



Recognising and Rewarding Talent in Today's Academia

NWO-I in a Changing Academia



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Statement of Intent

Recognising and Rewarding Talent in Today's Academia - NWO-I in a Changing Academia



An academic career can be incredibly rewarding: offering opportunities to advance human knowledge, educate the next generations and tackle some of society's greatest challenges. However, it is also a demanding career path. Successful academics today are asked to take on a wide range of activities beyond just research or education, including management, fund-raising and outreach to name but a few. This wider range of activities is especially true for staff at NWO-I, where research is only one aspect of fulfilling the national roles that NWO institutes provide in the community. At the same time, academia itself is changing with large national and international collaborations becoming increasingly common and topics like team science, open science, scientific integrity, diversity and sustainability demanding more attention. Balancing these diverse responsibilities while operating in a landscape where individual contributions can be harder to identify means that choosing a suitable career path and navigating a successful career in academia have become more challenging than ever.

While the conditions for academic success may have changed, the ways in which that success is measured have largely remained the same. Traditional simple metrics, such as the publication rate and grant approvals, no longer reflect the full picture of success in modern academia. There is a growing consensus that the manner in which we recognise and reward academic achievement for individuals and groups must evolve to include the full diversity in academic career paths and reflect the unique talents and ambitions this diversity brings. This consensus has given rise to various efforts around the world, such as the San Francisco Declaration on Research Assessment (DORA) principles in the US, and here in the Netherlands, the "Room for everyone's talent" initiative by VSNU, NFWO, KNAW, NWO, and ZonMw. These initiatives, and efforts like them, seek to modernise our definitions for academic success and the methods we use to evaluate it so that these are better aligned with the complex academic and societal issues of this age.

At NWO-I, we fully support these initiatives and consider the current national effort to develop a better recognition and rewards system as an important step toward that ideal of a more inclusive, balanced and high-quality academic community. Ultimately, we envisage a change of culture in the entire global academic community. However, such a lofty ambition cannot be achieved in isolation but only in close and continuous consultation

with our national and international partners. And, of course, changing a culture takes time and perseverance. NWO-I is committed to contributing to and leading this change.

NWO institutes

The NWO institutes are a unique feature of the Dutch research landscape and have a national role on behalf of their respective scientific communities. To serve this national role, NWO institutes require an inclusive system of recognition and reward that serves their own personnel while taking the interplay between personnel, institutes and the scientific communities into account. NWO institutes need to maintain a strong connection to the scientific communities they serve to fulfil their missions. The most straightforward way to achieve this is to be an active part of those communities. All of the NWO institutes host world-leading research staff and, just like their counterparts at the universities, our researchers perform fundamental research, publish their results and engage in collaborations with fellow researchers in the Netherlands and internationally. They also contribute to the educational mission of the universities through teaching and student supervision. By the same token, they are equally vulnerable to a recognition and reward system that does not properly acknowledge the full span of their contributions.

However, this traditional researcher profile alone does not describe the full breadth of NWO-I staff.

The expertise necessary to support the national roles of the institutes is reflected in a more diverse range of staff profiles. NWO institutes also support the Dutch academic community by developing and maintaining unique capabilities and expertise to facilitate their research and collaborations. These capabilities range from crucial experimental facilities and research infrastructures to technical expertise, computing resources and software skills. NWO institutes also provide scientific advice to citizens, companies and the government, whenever and wherever it is requested or necessary. Many NWO institutes also represent the Dutch scientific community in various international collaborations and consortia.

NWO institutes require staff with a wide range of skills and, therefore, a broad range of career paths to fulfil these national roles. In addition to the familiar researcher, who might have many of the same responsibilities as a researcher at the universities, the staff of NWO institutes includes instrument specialists, technical experts, mechanical engineers, software engineers, data privacy officers, data managers, project managers, scientific communication experts, specialised support staff, and more. All of these skills are required to support the missions of the institutes on behalf of the Dutch scientific community. At the individual level, we envision a cultural change where NWO-I employees have more freedom to create their own career paths. Developing a system of recognition and rewards that accurately acknowledges this diversity in academic careers is clearly of particular importance for NWO-I.

Scientific and societal impact

As a nationally-funded organisation, NWO-I has a responsibility to share the results of its work with the scientific community and society, a responsibility we share with the universities and KNAW institutes. The NWO institutes also share a core mission to advance the state of the art in their respective domains and to position the Dutch scientific community at the forefront of research worldwide. The ultimate success in pursuing these institutional missions is determined by the impact we have on our communities, our fields and society.

Across the whole of NWO-I, these impacts can take a variety of forms, many of which are parallel to those at the universities. For example, in the case of research impact, we actively share our research through publications, national and international collaborations, and participation at workshops and conferences, just as university researchers do. Along with these shared activities, however, NWO institutes also play a supporting role for their research communities by providing access to facilities and expertise. This support can take many forms, such as assistance in utilising experimental facilities or research infrastructure, developing data products, tools or software for use by the community, or providing technical expertise and consultation. In all these cases, the impact of the institutes is measured not in the direct research output of its own staff, although NWO-I staff may, of course, also be involved, but rather by the research it enables for the community.

Similarly, the development of human capital through education, training and outreach activities is one of the most crucial forms of impact for both universities and NWO institutes alike. Training the next generations of scientifically literate citizens, whether they pursue academic or private sector careers, is a core responsibility for the university community and NWO institutes support these activities by contributing to all aspects of education. In addition to formal academic education in collaboration with universities, the engineering and technical staff at NWO institutes provide training through technical internships either directly or in partnerships with industry. Together, these activities comprise one of the most valued forms of impact for NWO-I.

Finally, transfer of knowledge to companies, NGOs, governments, or citizens, valorisation activities and supporting geographical return to Dutch industry is an important form of impact for NWO institutes. In most instances, this impact is directly related to the national or international research infrastructures that many of the NWO institutes support as part of their national roles. Although university research groups contribute to many of these activities too, they are arguably given more attention within NWO-I and certainly represent an important metric of societal impact for the institutes. Although far from a definitive list, these examples already show that the forms of impact NWO institutes

have on their communities and society embrace a wide range of activities beyond pure research alone. These impacts are often at odds with the research activities performed, as they require significant staff time and resources to realise. Moreover, they also involve a larger fraction of the staff at NWO institutes as well, since virtually all staff may contribute to these institutional impacts in various ways and not just those employees who follow traditional research trajectories. In view of this, it is vital to establish a recognition and rewards system that encompasses the full range of ways in which all NWO-I staff support the impacts necessary to fulfil their institutional missions.

Modern academic leadership

The concept of modern academic leadership lies at the very heart of the change in culture we hope to achieve. What it means to be a leader in academia is inextricably linked with what we choose to recognise and reward. These are the criteria that will be used to choose academic leaders, and these criteria embody the values which future academic leadership will need to nurture. A more modern view of what these criteria should be is particularly relevant at NWO-I, where leadership may not be focused solely on research innovations but also include technical, team and individual development or support activities.

In reconsidering what we mean by academic leadership, the concepts of team science (i.e. the science produced as a team) and diversity are particularly relevant for academic staff today, and especially for staff at the NWO institutes. In the case of team science, there is a recognition that academic leaders should focus not only on personal achievement, but stimulate group achievements as well. The overall performance of a team or group, the development of group members' capabilities and experience, and the creation of an open and supportive work environment should be seen as core tenets of modern academic leadership and developed and rewarded accordingly. More generally, participation in collaborations and teams should be recognised and valued. If researchers know they will be credited for their team's achievements, it gives them the confidence to develop their skills and knowledge based on their ambitions and strengths instead of merely checking the boxes for standard metrics to succeed. Such an

environment is advantageous for individuals, teams, institutes and science.

This broader picture of leadership is highly applicable at NWO institutes where, alongside traditional research groups, staff may also lead teams focused on development or support activities. The goals for these teams may differ dramatically from traditional research outcomes, but the broader expectations for the leadership of those teams remains the same.

Encouraging diversity is another core value for modern academic leaders. In modern collaborations, this diversity can take the form of differing skill sets, experience or career trajectories but could also include multidisciplinary teams or mixed teams incorporating researchers, technical and support staff. Team diversity may also encompass differences in cultural backgrounds, gender, sexual orientation, neurodiversity or disability. Diverse groups provide room for different competencies and tasks and provide a climate in which inclusive thinking is the norm. A broad range of expertise, knowledge and backgrounds creates an inspiring environment that can more rapidly lead to new ideas. At NWO-I, we wish to create an environment for scientific research with room for diversity in career paths and personal dimensions made possible thanks to good leadership in which vision and the support for teamwork go hand in hand.

Path to change

The initiative to align the recognition and rewards system in academia with the realities of a modern academic career is a truly international undertaking. Here in the Netherlands, it brings together virtually all stakeholders from universities to knowledge institutes. At NWO-I, we are committed to contributing to this initiative both inside and outside of the organisation. In this overview, we have outlined several aspects of a more modern recognition and rewards system that are particularly important for the NWO institutes. The following chapters will address each of these topics in greater detail. In each chapter, we briefly discuss components of the recognition and rewards system that are shared with our university partners and focus on the aspects of these components that are unique to NWO-I.

We attempt to identify areas where change is necessary and possible actions to achieve these changes. This document will form the basis of further discussion with NWO-I staff as well as other academic partners. These consultations will be used to define concrete recommendations for policy changes that can be implemented within the NWO institutes to improve the recognition and rewards system for not just our researchers, but for all staff.

Changing a culture takes time, communication and, ultimately, commitment. In this vision statement, the NWO-I committee on recognition and rewards (for a full list of the committee members see Addendum 1) presents the ambition and strategy to achieve this change locally, but also in cooperation with other members of the academic community. NWO-I is dedicated to making our institutes places where all our staff can excel across a broad range of academic careers and with credit and recognition for the full range of their achievements.

RECOGNIZING AND REWARDING TALENT IN TODAY'S ACADEMIA

NWO-I IN A CHANGING ACADEMIA



NATIONAL ROLE



LEADERSHIP



TOWARDS A MORE INCLUSIVE,
BALANCED AND HIGH QUALITY
ACADEMIC COMMUNITY.



IMPACT



EDUCATION



RESEARCH



NWO-I IS DEDICATED TO HELPING OUR STAFF EXCEL IN ALL THEIR ACTIVITIES FOR SCIENCE AND SOCIETY.

NIOZ AMOLF ARCNL DIFFER CWI NIKHEF SRON NSCR ASTRON

National role

NWO-I currently has nine institutes: AMOLF, ARCNL, ASTRON, CWI, DIFFER, Nikhef, NIOZ, NSCR and SRON. These institutes represent a portfolio of research areas covering, among others, physics, astronomy, mathematics, informatics, maritime, and crime and law enforcement.

The role of these institutes is to support, unify and federate the activities in the Netherlands in a specific field of research as well as conducting top-level research. By doing this, these institutes not only support science at large. They also strengthen the position of the Netherlands in the international research landscape and connect to other research institutions, groups or activities. Therefore, an institute must have a clear focus, sufficient mass and foreseeable continuity. The institutes constitute centres of excellence where the necessary knowledge, know-how and skills for carrying out research are maintained and further developed. They provide a home to excellent researchers and engineers with a wide variety of backgrounds and experiences. A stable and responsive environment for research is provided through the mission budgets of the institutes and research grants of individuals or groups, respectively. Some institutes can have additional roles such as providing access to (inter)national infrastructures, instruments, fleets, or facilities, or sharing heritage, collections, data, software and technologies. The national role can also involve other tasks related to, for example, science diplomacy (e.g. formation of, participation in, and leading of (inter)national consortia), a user community (e.g. computing for the analysis and storage of data) and engineering (e.g. conception, design, construction and operation of large infrastructures or facilities). The institutes also make the importance of research visible to society and liaise with (Dutch) industry.

Several tasks are linked to the other areas which are addressed in the chapters Education, Impact, and Leadership. The national role can be seen as a nexus between the scientific community, industry, NWO-I and society at large.



Vision

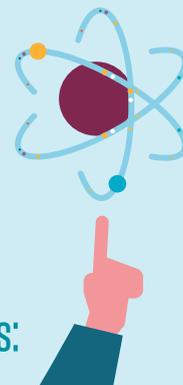
The NWO institutes aim to offer an inspiring and diverse working environment with skilled researchers, interdisciplinary collaborations, modern equipment and access to large (international) infrastructures and facilities. The work of a researcher at a national institute is motivated by science. It can range from a flash of genius to a multiannual project and from a single person to a collaboration with thousands of persons from many different countries.

As NWO institutes, we have a national role to strengthen research fields and the Dutch scientific community in general. This also encompasses working with an open-access mindset. The institutes should adhere to the FAIR (Findable, Accessible, Interoperable, Reusable) and DORA (Declaration on Research Assessment) principles, and open science and open access guidelines.

Many of the tasks that we view as part of the national role require a diverse staff with different areas of expertise and experience. Without our research and technical staff, we would not be able to fulfil our national role, and the Dutch research community would be adversely affected. Therefore, the work all staff do to execute our national role should be recognised and rewarded as such.

Currently, recognition of the national role is done indirectly by appraising successful collaborations and research output of the infrastructures and facilities. In our current performance appraisal, there is an emphasis on individual productivity. We want the activities that contribute to science at large and the national role therein to weigh more heavily. The goal for the future is to increase awareness of our national role among our researchers, specify tasks linked to the national role,





Actions

We propose the following actions:

Each institute identifies and communicates its national role and corresponding tasks.

The national role should be taken into account in evaluations of individuals, teams and institutes, e.g. performance and development meetings and the Standard Evaluation Protocol (SEP).

Reserve the resources needed for the national role.

Support on granting proposals that contribute to the national role but are difficult to define in research results.

Monitor the progress on FAIR and DORA principles, and the guidelines for open science and open access.

Each institute should work on a Gender Equality Plan (GEP) and include bias training.

Stimulate mobility by providing meeting points for sharing knowledge and interaction between institutes.

Make a plan to facilitate and encourage the exchange of people (periodically, temporarily and permanently) between institutes and beyond.

make efforts of all staff in these tasks more visible, and recognise and reward them accordingly.

Mobility on a wide scale must be stimulated as this endorses the exchange of knowledge and provides easy access to new career paths. Sharing knowledge and personal interaction between staff from institutes needs to be strongly encouraged.

In view of their national role, the institutes should act as role models for a diverse and inclusive working environment, which is endorsed by NWO-I.

Changes needed

In order to achieve this, NWO-I should:

- Recognise the national role of the institutes and the corresponding efforts of all staff;
- Support the tasks related to the national role;
- Adhere to the FAIR and DORA principles, open science and open access;
- If applicable, include computing, software, cyber security and data management in the national role and reward these accordingly;
- Encourage a diverse and inclusive working environment;
- Raise awareness on (gender) bias;
- Allow internal and external mobility.

Leadership

Science is the result of human effort, and is increasingly realised in teams. Small groups of people work together within NWO-I institutes but also larger collaborations between NWO-I institutes and universities exist, which are often the result of joint project funds. In some cases, international collaborations are formed and continue for a number of years, involving many different funding authorities. As science is a continuous process, the NWO-I institutes constitute a common place to maintain and develop the required knowledge, know-how and skills to sustain research.



Vision

Leadership is the action of leading a group of people or organisations to achieve objectives and develop a long-term vision or strategy. In the NWO-I context, this might be leading a research group, leading a support department, leading an institute, leading a consortium, or the supervision of individual students. In the context of science, it is the skill to lead a team towards combined success. This involves more than the transfer of knowledge and skills; effective leadership is also adapting a flexible leadership style towards the individual needs of the team members.

Changing a culture requires leaders to lead by example, as they represent standards in the organisation and in their team. Effective leadership in a changing environment requires self-awareness and personal development, as only then can a leader put themselves in an independent position to understand and be understood by their team.

Through effective leadership, the effectiveness and development of co-workers are stimulated. At a more personal level, this implies promoting equity, diversity, inclusion and the vitality of team members, including a healthy work-life balance. Furthermore, effective leaders are socially connected, supporting researchers in more areas than just research. Employees coping with stress (either work or non-work related) need support and a safe relationship with their team leader, so this can be addressed with and without help from HR advisors.

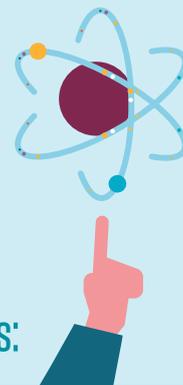
Open science, diversity and team science

Open science, according to NWO, is the movement that aims at more open and collaborative research practices in which publications, data, software, and other types of academic output are shared at the earliest possible stage and made available for reuse. Leaders play a key role in implementing open science practices within and outside the institutes. The investments that are needed to implement open science practices will bring the quality and reproducibility of the research process to a higher level, open up new career paths and provide opportunities for cross-disciplinary research.

Research is becoming increasingly multidisciplinary, involving teams of people with variable backgrounds (e.g. grants for international and interdisciplinary consortia). This is a good thing because it connects expertise and knowledge from different fields, which leads to new insights and more knowledge flow (ref. [Science benefits from diversity](#) and [Delivering through Diversity](#)). Leaders have a responsibility to maintain an open and safe environment where there is room for social diversity but also for diversity in knowledge and skills.

Team science requires leaders that set the standards in an organisation and in their team. The more complex a group, the more important the role of leadership. In addition to the progress of science, various aspects of leadership cover human relations, such as internal and external communication or project, budget and crisis management. Of course, in an international context, each researcher can play a leading role in their field of





expertise. Team science may cross national borders and involve foreign resources, facilities and sites as well as different cultures, time zones and legal systems.

Actions

We propose the following actions:

Changes needed

In order to achieve this, NWO-I should:

- Give leaders the time for topics such as scientific integrity and the development, effectiveness, well-being and equity of the team members. These aspects should play a role in the evaluation of leadership within organisations;
- Place more emphasis on these aspects during the recruitment process and the assessment of leaders at NWO-I. During performance reviews, input from their group members should be included in the procedure;
- Provide training and intervision of leadership at the beginning and continue throughout leadership careers, because leadership is a skill that can be developed. All interested employees should have the opportunity to develop those leadership skills, even if their employment is temporary.

The performance of all team members should be part of the annual evaluation of leaders. Feedback from team members and former team members should be incorporated in the evaluation, appointment and selection of leaders. Therefore, it is important that leaders create an open and safe atmosphere in which team members feel free to provide feedback.

Leadership courses that communicate modern insights into leadership (i.e. situational leadership) should be offered and incorporated into the evaluation of leaders.

Leaders should be aware of the importance of the personal and career development of their team members. Institutes should therefore facilitate programmes that enable exploration of career development with a coach. Leaders should encourage and support their employees to participate in these programmes.

The way leaders assess their team members should give more room to everyone's talent. Initiatives to work on subjects supporting the mission of the institute, open science, impact, education and leadership should be mentioned and rewarded in evaluations.

Vacancy texts should include a target profile (besides the hard requirements). Leaders should customise this profile case by case to optimise diversity within the team.

Research

Research concerns all activities of investigation, experimentation, exploration, theory, method development, discussion and collaboration that lead to new insights. This also includes scientific support tasks that lead to (scientific) innovations, such as the creation of software and instrumentation, scientific engineering and operations. However, the theme ‘research’ is broader than research performed in institutes. It also involves hiring new researchers, reviewing papers and proposals, training and guiding early-career researchers and sharing knowledge through collaborations and open science practices (e.g. publication of data and software). It is important that researchers can contribute to and are recognised for this full suite of research activities.



Research positions and funding for research are limited, which inevitably creates competition between researchers. The outcome in this competition is determined during evaluations of researchers and their research output (publications, software, data sets, etc.) during job applications, when ranking grant applications and for deciding on promotions. It is challenging to rate the quality of researchers and their research, which has resulted in the fact that evaluations of research are often based on measures such as acquired funding, numbers of papers and citations. High-quality research and related activities that do not directly or visibly translate into these metrics are often insufficiently recognised and remain undervalued, partly because it is difficult to know upfront which research will have an impact and at which timescale this impact will be seen. Positive impact should therefore be more accurately identified - so it can be properly evaluated and stimulated.

Vision

The quality of research or a researcher should be evaluated within the broad term ‘knowledge creation’. Research should be reproducible and transparent with open science practices adopted. The scientific integrity of a researcher is crucial. An NWO-I policy document on this topic is available and efforts are being made to increase the awareness of these procedures. According to the European Code of Conduct for Research Integrity, researchers should be reliable, honest, respectful and accountable. Furthermore, research should be evaluated based on quality even before the impact of this research is seen, because the impact is not always immediately clear (e.g. research with a ‘negative’ result and applied research that cannot easily be generalised). At the same time, a balance needs to be found between concrete evidence and personal narrative and attributes.

In order to achieve this, NWO-I should:

- Focus on creating a good environment where internationally recognised scientific practices, e.g. DORA, are the norm and where everyone feels that they and their colleagues are accountable;
- Recognise and reward researchers based on a broader definition of quality of their research and their contribution to team and open science;
- Coordinate specifications of high-quality research and good research practices and use these to allocate funding within their own research institute and with other research institutes, universities and research funders.



Quality of research

Part of our task is to define the quality of a researcher and research products, and we have come to the following, non-mutually exclusive aspects:

- Impact in science, including the impact of a single article or of a person, either individually or as a team member;
- Innovation and novelty, including development/ engineering of new instrumentation, infrastructure or software;
- Correctness and accuracy;
- Reproducibility, including transparent research practices, e.g. data processing, data management and (agile) software development;
- Identifying when the risks are appropriate to the potential gain;
- Relevance to society;
- Providing a safe working environment and feedback mechanisms;
- Communication of scientific results in a broad sense.

We recognise that it will be a major challenge to 'objectively' rate these quality aspects of research in the competition of researchers for funding and positions. Yet, this challenge alone should not stop us from adopting a broader definition of quality.

Open science, diversity and team science

Open science is important for internationally competitive research practices and quality because research should be reproducible, usable and, where research is publicly funded, publicly available. Open science stimulates the flow of knowledge between researchers and research institutions, which ultimately benefits science as a whole.

Diversity is important for good research practices and quality, because it leads to diversity in views, practices and skills. It is also a fundamental principle of a fair society that researchers with, for example, different cultural backgrounds, genders and political views, all have an equal chance to contribute to the research community.

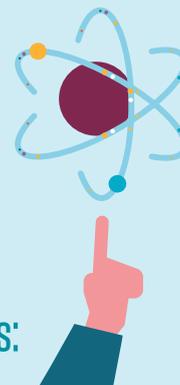
Team science is another important element of good research practices and quality. Within teams, group members who directly or indirectly benefit from research can develop their specific set of knowledge and skills and gain recognition for their contribution to science.

Points of interest

In the new system of recognition and rewards, it is crucial that research is evaluated based on quality and good scientific practice and that this evaluation is used during the allocation of positions and funding. It is also important that researchers are evaluated based on a diverse set of individual achievements as well as team efforts, and that contributions to science are valued even when they do not directly translate into publications. In addition to objective metrics, researchers can be evaluated based on a personal portfolio where people can include any other relevant information. Furthermore, there should be a work environment that is transparent and collaborative, in which colleagues feel free to ask for and receive feedback.

Changing a system will inevitably cause friction and resistance because, for many scientists, it is the system in which they matured and thrived. Hence, it will be important to work towards a commitment throughout the whole of NWO-I to contribute to this initiative. Ultimately, the goal of changes in the recognition and rewards system is to improve the research culture, make individual recognitions and rewards fairer and, most of all, realise more effective research. Some (members of) hiring committees or funding agencies will continue to evaluate researchers and research based on their existing approaches, either because they value this most or simply because they do not know how to do it differently. It is imperative that workshops are given to guide researchers in this new way of evaluating each other. These workshops could be integrated into a selection committee's workflow.

The Netherlands is taking an internationally leading role in changing this culture. This may present worries with regard to international careers because, in other countries, researchers and research might still be evaluated based on publication numbers and citation



Actions

We propose the following actions:

Develop an action plan to involve researchers in this new system of evaluation.

When hiring new people or promoting research staff to higher positions, committees should also evaluate candidates based on their research quality. A first suggestion is to include a personal portfolio in evaluations.

When hiring new people or giving promotions, committees can specify and communicate a priori defined research profiles that fit well into their strategy and/or department. This enables researchers to choose diverse career paths, based on their skills, experience and interest. Institutes should help and guide their researchers in choosing such a diverse and personal career path and in aligning their individual development with the strategy and development of the institute.

To improve accountability and good research practices, institutes should adopt feedback strategies, where there is two-way feedback between leaders and subordinates and peer feedback. NWO-I could even adopt feedback loops between institutes.

It is important that the NWO-I recognises and rewards the important role of qualitative software and data management practices better so that open science is contributed to and advanced, for example with awards or funding schemes.

Apply the NWO-I scientific integrity policy.

At NWO-I, supporting staff contribute to long-term monitoring and research development, which deserves more recognition and reward.

scores alone. However, in a new recognition and rewards system, performing high-quality research remains the primary goal of research institutions, which will reflect in the careers of individual researchers. Moreover, in the new recognition and rewards system, the recognition of publication records will not be abandoned, and so, individual researchers will still have the opportunity to focus on publication records if they are convinced that this is necessary for pursuing an international career.

Changes needed

In order to achieve this, NWO-I should:

- Perform evaluations with more focus on quality, good scientific practice and a diverse set of individual achievements as well as team efforts;
- Start applying an improved evaluation system during the allocation of positions and funding;
- Stimulate transparency in the workplace, collaboration and the feeling of being safe and free to ask for and receive feedback should be stimulated;
- Contribute as a whole to improve research culture, make individual recognitions and rewards fairer and, most of all, ensure this results in more effective research;
- Provide workshops and training to guide researchers in the new way of evaluation. For example, this could be integrated into a selection committee's workflow.

Impact

Defining research impact

Research impact is the process of creating a beneficial change or contribution to the world. Internal impact concerns the contribution within academia. It concerns the shifting of understanding, expansion of knowledge, the training of individuals through internships, PhDs, temporary visits to (international) collaborators, and finally open science including open-access works, codes, data, protocols, experiments and techniques.

Research also has external impact: impact beyond academia with contributions to the economy, society, public policy and the environment. Economic impact is expressed through patents, joint collaborations with for example industry, training of students with companies, the establishment of advanced scientific hubs, the creation of spinoffs from research projects, and direct knowledge, methods and code transfer to commercial parties. These can all be quantified as return on investment in research. Research is also essential for society as it provides knowledge and critical expertise for the community and for decision-makers. Researchers support the writing of laws and local, national, or international public policies, and enable the integration of the current state of knowledge in prevention and intervention efforts. Through outreach, researchers participate in the education of the entire of society and increase common knowledge. In addition, research plays a vital role in environmental protection and tackling global warming.

Assessing the economic and societal impact of fundamental research is challenging, as it usually takes place over a longer period of time and often involves a variety of individuals and institutes. Currently, neither the assessment of long-term impact nor efforts to establish short-term impact are viewed as core tasks of academic researchers, despite the time that many researchers spend on such activities. Also, research that was designed particularly for addressing questions relevant to the economy, society, or specific commercial or societal partners does not always receive the same level of acknowledgement in academia as research designed for addressing fundamental (academic) questions. Both types of research have merit and should be appreciated.



Vision

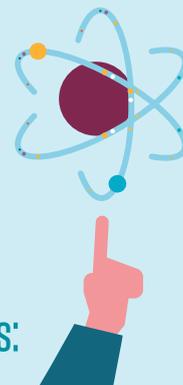
We envision a cultural change that properly acknowledges any effort towards knowledge exchange not limited to the internal academic community or a short-term economic drive.

To establish this, researchers need to be made aware of the various activities they can engage in to translate their research findings to economic or societal benefit. In turn, these efforts should be properly evaluated and best practices should be encouraged. It is also vital to create a common language through which researchers can communicate their outreach efforts to others, and to ensure sufficient acknowledgement of their work in national as well as international contexts.

Importantly, there is a need for new incentives to

1. engage broader audiences (e.g. citizen science),
2. recognise the role of scientific communication experts,
3. recognise the value of research projects that are developed specifically to address questions that arise in society or that follow from collaborations with commercial and societal partners,
4. have researchers engage actively in debates about current affairs in the media whenever expertise is needed,
5. have researchers be involved in scientific advisory positions, particularly the ones related to the missions carried out by the institutes,
6. have researchers engage actively in tasks that increase diversity in research, such as speaking in schools and at universities, and
7. have researchers engage in tasks that improve knowledge exchange processes between researchers on the one hand and industrial partners, societal partners and public agencies on the other. This can extend to implementing specific grant calls for impact-oriented projects and activities.





Actions

We propose the following actions:

Provide new skills and best practices to researchers in all stages of their careers to reach wider audiences and to perform better outreach activities. For example, outreach training activities could be included in the PhD course. As a recognition of outreach during the PhD, supervisors need to adjust their expectations of the number of academic publications to allow the PhD candidate time for engaging in outreach activities or other forms of impact.

Organise guidance and support for scientists by an outreach specialist or scientific communication expert. For example, such a specialist could be appointed at the institute or even for a specific research project or research group.

In any given project, one or more persons should focus on open science (uploading codes, methods, etc. in repositories, writing user manuals), outreach (popular summaries), and other forms of impact and receive similar credit for it.

Create profiles before hiring someone to reflect the required expertise (e.g. outreach, fundamental research) and ensure balance in the types of expertise at the institute and within a research project or research group.

Provide financial support for efforts that ensure open science (e.g. gold open access, time spent on writing user manuals) and outreach (e.g. travel costs to industrial partners, societal partners, and public agencies; time spent on communicating knowledge to a broader audience).

Report outreach and open science products alongside academic publications and presentations in performance and development meetings and in institute-wide annual overviews.

Research impact can happen at different scales: international, nationwide, at institutions, and at the level of individuals. Sometimes these levels are at odds with each other, and individual research activities and team or institute roles might not align. Even between researchers and the institute they work at, the aims for achieving societal or scientific impact might differ. The different missions for each level need to be clearly defined, so that possible divergent views can be detected and resolved through discussions. These conversations ask for the commitment, involvement and competence of all members of the institutes.

Changes needed

In order to achieve this, NWO-I should:

- Establish the recognition that research impact can go beyond scientific impact, and acknowledge the time it takes to establish such impact;
- Stimulate broad research impact and establish more awareness of the importance of such impact by providing skills and information to researchers;
- Create awareness that institute-level impact is important. Develop ways to recognise this as a team effort;
- Acknowledge that not every researcher has to excel in the myriad of tasks that modern researchers engage in. Specialisation can be as useful as versatility: some researchers may add value exclusively through their fundamental work, whereas others do so by making scientific knowledge accessible to a large audience. We need to make room for differential profiles in work evaluations.

.....

Establish an agreement between the researcher and supervisor on the amount and type of activities that the researcher wants to or is expected to do to establish societal and/or economic impact.

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Provide new skills to researchers to be able to communicate their outreach efforts in grant proposals and other evaluations.
Properly allocate time and resources for crucial activities that do not produce direct output, such as maintenance, methods/procedures development, data management, participation in committees, etc.

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Award co-authorship to researchers who took part in a project by working on data collection, development of protocols, outreach, open science, communication with industrial or societal partners, or any other task that aided in improving science.

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Organise events like open days or national research seminars (e.g. Nacht van Kunst & Wetenschap) to stimulate the communication of knowledge to students, journalists, practitioners or laypersons, as well as between researchers and industrial and societal partners.

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Award DOIs to software and data products and stimulate proper referencing.

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Put in place long-term feedback loops to evaluate impact-oriented initiatives and pinpoint best practices.

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Education

In the NWO-I context, education is about acquiring, communicating and sharing knowledge and skills in any form to any type of audience. It addresses a variety of purposes and different target groups. The target groups can be categorised into i) team members via training and mentoring; ii) students via supervision of internships and lectures; and iii) peers via seminars.

The education of NWO-I staff is important to maintain a high standard and good practice for the research to be carried out.

Supervision, seminars, and lectures can be considered part of the larger

scheme for knowledge transfer. As such, the national institutes supplement schools and universities.

Examples are internships from vocational (MBO), higher vocational (HBO), and university (WO) projects.

The education of fellows is about connecting people between institutions and disciplines. This includes visiting professors or other kinds of visits. Education with regard to the general public and beyond science is addressed in the chapter on Impact.



Providing and receiving education shares knowledge, motivates people and improves research. So, there is a benefit for the teacher, the student and the institute. The connection to schools and universities contributes to an open, diverse and dynamic environment that inspires people and enriches research. It also provides an opportunity to attract people from diverse backgrounds for a subsequent career path in research. The motivation for lecturing can differ from person to person and may also relate to career perspectives within the institute or at a university. For example, it can be useful (it is said that one really learns a science when lecturing it), inspiring (e.g. by working in a different setting) and rewarding (e.g. via feedback). For some researchers, the drive to educate can go beyond the obvious benefits. They may simply like to teach and share knowledge, and lectures by someone from a national research institute can enrich the curriculum of universities and keep it up-to-date with the latest developments in the field.

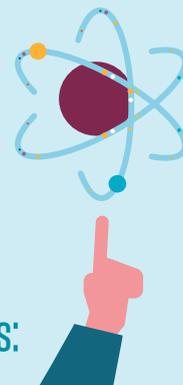
Vision

Each NWO-I institute aims for top-level research and should therefore provide an inspiring environment for the education and training of people, with programmes that are geared towards equipping them with the highest possible level of knowledge and skills. The mix of students, engineers and researchers working in such an environment should also offer opportunities to learn from each other.

Education involves an active engagement and a transparent attitude from all NWO-I employees. For the national role of an institute, education is particularly important as a means of maintaining the knowledge and skills to continue the research in a specialised field and to explore new research opportunities, for example via R&D. In view of the fundamental nature of the research carried out this is not driven by commerce but solely by curiosity. NWO-I nonetheless sees a clear connection between education in the NWO-I context and impact on society and our national role.

Education is tightly linked to the national role and the mission of the institutes. It connects our researchers to the wider Dutch research community. Therefore, NWO-I supports our researchers in their educational tasks and stimulates a cooperative attitude towards possibilities or wishes regarding career-oriented measures that may occur in individual cases. NWO-I also supports the means to focus or redirect research activities, for example in the form of sabbatical leave





and stimulating mobility. NWO-I would like to see more support in making the connection to future employment. For example, when PhD candidates or postdocs wish to obtain a BKO (University Teaching Qualification), a useful tool for connecting to the labour market), NWO-I must recognise this wish, comply with it and give it due recognition.

In the position of professor by special appointment ('bijzonder hoogleraar'), education is seen as an important part of the job which is performed at the universities. The teaching could be formalised (e.g. part-time job rather than professor by special appointment), thereby establishing an enduring connection between a national institute and a university. Finally, seminars and the like are a means of personally communicating science to a possibly wide audience. NWO-I also supports career paths when an assignment of professor by special appointment ('bijzonder hoogleraar') ends. It should be made clear that this is a temporary position and that efforts need to be taken to make it into a part-time job at a university should researchers wish to continue their teaching.

Changes needed

In order to achieve this, NWO-I should:

- Create awareness of the possibilities of teaching and stimulate these;
- Recognise (interdisciplinary) mobility as part of education;
- Acknowledge the importance of education, teaching and sharing knowledge and support these tasks;
- Make recognition for educational tasks more visible;
- Assess teaching skills;
- Recognise the role of professor by special appointment ('bijzonder hoogleraar');
- Provide support to employees who supervise, coach or mentor;
- Make support for personal development and training easily available.

Actions

We propose the following actions:

Make mentoring and teaching possibilities more visible and transparent.

Make (interdisciplinary) mobility possibilities more visible and transparent.

Have clear agreements on the time spent on education and do not exceed the equivalent of a full-time appointment, so that staff will not be appointed to work more than the maximum of 100% employment.

Provide support for educational tasks, for example, by appointing an education coordinator at the institute, such as at NIOZ.

Make the visibility of educational tasks concrete by including it in the evaluation of institutes, teams and individuals.

Formalise relationships between a professor by special appointment ('bijzonder hoogleraar') and the university.

Obtain feedback from universities on teaching skills as a part of the performance and development process and PhD evaluations.

If applicable, make education part of the job description and take it into account in the hiring process.

Provide personal development and training opportunities.

Set up a designated PhD board to make an inventory of training needs and suggestions of PhD candidates and postdocs, such as at KNAW.

Executive summary

The current standards for recognising and rewarding talent in academia need to be modernised to realise a more inclusive, balanced and high-quality environment for research. The future recognition and rewards should not merely focus on publishing and grant applications, but touch upon multiple different tasks and domains, in varying degrees. At NWO-I, these tasks mainly revolve around research, education, leadership, impact and the national role of the institutes. With this vision, NWO-I embraces the national and international effort to modernise our definitions for academic success.

The NWO-I committee on Recognition & Rewards has developed a vision that involves a cultural change regarding research, education, impact, leadership and the national role, including proposed changes and action points. The vision is not an endpoint for recognition and rewards, but rather the start of a continuous process. The proposed changes and action points also link to other disciplines, such as communications and human resource management. The success of the vision depends on the commitment of all staff of NWO-I.

The committee welcomes ideas from inside and outside the NWO organisation to further develop the vision and to stimulate the required cultural change. The committee recognises that a cultural change takes time and will require a continuous dialogue at the local, national and international levels. The committee foresees that there will not be one single solution to implement this cultural change. Instead, a consistent set of solutions, each implemented in due course, subsequently monitored and possibly adjusted, will help academia to realise the necessary steps forward.

List of committee members

'NWO-I Committee on Recognition & Rewards'

Current members

Name	Role	Organisational unit
Michael Wise	Chair/professor	Directors meeting, SRON
Laura Jussen	Project leader/policy advisor	Bureau
Anna van der Kaaden	PhD candidate	NIOZ
Ilan Shlesinger	Postdoc	AMOLF
Bart Weber	Tenure tracker	ARCNL
André Offringa	Tenured researcher	ASTRON
Evelien Hoeben	Tenured researcher	NSCR
Lynda Hardman	Professor	CWI
Maarten de Jong	Professor	Nikhef
Jan Geralt bij de Vaate	Technical/engineering member	SRON
Eileen van den Tweel	HRM	HRM, Bureau
Linda Berkhout	HRM	HRM, AMOLF
Sandra Liefhebber	HRM	HRM, NIOZ
Henk Tamsma	HRM	HRM, DIFFER
Erik Arends	Communications advisor	Communication, SRON
Rob Detmers	Policy advisor	SRON

Previous members

Name	Role	Organisational unit
Dick van Oevelen	Senior researcher	NIOZ
Veroni Eichelsheim	Senior researcher	NSCR
Ghislaine de Meij	HRM	HRM, Bureau
Freya Senf	Institute manager	Institute managers meeting, DIFFER

Colophon

NWO-I

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