NIKHEF	Omics2Image	Private company [BV]	Maastricht	4	0			No	0%	0%			0				
NIKHEF	Sensiflex	Private company [BV]	Amsterdam	4	0			No	0%	0%			0				
CWI	Wiskunde en Informatica Conferenties	Foundation [Stichting]	Amsterdam	4	34			No	100%	0%	no	yes	34	1	133		
CWI	CWI Incubator	Private company [BV]	Amsterdam	4	243	-3	10	No	100%	0%	no	yes	246	5			
CWI	DuckDB Labs	Private company [BV]	Amsterdam	4	0			No	20%	0%	no	yes					
CWI	MonetDB	Private company [BV]	Almere	4	0			No	17%	0%	no	yes					
CWI	MonetDB Solutions	Private company [BV]	Almere	4	0			No	5%	0%	no	yes					
CWI	Spinque	Private company [BV]	Utrecht	4	0			No	22%	0%	no	yes					
CWI	Photosynthetic	Private company [BV]	Amsterdam	4	0			No	30%	0%	no	yes					
CWI	Stokhos	Private company [BV]	Amsterdam	4	0			No	50%	0%	no	yes					
CWI	Seita Energy Flexibility	Private company [BV]	Amsterdam	4	0			No	10%	0%	no	yes					
CWI	Dataspex	Private company [BV]	Amsterdam	4	0			No	8%	0%	no	yes					
CWI	SWAT.holding	Private company [BV]	Amsterdam	4	0			No	25%	0%							
	Stichting Netherlands eScience Center	Foundation [Stichting]	Amsterdam	4	0			No	N/A	0%							
	Coöperatie SURF U.A.	Cooperative [Coöperatie]	Utrecht	4	0			No	N/A	0%							
	Gemeenschappelijke regeling Darwin Centrum voor Biogeologie	Joint Arrangement [Gemeenschappelijke regeling]		4	0			No	N/A	0%							
	Covenant Netherlands Space Office			4	0			No	N/A	0%							
General	Data Archiving and Networked Services			4	0			No	N/A	0%							
General	ESRF			4	0			No	N/A	0%							
	European and Developing Countries Clinical Trials Partnership			4	0			No	N/A	0%							
	European Polar Board			4	0			No	N/A	0%							
General	SKA Organization			4	0			No	N/A	0%							
SRON	Leidse instrumentmakers School	Foundation [Stichting]	Leiden	4	0												
					2,221	-188	562				0			2,409	-480	919	

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

It should be noted that the 2021 annual figures included in this table are draft figures.

The end position for 2020 in this document differs slightly from the stated end position reported in the 2020 financial annual report.

This is because it incorporates the definitive 2020 results, which were not known yet at that time (beginning of 2021).

Legend for Code table: 1. Contract education, 2. Contract research, 3. Real estate, 4. Other

It should be noted that the 2021 annual figures included in this table are draft figures. The end position for 2020 differs slightly from the stated end position as reported in the 2020 Annual Report. This is because this table incorporates the definitive 2020 results, which were not known yet at that time (beginning of 2021).

CURRENT ASSETS

Short-term receivables

	12-31-2021	12-31-2020
	x €1,000	x €1,000
Accounts receivable general	9,511	6,160
Receivables from Municipalities and Joint Arrangements	-	-
Receivables from NWO	5,129	5,891
Receivables from other participating interests	202	478
Receivables from personnel	68	76
Other authorities	-	-
Valuation of Projects in progress	2,169	1,288
Other receivables	12,967	12,692
Taxes and social insurance contributions	3,528	497
Prepaid costs	22,698	4,649
Advances provided	-	-
Interest receivable	-	-
Other prepayments and accrued income	-	33
Less: Provision for irrecoverability -/-	-1,682	-1,495
Receivables	54,590	30,269

Receivables amounted to €54,590k, having increased by €24,321k compared to 2020 (€30,269k).

The largest movements compared to 2020 concern the Accounts receivable (€3,351k), Other receivables (€3,031k) and Prepaid expenses (€18,049k).

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

	NWO	Participating interests	Third parties		NWO	Participating interests	Third parties
Breakdown	12-31-2021	12-31-2021	12-31-2021		12-31-2020	12-31-2020	12-31-2020
	x €1,000	x €1,000	x €1,000		x €1,000	x €1,000	x €1,000
Accounts receivable general	832	391	8,288		407	-	5,753

Valuation of Projects in progress

	12-31-2021	12-31-2020
	x €1,000	x €1,000
Realized billable third-party costs	6,746	4,023
Expected losses -/-	-	-
Invoiced installments -/-	-4,577	-2,735
Valuation Projects in progress (third parties)	2,169	1,288
Valuation of Projects in progress	2,169	1,288

The balance of the valuation of projects in progress with an 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.

Particularly at SRON (€2,169k) a position of Projects in Progress remains.

Other receivables

	12-31-2021	12-31-2020
	x €1,000	x €1,000
Other receivables third parties	1,694	1,626
Other receivables affiliated parties	-	-
Advances on grant projects for third parties	11,272	11,065
Other receivables	12,966	12,691

	12-31-2021	12-31-2020
	x €1,000	x €1,000
Provision for irrecoverability		
Balance as at January 1	-1,495	-1,421
Withdrawal (+/+)	-57	-128
Allocation (-/-)	130	202
Less: provision for irrecoverability	-1,682	-1,495

The prepaid expenses amount to €22,689k and are €18,049k higher than year-end 2020, which includes an increase at ASTRON (€14,469k, contribution SKA) and an increase at NWO-I General (€2,917k, contribution ESRF) on account of ESRF contribution).

The Taxes and social insurance contributions amount to €3,528k and are €3,031k higher than year-end 2020, which includes an increase at SRON (€2,231k, relating to a tax refund in connection with the new construction of the building in Leiden).

The provision for irrecoverability amounts to €1,682k, of which €1,005k at ASTRON, which mainly relates to a receivable from LOFAR (€861k). LOFAR is expected to be dissolved in 2022 and financial settlement will take place.

Liquid assets

	12-31-2021	12-31-2020
	x €1,000	x €1,000
Cash	18	13
Bank account balances	821	654
Current account balance Treasury banking	59,561	105,849
Liquid assets	60,400	106,516

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 €122k which was given to the Tax Authorities/Customs.
- The intraday limit at ABN-AMRO Bank is €10,200k.

The liquid assets decreased in 2021 by €46,116k from €106,516k to €60,400k. This decrease arose largely from investing activities (€26,974k).

Cash flow from operating activities resulted in a net decrease in liquidity of €19,152k, mainly as the result of the net income and expenditure corrected for depreciation/amortization and provisions (€7,452k), a decrease in Receivables (€24,322k) and a decrease in Liabilities (€2,282k).

Cash flow from investing activities relates to investments in tangible fixed assets (€28,386k), investment in intangible fixed assets (€2,020k) less the receipt of the investment grant of €3,500k for the new SRON building.

LIABILITIES

Equity

	Balance as at 01-01-2020	Result +/- 2020	Other movements +/- 2020	Balance as at 12-31-2020
	x €1,000	x €1,000	x €1,000	x €1,000
General reserve	1,460	-842	103	721
Legal reserve	-	-	-	-
Earmarked reserve (public)	82,190	7,540	-115	89,615
Earmarked reserve (private)	-	-	-	-
Earmarked fund (public)	2,375	-332	-	2,043
Earmarked fund (private)	15	-15	-	-
Revaluation reserve	-	-	-	-
Other legal reserves	-	2,254	-	2,254
Reserves under the articles	-	-	-	-
Third-party share	-	-	-	-
Equity	86,040	8,605	-12	94,633

	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
General reserve	721	-62	-	659
Legal reserve	-	-	-	-
Earmarked reserve (public)	89,615	-3,771	-5	85,839
Earmarked reserve (private)	-	-	-	-
Earmarked fund (public)	2,043	-693	-	1,350
Earmarked fund (private)	-	-	-	-
Revaluation reserve	-	-	-	-
Other legal reserves	2,254	1,738	-	3,992
Reserves under the articles	-	-	-	-
Third-party share	-	-	-	-
Equity	94,633	-2,788	-5	91,840

The movements in Equity are the movements based on the appropriation of the net result in 2021. Equity decreased from €94,633k at the end of 2020 to €91,840k at the end of 2021.

The general reserves decreased by €62k to €659k.

The earmarked reserve decreased by €3,776k to €85,839k in 2021.

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 2021 (€2,378k), 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 main decrease occurred within the BUW due to the expiration of the research contracts. The remaining balance of the earmarked reserve within the BUW is €10,892k.

The earmarked public funds decreased by €693k to €1,350k. The remaining balance of earmarked funds consists mainly of the sector plan funds within the BUW (€1,309k).

Earmarked fund (public)

	Balance as at 01-01-2021 x €1,000	Newly granted 2021	Result +/- 2021 x €1,000	Other movements +/- 2021 x €1,000	Balance as at 12-31-2021 x €1,000
	-	-	-	-	-
Sector plan	1,965		-615		1,350
Einstein telescope	78		-78		-
Earmarked fund (public)	2,043	-	-693	-	1,350

The Other legal reserves were required to be formed in 2020 for research and development costs in relation to the investment in the New Finance System and the New Personnel System.

Foundation capital

The foundation capital is €45.38.

Provisions

	Balance as at 01-01-2021 x €1,000	Allocations 2021 x €1,000	With- drawals 2021 x €1,000	Release 2021 x €1,000	Interest movement (for present value) 2021 x €1,000	Balance 12-31-2021 x €1,000	Short-term portion < 1 year x €1,000	Long-term portion > 1 year x €1,000
Personnel provisions	8,276	2,770	-1,931	-1,849	-	7,266	2,905	4,360
Provision for loss-making contracts	-	-	-	-	-	-	-	-
Other provisions	3,033	-	-	-	-	3,033	-	3,033
Provisions	11,309	2,770	-1,931	-1,849	-	10,299	2,905	7,393

Breakdown of Personnel-related provisions	Balance as at 01-01-2021 x €1,000	Allocations 2021 x €1,000	With- drawals 2021 x €1,000	Release 2021 x €1,000	Interest movement (for present value) 2021 x €1,000	Balance 12-31-2021 x €1,000	Short-term portion < 1 year x €1,000	Long-term portion > 1 year x €1,000
Personnel-related provisions								
Provision for social policy, reorganiza- tions and other legal status	1,067	15	-	-152	-	930	152	778
Leave savings and sabbatical leave	-	-	-	-	-	-	-	-
Own risk WGA	-	-	-	-	-	-	-	-
Provision for long-service awards	1,004	75	-55	-42	-	982	104	878
Unemployment contributions	2,050	1,254	-460	-819	-	2,025	751	1,274
Long-term sick	877	156	-394	-414	-	225	131	94
Transition payments	1,953	804	-709	-310	-	1,738	1,127	610
Generation Plan	879	439	-313	-19	-	986	490	496
Other personnel provisions	446	27	-	-93	-	380	150	230
Total personnel provisions	8,276	2,770	-1,931	-1,849	-	7,266	2,905	4,360

The provisions decreased by €1,010k to €10,299k.

Personnel-related provisions

The Provision for social policy, reorganizations and other legal positions amounts to €930k and mainly concerns the reorganization provision which was set up to cover future salary costs of redundant employees.

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

Unemployment contributions

The provision decreased by €24k. The allocation for 2021 amounted to €1,254k, for several employees running through 2030. The withdrawal amounted to €460k and the release amounted to €819k. The balance of unemployment benefits amounted to €2,025k.

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, 2021 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.

This provision was created starting in 2019 and amounted to €225k at the end of 2021.

The Other personnel provisions (€3,104k) consists of:

- €1,739k from the provision for *Transition payment under the Work and Security Act*
- *Other provisions* of €1,365k,

Further explanation below:

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 the employment. This provision decreased by €215k on balance in 2021. The provision at year-end 2021 was €1,739k (2020: €1,953k).

Generation Plan 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 date. The scheme came into effect for the first time with the 2018-2019 CLA for Research Institutions. The balance at year-end 2021 was €1,365k.

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 (remaining balance in 2021 €85k), which contributed in part to the successful launch of the James Webb Telescope on December 25, 2021 (term through 2023).

Other provisions

The item Other provisions within Provisions includes the Provision for remediation of radioactive materials PiMu. 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, 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 leasehold. 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 is

based on reports from external expert parties. An estimation uncertainty exists in the amount determined 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 €1,536k (€1,269k excl. VAT) as receivable from NWO.

Long-term liabilities

	Balance as at 01-01-2021	Loans contracted	Repayments	Balance as at 12-31-2021	Term > 1 year	Term > 5 years
	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000	x €1,000
Investment grants received in advance (long-term)	82,510	3,500	-6,608	79,402	79,402	44,947
Long-term liabilities	82,510	3,500	-6,608	79,402	79,402	44,947

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 2021, a sum of €3,500k was received for the new SRON building in Leiden. 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 €37,584k.

Current liabilities

	12-31-2021	12-31-2020
	x €1,000	x €1,000
Amounts owed to NWO	37,578	35,856
Amounts owed to other participating interests	110	30
Amounts owed to credit institutions	-	-
Amounts owed to Ministry of Finance	-	-
Amounts owed to municipalities and Joint Arrangements	-	-
Pre-invoiced installments Projects	2,146	776
Accounts payable	6,628	4,224
Taxes and social insurance contributions	7,820	7,625
Pensions	1,846	1,666
Liabilities in respect of work for third parties	-	-
Other	8,845	9,374
Investment grants Received in advance (short-term)	6,245	5,590
Amounts received in advance	1,480	1,037
Vacation pay and days	13,962	14,032
Interest payable	-	-
Other accrued liabilities	22,353	23,718
Current liabilities	109,013	103,928

The total of current liabilities is €109,013k and has increased by €5,085k.

Pre-invoiced installments Projects

	12-31-2021	12-31-2020
	x €1,000	x €1,000
Realized billable costs NWO	- 43	-
Expected losses -/-	-	-
Invoiced installments -/-	53	-
Valuation pre-invoiced NWO	10	-
Realized billable third-party costs	-1,468	-1,946
Expected losses -/-	-	-
Invoiced installments -/-	3,604	2,722
Valuation pre-invoiced third parties	2,136	776
Pre-invoiced installments Projects	2,146	776

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 2020, the balance increased by €1,370k, especially at SRON, mainly as a result of higher billable research installments.

Accounts payable

	12-31-2021	12-31-2020
	x €1,000	x €1,000
Accounts payable	6,628	4,224

Compared to 2020, the accounts payable balance was €2,404k higher, of which €853k was at ASTRON (mainly position with Stichting ILK) and €1,873k at Nikhef (incl. invoices to be paid to UVA and to SURF)

Taxes and social insurance contributions

	12-31-2021	12-31-2020
	x €1,000	x €1,000
Payroll taxes	6,748	6,989
Turnover tax	1,072	636
Social insurance contributions	-	-
Other taxes	-	-
Taxes and social insurance contributions	7,820	7,625

Other

decrease of €529k compared to 2020

Investment grants received in advance (short-term)

increase relative to 2020 of €655k.

These grants are updated annually for coverage on depreciation costs.

Other accrued liabilities are the items Other accrued liabilities and Third-party grant projects, according to the specification below:

Other accrued liabilities

	12-31-2021	12-31-2020
Other accrued liabilities	119	598
Grant projects received in advance (credit)	22,234	23,120
Other accrued liabilities	22,353	23,718

The Other accrued liabilities decreased by €1,365k, which mainly relates to Third-party grant projects. 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 €290,554k, which is €39,359k higher than the budgeted balance sheet total.

Below is a brief outline explanation.

Assets

- Fixed assets, €27,524k less than budgeted,
 - o €29,470k Tangible fixed assets
 - €1,707k ASTRON construction of milling machine failing to go ahead,
 - €28,313k NIOZ Fleet replacement, realization later than budgeted
 - +€3,348k Nikhef, renovation of building
- Current assets €66,883k more than budgeted, of which
 - o +€19,449k Receivables, of which €15,549k relates to early contribution to SKA by ASTRON.
 - o +€47,434k Liquid assets, of which €32,048k due to later realization of budgeted capital expenditures.

Liabilities

- Equity, €25,718k more than budgeted.
 - o which is partly explained by the difference with respect to the budgeted result of negative €19,115k, while a negative result of €2,785k was realized.
- Provisions €490k less than budgeted
 - o In particular, the movements at Nikhef, NIOZ and ASTRON (unemployment contributions, Long-term sick and Social Policy scheme)
- Long-term liabilities, €2,169k more than budgeted,
 - o +€3,500k Investment grant received in advance New SRON building
- Current liabilities, €11,962k more than budgeted,
 - o In particular at ASTRON, NIOZ and Nikhef, relating to accounts payable, payables to group companies and Project funds received in advance.

Off-balance sheet rights and liabilities

Off-balance sheet rights (amounts x €1,000)	12-31-2020	Move- ments	12-31-2021	< 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	10	-	-	10
b) Guarantees and sureties, etc., issued	15,822	(2,046)	13,776	1,148	4,488	8,140	13,776
c) Liabilities from orders for tangible fixed assets	16,752	(15,510)	1,242	872	370	-	1,242
d) Other off-balance sheet liabilities	13,112	(2,290)	10,822	7,566	3,026	230	10,822
Future liabilities	-	-	-	-	-	-	-
Fiscal unit for VAT NWO and NWO-I	-	-	-	-	-	-	-
TOTAL contingent liabilities and unrecognized liabilities	45,686	(19,836)	25,850	9,596	7,884	8,370	25,850
2. Long-term financial liabilities							
a) Rights of use and other rights (leasehold, superficies, rental, lease and leasing)	4,291	179	4,470	993	1,909	1,568	4,470
b) Obligations under cooperative arrangements and potential risks of financial setbacks arising from these obligations	214	(86)	128	128	-	-	128
TOTAL Long-term financial liabilities	4,505	93	4,598	1,121	1,909	1,568	4,598
TOTAL Off-balance sheet liabilities	50,191	(19,743)	30,448	10,717	9,793	9,938	30,448

Off-balance sheet rights (amounts x €1,000)	12-31-2020	Move- ments	12-31-2021	< 1 year	2 to 5 years, inclusive	From 5 years onward	Total
1. Contingent rights and unrecognized rights							
a) Claims submitted to third parties	39,791	(2,207)	37,584	1,392	5,568	30,624	37,584
b) Other	3,927	415	4,342	130	400	3,812	4,342
TOTAL Off-balance sheet rights	43,718	(1,792)	41,926	1,522	5,968	34,436	41,926

The amounts included in the statement of off-balance sheet rights and liabilities exclude VAT, and VAT generally increases costs for NWO-I. In accordance with DAS 252, positions must be recorded at present value if the effect of the time value of money is material. Taking into account the currently applicable interest rates, the calculation showed that the effect is not material and that the present value is therefore set at the nominal value, both for the prior and current reporting year positions.

Contingent liabilities and unrecognized liabilities

Claims submitted by third parties

Compared to 2020, the liability increased by €10k, which relates to the eXTP Neways Scoop.

Guarantees and sureties issued, etc.

Compared to 2020, the liability decreased by €2,046k, which included an expiration of €1,278k 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 €13,464k at the end of the reporting year.

A bank guarantee was also issued for ARCNL in the amount of €286k. As part of ARCNL's collaboration with UvA and VU, the financial position of the in-kind contribution was determined at year-end. At year-end 2021, this had decreased by €768k.

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 2020, the liability decreased by €15,510k, of which €15,551k relates to the new building in Leiden. In addition, there are new liabilities of €714k.

Other off-balance sheet liabilities

Compared to 2020, the liability increased by €2,290k, of which an expiration of €5,130k offset by new liabilities of €2,814k. Of this amount, €506k relates to Comprehensive insurance and €673k relates to hiring.

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 2020, 33 user and other rights were updated for a total of €179k.

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.

Already known liabilities decreased relative to 2020 by €86k, of which €75k with VU Amsterdam and SRON.

Off-balance sheet rights

Contingent rights and unrecognized rights

a Claims submitted to third parties

This mainly concerns the New construction of housing in 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).

b Other

At the end of the reporting year, these had increased by €415k, of which €762k relates to the collaboration with ASML, NWO-I, UVA and VU.

8 Notes to the statement of income and expenditure

INCOME

Income

	2021	2021 Budgeted	2020
	x €1,000	x €1,000	x €1,000
State contributions	136,772	123,276	125,613
Other government contributions and grants	1,849	2,412	1,864
Income from work for third parties	70,896	65,455	74,927
Other income	5,543	8,421	6,094
Total income	215,060	199,564	208,498

State contributions

	2021	2020
	x €1,000	x €1,000
State contributions from OCW via NWO	134,074	125,113
Other grants from OCW via NWO	2,698	500
State contributions	136,772	125,613

The total State contributions amount to €136,772k and are €11,159k higher than the position at year-end 2020, mainly for the higher contribution for the SKA organization. (2021 €13,400k, 2020 €1,600k)

Government contributions/grants from other authorities

	2021	2020
	x €1,000	x €1,000
Provincial contributions and grants	83	-30
Other Municipal and Joint Arrangement contributions and grants	14	-7
Other authorities	1,752	1,901
Other government contributions and grants from other authorities	1,849	1,864

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 (€83k) and a Municipal contribution for Nikhef €14k and, on the other, the contribution from Other authorities concerns the Ministry of Economic Affairs (€1,752k).

Income from work for third parties

	2021	2020
	x €1,000	x €1,000
Contract research	67,236	74,111
License revenue	-	489
Other income from work for third parties	3,660	327
Income from work for third parties	70,896	74,927

The total income from work for third parties amounted to €70,896k and was €4,031k less than year-end 2020.

	2021	2020
	x €1,000	x €1,000
International organizations	14,646	13,637
National authorities	6,350	8,663
NWO	28,678	37,033
KNAW	3	-
Other nonprofit organizations	11,263	7,728
Businesses	6,295	7,050
Contract research	67,235	74,111

The income Contract research (€67,235k) decreased by €6,876k compared to 2020, which is mainly reflected in:

- the income from International organizations (€14,636k) increased by €1,009k.
 - In particular at ARCNL (€114k), ASTRON (€313k), DIFFER (€110k), NIOZ (€223k), SRON (€180k) and NWO-I General (€656k, in connection with the conclusion of the DUBBLE project), there was an increase.
 - whereas at AMOLF (€128k), CWI (€49k) and Nikhef (€472k), there was a decrease.
- the income from National authorities (€6,350k) decreased by €2,313k,
 - of which especially at NIOZ (€2,675k, which was offset by higher income from NWO, Other non-profit and projects Businesses
- the income from NWO at year-end 2021 was €28,678k and has decreased by €8,355k, of which €5,094k relates to the NWO expiration of Granting (2020: €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 nonprofit organizations (€11,263k) increased €3,535k,
 - increases occurred in particular at ARCNL (€358k), ASTRON (€303k), Nikhef (€1,786k) and NIOZ (€1,321k).
- the income from Businesses (€6,295k) decreased by €755k.
 - The decrease was particularly visible at the BUW (€1,424k), as a result of expiring activities.

The BUW's income was partially decreasing because of the expiration of Granting, whereby the annual contribution from NWO to fulfill the granting commitments each year will decrease to zero in 2023. The income for projects from 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 also diminish to nil.

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, according 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

	2021	2020
	x €1,000	x €1,000
Rental income	4,344	4,210
Secondment of personnel	357	232
Gifts	-	-
Sponsoring	29	-
Catering revenue	-	-
Other	813	1,652
Other income	5,543	6,094

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. This has thus 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.

Notes on Income versus Budget

Income

	2021	2021 Budgeted	2020
	x €1,000	x €1,000	x €1,000
State contributions	136,772	123,276	125,613
Other government contributions and grants	1,849	2,412	1,864
Income from work for third parties	70,896	65,455	74,927
Other income	5,543	8,421	6,094
Total income	215,060	199,564	208,498

The total income amounted to €215,060k and was €15,496k higher than budgeted.

- The State contribution is €13,496k higher mainly due to:
 - o €3,193k supplementing of Coronavirus funds (NWA and OCW)
 - o €9,868k higher contribution SKA funds
- The Other government contributions and grants were €563k lower.
- Income from work for third parties was €5,441k higher, of which:
 - o €1,899k at NIOZ due to an additional charter
 - o €3,279k at Nikhef due to several new projects which were not budgeted.
- The Other assets were €2,878k lower, of which
 - o €1,989k at ASTRON, due to delayed start-up of a few projects and an overly ambitious budget.

EXPENSES

Expenses

	2021	2020
	x €1,000	x €1,000
Personnel expenses	138,908	137,070
Depreciation/amortization	6,829	5,424
Housing expenses	15,348	8,784
Other expenses	56,516	48,587
Total expenses	217,601	199,865

Personnel expenses

	2021	2020
	x €1,000	x €1,000
Wages, salaries, social insurance and pension costs	124,387	122,179
Other personnel expenses	14,740	15,199
Fees received -/-	-219	-308
Personnel expenses	138,908	137,070

Breakdown

Wages and salaries

Wages and salaries	96,239	96,140
Social insurance costs	12,346	11,629
Pension contributions	15,802	14,410
Wages and salaries	124,387	122,179

Other personnel expenses

Allocations personnel provisions	-890	-100
Non-employee personnel expenses	5,886	5,133
Other	9,744	10,166
Other personnel expenses	14,740	15,199
Other benefits that reduce personnel expenses -/-	-219	-308

The personnel expenses amounted to €138,908k and increased by €1,838k compared to 2020.

- Direct personnel expenses (Wages, Salaries and Pension Expenses) increased €2,208k.
 - Wages and Salaries increase €99k
On the one hand, Wage and price compensation for the 2021 calendar year of €1,965k and a decrease in headcount at the BUW (63 FTE)
 - Pension premiums increase of €1,392k, mainly as a result of a higher premium rate
- Other personnel expenses (€14,740k) decreased €459k compared to 2020.
 - Movement in personnel provisions decrease €790k, of which a decrease at NIOZ (€1,520k, of which €851k lower allocation and €632k lower release, mainly within the provision for unemployment contribution and the provision for Long-term sick) and an increase at SRON (€823k, of which €408k unemployment contribution allocation)
 - Non-employee personnel expenses, increase €753k
 - Other, decrease €422k

The average number of FTE during the reporting year was 1,685, which is 53 FTE less than the average of the previous year. In particular, the BUW showed a decreasing workforce (average 63 FTE), which is in line with the expiration of the research projects within the BUW.

Average number of FTE

Reporting period	Management	Primary process (science)	Support	Total average	Average 2020	Difference
DUBBLE		1.79	0.00	1.79	2.00	-0.21
NWO The Hague (international payroll)		0.00	1.00	1.00	0.00	1.00
NWO-I (BUW)		114.15	2.00	116.15	179.06	-62.91
NWO-I (DIFFER)	2.00	54.27	61.95	118.23	123.54	-5.31
NWO-I (AMOLF)	2.00	86.11	76.34	164.45	169.69	-5.25
NWO-I (ARCNL)	2.00	37.59	9.20	48.79	46.00	2.79
NWO-I (ASTRON)	2.00	52.67	126.52	181.19	175.44	5.75
NWO-I (Office)	1.00	0.00	39.66	40.66	41.38	-0.72
NWO-I (CWI)	2.00	168.18	39.53	209.71	207.38	2.33
NWO-I (JIVE)	0.00	11.84	10.41	22.25	22.38	-0.13
NWO-I (NIKHEF)	2.00	106.79	104.85	213.64	234.06	-20.42
NWO-I (NIOZ)	2.00	176.27	139.94	318.21	292.83	25.38
NWO-I (NSCR)	2.00	47.10	7.59	56.69	42.36	14.32
NWO-I (SRON)	2.00	94.57	95.49	192.06	201.37	-9.31
End total reporting period	19.00	951.33	714.47	1,684.80		
End total previous year	20.00	1,008.15	709.33	1,737.48	1,737.47	-52.67
Movement	-1	-56.82	5.14	-52.68		

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 €201,000.00 (General Maximum Remuneration) in 2020. 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).

Senior executives with an employment contract and senior executives without an employment contract from the 13th month of job performance.

See following pages

PART 1/2 - Senior executives with an employment contract and senior executives without an employment contract from the 13th month of job performance.

amounts x €1	M. Luizink	J.E. van der Boon	C.C.J.H. Bijleveld	S.C.M. Bentvelsen	J.W.M. Frenken	C.A. Jackson	M.W. Wise
Job details	NWO-I director	Director of operations	Senior researcher 1 <1>	Director Nikhef <3>	Director ARCNL <3>	Director ASTRON <3>	Director SRON <3>
Start and end of job performance in 2021	01/01 - 06/21	06/03 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Part-time factor in FTE	1	1	0.68	1	1	1	1
(Notional) employment relationship?	yes	yes	yes	yes	yes	yes	yes
Remuneration							
Remuneration plus taxable expense allowances	€ 65,021.36	€ 71,112.98	€ 96,513.27	€ 169,369.91	€ 155,498.55	€ 187,386.43	€ 144,989.28
Remuneration payable over time	€ 10,408.09	€ 12,660.13	€ 19,836.36	€ 23,305.80	€ 23,109.96	€ 23,523.72	€ 22,473.24
Remuneration	€ 75,429.45	€ 83,773.11	€ 116,349.63	€ 192,675.71	€ 178,608.51	€ 210,910.15	€ 167,462.52
Individually applicable remuneration maximum	€ 98,487.67	€ 121,391.78	€ 142,120.00	€ 209,000.00	€ 209,000.00	€ 209,000.00	€ 209,000.00
-/- Undue amount paid							
Total remuneration	€ 75,429.45	€ 83,773.11	€ 116,349.63	€ 192,675.71	€ 178,608.51	€ 210,910.15	€ 167,462.52
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	The excess of €1,910.15 was caused by vacation hours paid out and attributable to 2020.	N/A
2020 data							
Start and end of job performance in 2020	10/01 - 12/31	9/1 - 9/30	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31	01/01 - 12/31
Part-time factor 2020 in FTE	1	1	should be there is an optical excess related to payment of the 2020 vacation allowance which, for the WNT test, can be allocated to 2020 and then to previous years). After allocation, the individual remuneration maximum for 2021 and earlier years is not exceeded.	1	1	1	1
(Notional) employment relationship	yes	yes	yes	yes	yes	yes	yes
Remuneration plus payable expense allowances	€ 30,344.31	€ 10,114.77	€ 122,707.81	€ 166,952.92	€ 160,790.19	€ 123,519.65	€ 138,381.12
Remuneration payable over time	€ 5,121.84	€ 1,707.28	€ 19,297.44	€ 21,447.36	€ 21,164.40	€ 20,336.52	€ 20,631.96
Subtotal	€ 35,466.15	€ 11,822.05	€ 142,005.25	€ 188,400.28	€ 181,954.59	€ 143,856.17	€ 159,013.08
Individually applicable remuneration maximum	€ 50,524.59	€ 16,475.41	€ 190,427.40	€ 201,000.00	€ 201,000.00	€ 201,000.00	€ 201,000.00
Total remuneration 2020	€ 35,466.15	€ 11,822.05	€ 142,005.25	€ 188,400.28	€ 181,954.59	€ 143,856.17	€ 159,013.08

<1> Officer is designated as a senior executive until no later than September 1, 2023 in connection with previous position as Director NSCR.

<2> Disclosure related to payment of vacation allowance for period July through September 2020 period of senior executive in that year.

<3> Officer is designated as senior executive until no later than October 1, 2024 in connection with change in governance as of October 1, 2020

PART 2/2 - Senior executives with an employment contract and senior executives without an employment contract from the 13th month of job performance.

amounts x €1	P.H. van der Laan interim director NSCR <3>	H.J. Bakker Director Amolf <2>	M.C.M. van de Sanden Director DIFFER until July 1, 2020 <2>	M.R. de Baar Director DIFFER from July 1, 2020 <2>	H. Brinkhuis Director NIOZ <2>
Job details					
Start and end of job performance in 2021	1/1 - 10/31				
Part-time factor in FTE	1	1	0.6	1	1
(Notional) employment relationship?	yes	yes	yes	yes	yes
Remuneration					
Remuneration plus taxable expense allowances	€ 108,094.91	€ 3,283.52	€ 902.97	€ 2,240.88	€ 3,611.88
Remuneration payable over time	€ 6,043.46	€ 0.00	€ 0.00	€ 0.00	€ 0.00
Remuneration	€ 114,138.37	€ 3,283.52	€ 902.97	€ 2,240.88	€ 3,611.88
Individually applicable remuneration maximum	€ 174,071.23	€ 0.00	€ 0.00	€ 0.00	€ 0.00
-/- Undue amount paid					
Total remuneration	€ 114,138.37	€ 3,283.52	€ 902.97	€ 2,240.88	€ 3,611.88
The amount of the excess and the reason why the excess is or is not allowed	N/A	There is an optical excess of €3,283.52 related to payment of the 2020 vacation allowance which, for the WNT test, can be allocated to 2020 and then to previous years. After allocation, the individual remuneration maximum for 2021 and earlier years is not exceeded.	There is an optical excess of €902.27 related to payment of the 2020 vacation allowance which, for the WNT test, can be allocated to 2020 and then to previous years. After allocation, the individual remuneration maximum for 2021 and earlier years is not exceeded.	There is an optical excess of €2,240.88 related to payment of the 2020 vacation allowance which, for the WNT test, can be allocated to 2020 and then to previous years. After allocation, the individual remuneration maximum for 2021 and earlier years is not exceeded.	There is an optical excess of €3,611.88 related to payment of the 2020 vacation allowance which, for the WNT test, can be allocated to 2020 and then to previous years. After allocation, the individual remuneration maximum for 2021 and earlier years is not exceeded.
2020 data					
Start and end of job performance in 2020	10/1 - 10/31	01/01 - 9/30	01/01 - 6/30	7/01 - 9/30	01/01 - 9/30
Part-time factor 2020 in FTE	1	1	1	1	1
(Notional) employment relationship	yes	yes	yes	yes	yes
Remuneration plus payable expense allowance	€ 128,236.08	€ 112,481.82	€ 93,589.00	€ 30,268.31	€ 136,637.36
Remuneration payable over time	€ 20,360.16	€ 15,570.63	€ 10,723.68	€ 5,099.31	€ 16,154.10
Subtotal	€ 148,596.24	€ 128,052.45	€ 104,312.68	€ 35,367.62	€ 152,791.46
Individually applicable remuneration maximum	€ 201,000.00	€ 150,475.41	€ 99,950.82	€ 50,524.59	€ 150,475.41
Total remuneration 2020	€ 148,596.24	€ 128,052.45	€ 104,312.68	€ 35,367.62	€ 152,791.46

<1> Officer is designated as a senior executive until no later than September 1, 2023 in connection with previous position as Director NSCR.

<2> Disclosure related to payment of vacation allowance for period July through September 2020 period of senior executive in that year.

<3> 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 of senior executive	Position	
C.C.A.M. Gielen	President	until April 1, 2021
M.M. Levi	President	from April 1, 2021
C.E. Visser	Vice president	
J. de Boer	Board member	
J.J.G. Geurts	Board member	
A.P. Hardon	Board member	
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 €1,700 or less

Name	Position	
C.C.A.M. Gielen	President Foundation Board	until April 1, 2021
M.M. Levi	President Foundation Board	from April 1, 2021
C.E. Visser	Vice president Foundation Board	
J. de Boer	Board member	
J.J.G. Geurts	Board member	
A.P. Hardon	Board member	
M.P.C. Weijnen	Board member	

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

Table 2 Benefit due to termination of employment

Amounts x €1	M. Luizink
Job details	NWO-I director
Employment in FTE	1
Year in which employment ended	2021
Benefit due to termination of employment	
Agreed benefits due to termination of employment	€ 22,905.45
Individually applicable maximum	€ 75,000.00
Total benefits due to termination of employment	€ 22,905.45
Of which paid in 2021	€ 22,905.45
Amount unduly paid and not yet recovered	N/A

Depreciation/amortization

	2021	2020
	x €1,000	x €1,000
Depreciation/amortization		
Amortization on intangible fixed assets	296	22
Depreciation on tangible fixed assets	6,586	5,642
Depreciation charges passed on	-53	-240
Depreciation/amortization	6,829	5,424
<i>Breakdown</i>		
Depreciation on tangible fixed assets	12,562	11,377
Movements in investment grants (-/-)	-6,031	-5,735
Total depreciation on tangible fixed assets	6,531	5,642

The depreciation of tangible fixed assets (€12,562k) is €1,185k more than in 2020, mainly due to higher depreciation charges:

- Buildings (€1,225k), especially new construction SRON, €1,170k
- Inventory (€182k), of which at SRON €124k
- And lower depreciation charges on Equipment (-€30k) and Computer Equipment (-€147k)

Investment grants (being a contribution from NWO for New Construction) have been deducted from depreciation of tangible fixed assets. (€6,031k)

Housing expenses

	2021	2020
	x €1,000	x €1,000
Housing expenses		
Rent expenses	1,470	869
Insurance expenses	309	403
Maintenance expenses (minor maintenance)	1,719	2,277
Energy and water	4,021	3,101
Cleaning costs	1,148	958
Housing taxes and levies	1,586	640
Other housing expenses	5,095	536
Housing expenses	15,348	8,784

Housing expenses (€15,348k) increased with respect to 2020, by €6,564k, mainly due to:

- €558k increase Maintenance expenses (minor maintenance), of which NIOZ €410k
- €920k increase Energy and Water, of which SRON €470k
- €946k increase Taxes and levies, of which SRON €590k
- €4,595k increase Other housing expenses, of which SRON €4,156k, which is related to the Relocation to Leiden.

Other expenses

	2021	2020
	x €1,000	x €1,000
Other expenses		
Administration and management expenses	30,402	11,240
Inventory and equipment	5,043	5,339
Allocation to other provisions	207	-51
Other	20,864	32,059
Other expenses	56,516	48,587
Administration and management expenses		
ICT costs	1,913	1,432
Outsourced work	4,858	3,166
Auditor's costs	738	646
Interest expenses associated with interest subsidies	-	-
Other administration and management expenses	22,893	5,996
Administration and management expenses	30,402	11,240
Breakdown Auditor's costs		
Cost of audit of financial statements	583	497
Other audit engagements	133	129
Advice on tax matters	-	20
Other non-audit services	22	-
Auditor's costs	738	646
Other		
Research-related costs	18,762	28,890
Travel and subsistence expenses	1,173	1,454
Other expenses	929	1,715
Other costs	20,864	32,059

The Other expenses amounted to €56,516k, which is €7,929k more than 2020.

- Administration and management expenses (€30,402k) increased by €19,162k, of which
 - o Outsourced work, €5,047k, mainly at Nikhef (€604k, of which new project E-test and LHC Roadmap fully running) and NIOZ (€4,160k, mainly due to costs related to the fleet replacement)
 - o Other management expenses, €17,513k more, mainly at ASTRON €14,629k, being the SKA contribution.
- Inventory and equipment (€5,043k) decreased by €296k.
- The item Other (€20,864k) decreased by €11,195k, of which
 - o Research-related costs (€18,848k) a decrease of €10,128k, especially at ASTRON (€1,859k), Nikhef (€936k), NIOZ (€4,143k) and SRON (€2,748k) due to lower project activities than in the year 2020.
 - o Other expenses (€929k) a decrease of €786k.
 - o Travel and subsistence expenses (€1,173k), a decrease of €281k on balance, however at both NIOZ (€267k) and SRON (€94k) an increase in travel expenses.
- For the auditor's costs, the costs of auditing the financial statements for the 2021 audit were fully accounted for to the extent known. The expenses included under this item for 2021 relate to the current auditor Ernst & Young Accountants LLP.
The item other audit engagements of €119k relates to the audit of projects by Ernst & Young Accountants LLP.

2021 amounts x €1,000	Ernst & Young Accountants LLP	Other network	TOTAL network
Audit of the financial statements	553	5	558
Other audit engagements	137	-5	132
Tax consultancy	1	-	1
Other non-audit services	13	9	22
Total	704	9	713

2020 amounts x €1,000	Ernst & Young Accountants LLP	Other network	TOTAL network
Audit of the financial statements	493	4	497
Other audit engagements	119	10	129
Tax consultancy	-	20	20
Other non-audit services	-	-	-
Total	612	34	646

The other network items involve a separate audit report for the Governing board of ARC NL and audit engagements at SRON.

Notes on expenses compared to the Budget

	2021 x €1,000	2021 Budgeted x €1,000	2020 x €1,000
Expenses			
Personnel expenses	138,908	136,064	137,070
Depreciation/amortization	6,829	8,999	5,424
Housing expenses	15,348	21,802	8,784
Other expenses	56,516	51,788	48,587
Total expenses	217,601	218,653	199,865
Balance of income and expenditure	-2,541	-19,090	8,633

The total expenses amounted to €217,601k and were €1,052k less than the budget

- Personnel expenses, €2,844k higher, of which
 - Lower Direct personnel expenses (€942k) and €4,066k higher Other personnel costs, of which at ASTRON €1,448k and NIOZ €1,033k.
- Depreciation expenses, €2,225k lower,
 - o mainly due to the renovation at Nikhef which started later
- Housing expenses €6,454k lower,
 - o 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, €4,728k higher,
 - o mainly as the result of an early payment to the SKA organization €10,206k. An additional contribution was also received for these higher expenses, thus largely covering the result in the reporting year.

	12-31-2021	12-31-2020
	x €1,000	x €1,000
Financial income		
Interest receivable and similar income	73	24
Financial income	73	24
Financial expenses		
Interest payable and similar expenses	63	39
Financial expenses	63	39
Financial income and expenditure	10	-15
Taxes	-	-
Taxes (- / -)	-	-
Result from participating interests	-254	-13
Third party share in result	-	-
Third party share in result	-	-

NET RESULT

The result for the 2021 financial year amounts to negative €2,785k 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.

	2021	2021 Budgeted	2020
	x €1,000	x €1,000	x €1,000
Distribution of result			
- Movement in general reserve	-62	-	-842
- Movement in legal reserve	-	-	-
- Movement in earmarked reserves (public)	-3,771	-18,487	7,540
- Movement in earmarked Funds	-693	-628	-347
- Movement in other legal reserves	1,738	-	2,254
- Movement in other components	-	-	-
Total distribution of result	-2,785	-19,115	8,605

9 Notes to cash flow statement

The cash flow statement of NWO-I shows what caused the decrease in liquidity of €46,116k.

The cash flow from operating activities resulted on balance in a decrease of €17,232k, mainly due to depreciation (€12,913k), a decrease in Receivables (€24,322k) and a decrease in Current liabilities (€2,282k).

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 results in a decrease in liquid assets of €28,884k, mainly due to investments (-€30,296k) and disinvestments (€56k) in tangible fixed assets, investment in intangible fixed assets (-€2,020k) and Investment grant received in advance for the New SRON Building (€3,500k).

10 Events after the balance sheet date

There were no events after the balance sheet date with significant financial impact on the 2021 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 14 June 2022.

Independent auditor's report

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

Report on the financial statements 2021 included in the annual report

Our opinion

We have audited the financial statements 2021 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 2021, and of its result for the year 2021 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 2021;
- The statement of income and expense for the year 2021;
- 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 2021 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 2021" (WNT Auditing Protocol 2021), 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 that consists of :

- Board Report
- Other data
- List of abbreviations

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 education institution'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 2021 (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;

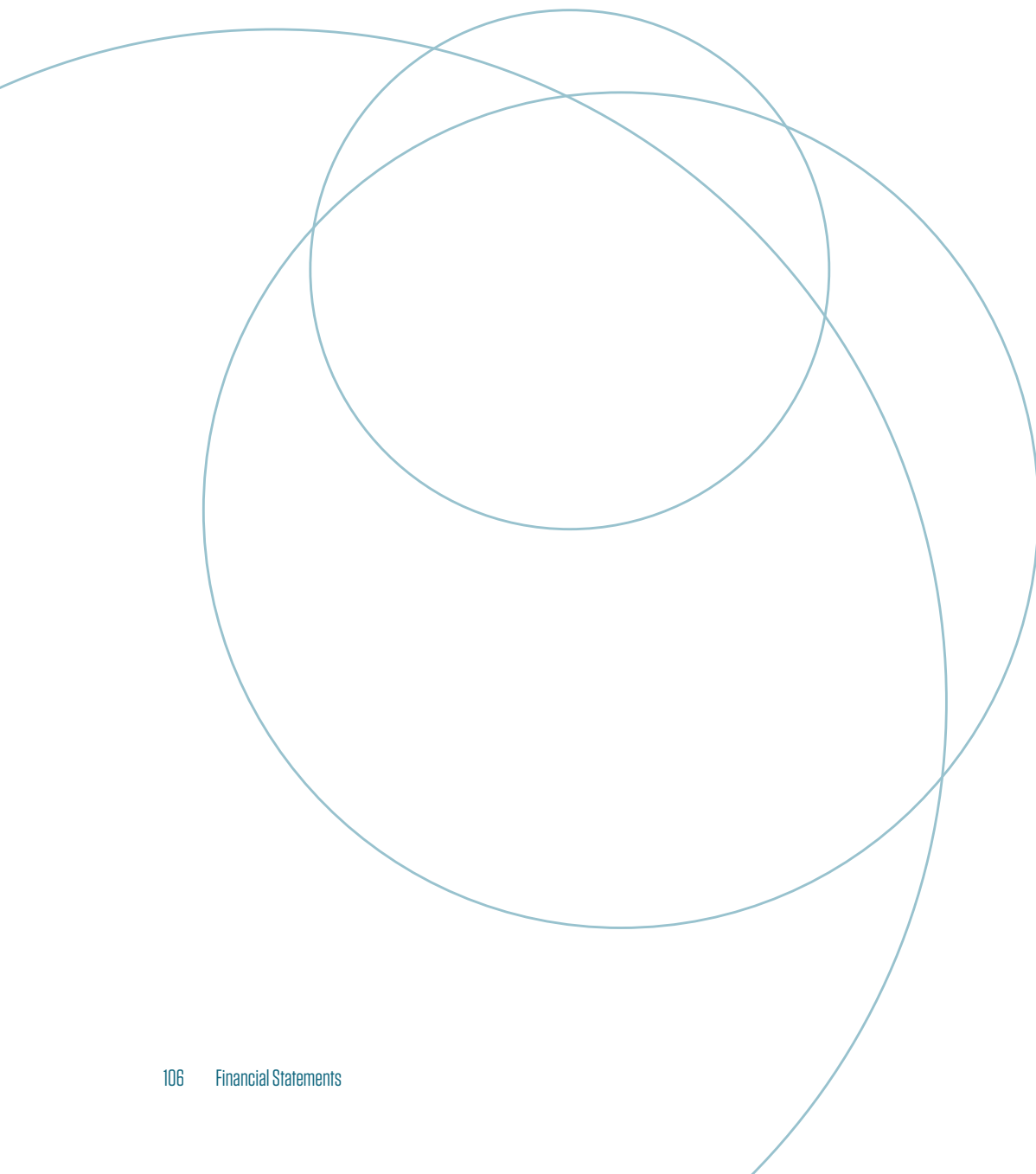
- Obtaining an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the internal control of the education institution's internal control;
- Evaluating 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, 14 June 2022

Ernst & Young Accountants LLP

M.A. Brandhorst MSc RA



List of abbreviations

ABP	Algemeen Burgerlijk Pensioenfonds [General Pension Fund for Public Employees]
AMOLF	Physics of functional complex matter (institute)
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	Center 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.



Masthead

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