



Millions in grants for UG researchers from Gravitation programme

Researchers from our university are making an important contribution to research projects which have been awarded millions of euros in grants by the Gravitation programme. The University of Groningen (UG) is involved in four out of six projects that have been selected. Researchers from the Faculty of Behavioural and Social Sciences are leading the SCOOP project. Researchers from Arts, Science & Engineering and the UMCG are contributing to the OIKOS (coordinator Radboud University), Organs-on-Chips (coordinator Leiden University) and BaSyC (coordinator TU Delft) projects. All projects have been awarded EUR 18,8 million.



Rector Magnificus Elmer Sterken:

'The Gravitation programme is one of the main sources of funding for academic research in the Netherlands. The strength of this programme lies in the collaboration of excellent researchers from various Dutch universities. I am very pleased that the University of Groningen is making a substantial contribution to the projects which have been awarded grants. It confirms the status of researchers connected to our University.'



Heymansbuilding, Faculty of Behavioural and Social Sciences
Photo: Michel de Groot

Gravitation

The Dutch government has been using the Gravitation programme since 2012 to stimulate excellent research at Dutch universities. The Ministry of Education, Culture and Science (OCW) has asked the Netherlands Organisation for Scientific Research (NWO) to conduct the selection procedure for Gravitation.

Gravitation is a funding instrument intended for academic consortia that perform innovative and influential research. A consortium is a collaboration between the best researchers in the Netherlands in one or multiple disciplines. Consortia may originate at Dutch research schools but also from influential top researchers and research groups joining forces.

UG to coordinate SCOOP Gravitation project

‘No resilience without cooperation’



Rafael Wittek

NWO
 Gravitation
 programme
 € 18.8 million

With a grant of EUR 18.8 million from the NWO Gravitation programme, the interdisciplinary research programme SCOOP has received one of the largest grants ever awarded for a project in the humanities and social sciences in the Netherlands. The University of Groningen will coordinate the project. Project leader Rafael Wittek, Professor of Sociology at the Faculty of Behavioural and Social Sciences, talks about the project SCOOP.

SCOOP stands for Sustainable Cooperation: Roadmaps to a Resilient Society: What exactly does that mean?

‘By now we know reasonably well how to get people to cooperate effectively. What we don’t know yet is how to keep it that way in the long term, especially in unsettled times, periods in which many developments take place simultaneously and collaborations become strained. Which arrangements will have to be made to preserve a collaboration so that it creates value for the group, without causing damage to the environment, and at the same time ensuring that all participants remain enthusiastic? That is the key problem that we examine.’

Does value exclusively refer to economic value here?

‘Not at all. It does refer to social welfare, which has a material as well as a financial component, but it also refers to social capital: a society where you can rely on receiving care from those who care about you, on getting emotional support. Our research seamlessly connects with the UG’s strategic Sustainable Society theme as well as with the Institutions for Open Societies at Utrecht University, our main partner in SCOOP.’

How important is cooperation in keeping a society resilient?

‘Our assumption is that there is no resilience without cooperation. People seek cooperation whenever they cannot handle something on their own. This is at the heart of our society.’

Why do you want to examine those collaborations?

‘Our research is partly driven by recent developments such as ageing populations, migration and technological developments such as the internet. Many certainties are under pressure. The next generation will no longer be familiar with the concept of permanent employment. So, will there be structures to replace it? In SCOOP we focus on three policy domains: care, labour and inclusion.’

The research programme is a collaboration between historians, sociologists, psychologists and philosophers. How special is that?

‘We are all engaged in the research area of cooperation, at various universities. The fact that we come from vastly different disciplines makes it special. It took a while for us to speak the same language after we started SCOOP in 2011. That multidisciplinary has now been rewarded by the Netherlands Organisation for Scientific Research (NWO).’

What will you be able to do thanks to the Gravitation grant?

‘Over the next few years, we will be able to appoint 80 PhD students to perform research together with external stakeholders and co-supervisors. We will train a new generation of academics to be interdisciplinary and to analyse issues regarding sustainable cooperation. We would never have been able to do so without this grant.’

What does SCOOP bring society?

‘A lot. First of all, we will be testing which interventions work best in different practical cases. This will yield evidence-based recommendations on cooperation with concrete benefits for



Photo: EPA/Kim Ludbrook

companies and policymaking organizations. In addition, we will collect data and develop a new method of combining different forms of data, ranging from micro measurements to macro observations and from source research to experiments, and making substantiated statements about these data. Ultimately, this should lead to a model that specifies the conditions under which sustainable collaborations thrive, even when societies change. To give a concrete example, if the earthquakes in the province of Groningen force parents to move and schools to close, how can society still succeed in continuously offering children high-quality education? Our model must be able to answer that question.’

SCOOP is a collaboration between the University of Groningen and Utrecht University, VU University Amsterdam, Radboud University Nijmegen and Erasmus University Rotterdam.

The main applicants are:

- > Theoretical sociologist Rafael Wittek, University of Groningen. *Specialism:* the dynamics of social networks.
- > Social psychologist Naomi Ellemers, Utrecht University. *Specialism:* group processes and relations between groups.
- > Philosopher Martin van Hees, VU University Amsterdam. *Specialism:* moral responsibility and the freedom of the individual.
- > Sociologist Tanja van der Lippe, Utrecht University. *Specialism:* the relationship between work and family.
- > Social psychologist Russell Spears, University of Groningen. *Specialism:* social identity.
- > Economic historian Bas van Bavel, Utrecht University. *Specialism:* why some societies are prosperous and successful and others are not.

Professors Agnes Akkerman, Andreas Flache, Pauline Kleingeld, Jan-Willem Romeijn and Linda Steg also participate in SCOOP on behalf of the University of Groningen.

Bert Poolman



BaSyC, building a synthetic cell

The BaSyC Gravitation programme has a striking and ambitious goal: to build a synthetic cell from separate components. This cell could be ready within the project’s ten-year term, says Professor of Biochemistry Bert Poolman, who is the coordinator of the Groningen contribution to this project, led by TU Delft.

‘We aim to develop a synthetic cell that can generate its own building blocks, provide for long-term energy needs and divide several times at least’, Poolman explains. The approach is to base the design of important systems, such as energy production or cell division, on nature’s simplest systems. If a system functions properly, the researchers can use the corresponding genes to create a synthetic chromosome, thus turning lifeless matter into a living cell. ‘Only in this way can we really learn how life works’, says Poolman. He thinks ‘cell factories’, cells designed to produce useful substances, will be the most practical application of that knowledge. ‘In addition, we use all kinds of cell-like vesicles in medicine to deliver pharmaceuticals to the right place, at the right time. Synthetic cells will also be essential to the further development of that process.’

Five Groningen-based groups participate in the project, making the University of Groningen the largest contributor after TU Delft. Wageningen University, VU/Amolf and Radboud University Nijmegen also provide important expertise. Groningen is mainly responsible for the metabolism, the production of the cell membrane and the simulations of the system (see also www.rug.nl/sciencelinx-origins). Delft will design the cell-division mechanism. Participating Professors in BaSyC include Bert Poolman (one of the six main applicants), Arnold Driessen, Matthias Heinemann, Siewert-Jan Marrink and Dirk-Jan Slotboom.

The total budget is around EUR 25 million, including the matching funding from the universities, which will allow approximately 70 to 80 PhD students to do research within BaSyC.



Onno van Nijf



OIKOS – tradition and innovation ancient Greek and Romans

The ancient Greeks and Romans were great innovators. New ideas abounded, not just in science and technology, but also in literature and arts, politics, the economy and many other domains of life. How did those innovations come about and how did they turn into actual innovation? This is the research question of the Gravitation proposal by a team of classicists collaborating in the national research school in Classical Studies, OIKOS.

The hypothesis of this research agenda is that tradition and innovation are not simply juxtaposed or even opposed. In successful innovations, people perceive a meaningful coherence between the new and the familiar. For this phenomenon OIKOS uses the concept of 'anchoring'. Developing this concept in an investigation of Greco-Roman antiquity results in a new and better understanding of innovation processes of all times.

The Gravitation proposal was developed by a large team of Dutch classicists, led by Prof. Ineke Sluiter (Leiden University, main applicant) and Prof. André Lardinois (Radboud University). Radboud University submitted the proposal to NWO.

The University of Groningen is represented in OIKOS by ancient historian Prof. Onno van Nijf, who together with Prof. Ruurd Nauta (Latin) led a pilot project called 'After the Crisis' (www.afterthecrisis.nl). This research project has investigated the responses of individuals and communities to war, violence, and disruption in the ancient Roman Empire. The project focuses on the (civil) wars of the first century BCE and their repercussions at Rome and in the Roman East. Prof. Van Nijf: 'In this project classicists and ancient historians actively collaborated with modern historians and colleagues of international relations. It clearly shows how an interdisciplinary approach within the field of classical studies can be successful.'

For this ten-year research agenda, the team of 12 applicants has been awarded a Gravitation grant of 18.8 million EUR. This is a unique achievement for the Humanities.

Cisca Wijmenga



Organs-on-chips – miniature organs for research purposes

It may sound futuristic, but it is possible: making miniature versions of the organs of patients and using them to study the development and treatment of diseases. This is what researchers of the LUMC, the University of Twente (UT), TU Delft, the Hubrecht Institute and Cisca Wijmenga at the UMCG aim to achieve in the next ten years.

Growing live human cells and tissues outside the body takes place in 'organs-on-chips': small compartments on a silicon chip that simulate the conditions in the body. This is done with the help of tiny canals in the chips, which allow the accurate administration of tiny amounts of fluid to feed the growing cells. The fluid is fed and discharged through miniature pumps, and the behaviour of the cells can be measured using sensors.

'In fact, you are creating a small part of an organ', says Professor of Developmental Biology Christine Mummery of the LUMC and the UT. Mummery is the leader of the project which involves five other renowned scientists: neurologist Michel Ferrari (LUMC), nanotechnologists Albert van den Berg (UT) and Lina Sarro (TU Delft), cellular biologist Hans Clevers (Hubrecht Institute) and human geneticist Cisca Wijmenga (UMCG).

These researchers have been cooperating on Human Organ and Disease Model Technologies (www.hdmt.technology) for some time. Their focus is on generating heart, brain, intestinal and blood vessel cells, which they grow from the stem cells of patients with certain diseases and which form the basis of the chip organs that function similarly to organs in the human body.

The UMCG-research studies the influence of a disrupted balance of the intestinal bacteria – 'the microbiome' – on cardiovascular diseases. With three different organs-on-a-chip – attached to each other – mutual influence is being studied. 'In this way you can study the underlying effects of healthy and sick organs and research what happens with the brains or the heart if intestinal bacteria get disrupted', says Wijmenga.