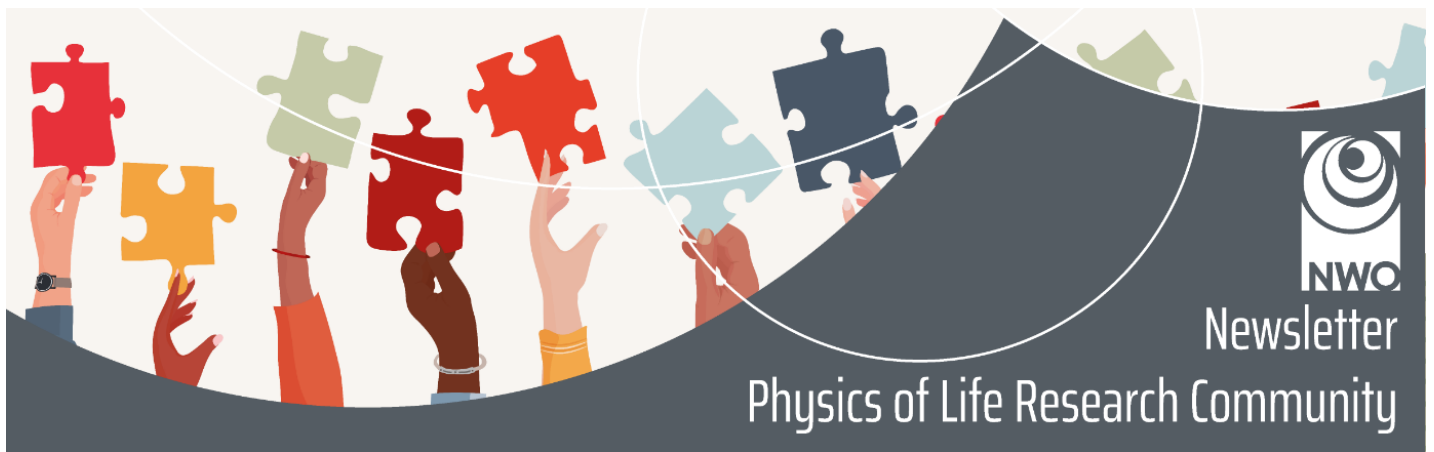




Newsletter Physics of Life Research Community
6 March 2025

Dear registered members of the research community physics of life,

Our first newsletter of 2025! It contains information on the upcoming events and includes some relevant updates on research policy. We are eager to hear about any suggestions you may have, and we look forward to meeting you at our assemblies.

Please spread the word about our community with all your POL colleagues! They will receive future newsletters and event invitations by registering, without any obligations, following this link:

<https://www.nwo.nl/en/register-for-research-community-for-physics>

Content of this newsletter:

- News from the research community, the committee and the Round Table Physics
- Opportunities for fuelling synergy between Dutch and UK Physics of Life (by Mark Leake)
- Community meetings
- Physics of life calendar
- Projects granted by NWO
- Bio sketch by Ivana Lin (University of Twente)

Best regards,

on behalf of the research community committee POL,

Kristina Ganzinger (AMOLF) and Naomi Chrispijn (NWO, Dutch Research Council)



NWO Physics of Life research community committee:

Prof. Alessandra Cambi (RUMC)
Prof. Remus T. Dame (LEI)
Dr. David Dulin (VU)
Dr. Kristina Ganzinger (AMOLF; chair)
Dr. Kristin Größmayer (TUD; vice-chair)
Dr. Johannes Hohlbein (WUR; Round Table Physics member)
Prof. Lukas Kapitein (UU)
Prof. Armagan Kocer (UT)
Dr. Nicholas Kurniawan (TU/e)
Dr. Kasia Tych (RUG)
Secretary: Dr. Naomi Chrispijn (NWO)

Website: www.nwobiophysics.nl/pol



Dr Naomi Chrispijn-Steenbeek
Programme officer

+31 (0)70 349 4063
+31 (0)6 1274 5856

n.chrispijn@nwo.nl
ResearchCommunity-PoL@nwo.nl

Team
NWO Domain Science

New appointments, grants, prizes, and other news

- Large-scale research infrastructures, including plans, which are not yet included on the current Large-Scale Research Infrastructure Landscape are invited to apply and update their information, in order to be included on the new Large-Scale Research Infrastructure (LSRI) Landscape. Inclusion on the Landscape LSRI provides visibility of the research infrastructure to potential users. In addition, the Landscape LSRI is also important for policy makers and ministries. [Read more >](#)
 - Coming to APS March Meeting and want to meet fellow biophysicists? Volunteer to run the DBIO table and represent our community! Sign up [here](#). [Read more >](#)
 - 24 – 28 March the 10th annual Biophysics week will take place [Read more >](#)
 - New early career network established: NextGenPhys@NL, which is a new independent network created to unite and empower emerging physics researchers in the Netherlands. NextGenPhys@NL will focus both on meeting current challenges as well as about creating a vibrant ecosystem where emerging physicists drive research innovation, influence funding strategies, and shape a sustainable future for physics in the Netherlands. Interested to become a (board) member? Reach out to the founding members. [Read more >](#)
 - Possibility for outreach at Lowlands. Lowlands, the NWA, New Scientist and BKB | The Campaign Office invite scientists to submit a research proposal to perform at Lowlands Science. On August 15-17, festival-goers from all over the Netherlands will flock to Biddinghuizen for one of the Netherlands' largest and best-known festivals. Researchers can now submit their research proposal that will allow them to collect data on the Lowlands Science grounds while introducing festival visitors to scientific research in an accessible way. Application for this unique way of doing research can be done until March 28, 2024 at the latest. [Read more >](#)
 - Coming up: the fourth edition of the NWO Physics of Life Seminar. The organisers Florian Berger (UU), Marianne Bauer (TUD), and Ioana Ilie (UvA) are preparing the next edition to take place within this seminar series. The seminar will likely take place before summer in Utrecht. Invitations will be circulated in due time. If you have a suggestion for a speaker for one of the upcoming seminars, please [get in touch!](#)
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News from the Research Community Committee and Round Table Physics (RTP)

The committee has added three new members as of 1st of January 2025: Prof. Armagan Kocer (UT), dr. David Dulin (VU), and Kasia Tych (RUG). We're very happy they accepted our invitation. We said goodbye to three members: Mattijs de Groot (LUMICKS), Greg Stephens (VU), and Rifka Vlijm (RUG). We thank them for their contributions over the past years and look forward to meet again at one of our assemblies. If you have any ideas on what this committee should act upon additionally to what our focus already is, please share your thoughts with one of the members.

Johannes Hohlbein (WUR) took over Kristina Ganzinger's (AMOLF) position in the Round Table Physics (1-1-2025). Kristina is still the chair of our committee and in July this year, we will welcome Jeroen van Zon (AMOLF) as a new member. Kristin Grussmayer (TUD) will become our new chair. Each research community committee in physics has a representative in the RTP. So ideas that are relevant for the whole physics community you can from now on share them with Johannes.

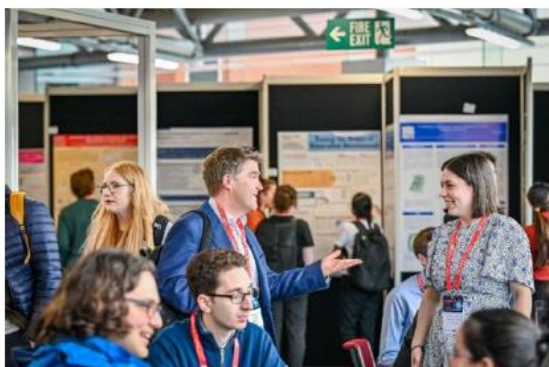
Talking points during the RTP meeting included BiBB: Liedewij Laan (TUD) introduced the BiBB (Beta in Bestuur & Beleid) initiative that aims at enhancing the presence of STEM-trained professionals in Dutch political and civil service roles (<https://www.betainbestuurenbeleid.nl/en>). Marleen Kamperman (former chair of the research community committee [FSM](#)) reported on her involvement in the working group on evidence based CVs. The RTP also looked back at the annual Strategic Evening at NWO Physics, which was hosted jointly by the NWO RTP and the NWO Domain Science on 20 January. The Round Tables are also preparing a meeting to discuss strategic topics in more depth amongst each other (a so-called heisessie). The different research community committees are welcome to provide input for topics for them to discuss. Lastly, the RTP discussed the current budget cuts which are ongoing at universities and how this affects physics researchers in the Netherlands.

Opportunities for fuelling synergy between Dutch and UK Physics of Life

The Physics of Life research community in the UK is currently going through a Roadmap process to map out transformative future opportunities, how best to resource these, the impact that these may have on national research infrastructure and culture, and underpinning aspects of early career training and support in interdisciplinary science. Overseen by the UK's Physics of Life network PoLNET (<https://www.physicsoflife.org.uk/>), this process has involved extensive consultation with the research community comprising in-person meetings, breakout discussions, community surveys, webinars and data mining of research grants and outputs. One emerging outcome of these discussions has involved the prospect for enhancing the opportunities to reach out to relevant international partners in the Physics of Life. In particular, Dutch and UK Physics of Life research communities exhibit potential for areas of valuable complementarity in scientific expertise and interests; coupled to relative geographical closeness, this could offer scope to nurture new collaborative opportunities at the physical and life sciences interface, for example at the level of developing new reciprocal secondment/exchange agreements at a national level involving junior researchers, establishing co-badged workshops focused around common transformative scientific themes, and potentially framing new joint research funding programmes. The year 2023 saw the inaugural meeting of the UK Physics of Life conference in the beautiful North Yorkshire spa town of Harrogate (Figure 1), involving approximately 500 participants across all career levels of Physics of Life research. This now biennial conference will be repeated 24-27 March 2025 <https://iop.eventsair.com/pol2025/> and will include a dedicated Roadmap session on 26 March which will allow the key findings of the UK's Roadmap to be articulated and discussed. It represents a fantastic opportunity for Dutch colleagues to attend and express their views, to help us both navigate exciting new international research activities for the Physics of Life.

Mark Leake, mark.leake@york.ac.uk

Prof Leake holds the Chair of Biological Physics at the University of York and is the Chair of the UK Physics of Life network support by the Engineering and Physical Science Research Council EPSRC (ref. EP/T022000/1).



The UK Physics of Life 2023 conference attracted ~500 participants across all career levels integrating physical and life sciences, and experimental, theory and computational approaches. It seeded discussions which cut across a range of stakeholders at the physical-life interface science, with the forthcoming Physics of Life 2025 meeting 24-27 March offering potential opportunities to discuss future international engagement, such as between Dutch and UK researchers.



Help your fellow biophysicists to be aware of the interesting conferences available.

Submit information on conferences, symposia, colloquiums etc. via <https://nwobiophysics.nl/calendar>

The picture is a screenshot of the longlist of calendar items listed on our website.

Physics Of Living Matter  (Harrogate, UK)	24-27 March 2025	Physics of Life 2025 is large-scale biennial conference representing the wide diversity of the UK biological physics community. Organised jointly by PoLNet3, IOP Biological Physics, the British Biophysical Society, Physics of Living Matter and Physics meets Biology, this in-person meeting will project the excitement of science at the interface between physics and biology.
The Biophysics of Motile Cilia - from Structure to Function  (Bad Honnef, DE)	30 March - 3 April 2025	The aim of this seminar is to bring together scientists from different disciplines to address the physical, biological, and clinical aspects of motile cilia.
Kinetics2025 advanced-level course  (Paris, FR)	31 March - 4 April 2025	Several top-level scientists and instrument manufacturers will take part in this exciting theoretical/practical course organized in the frame of the European project MOSBRI (Molecular-Scale Biophysics Research Infrastructure).
Groupe d'Etudes des Membranes Meeting  (Boulogne-sur-mer, FR)	1 - 4 April 2025	The conference brings together researchers in biology, biochemistry, biophysics, physics, and chemistry with the aim to delve into the structure, dynamics, and overall function of membranes.
Structural and functional asymmetry of plasma membranes Faraday Discussion  (London, UK)	23 - 25 April 2025	The Faraday Discussions are unique international discussion meetings that address current and emerging topics at the forefront of the physical sciences.
EMBL Symposium Theory and concepts in biology (EMBL Heidelberg and Virtual)	6 - 9 May 2025	This meeting is the 2nd edition in a series of symposia aiming to bring together a diverse community of researchers interested in finding ways to transform into conceptual knowledge the ever-increasing amount of factual knowledge produced by biological research.
WomenNetPhysics 2025  (Eindhoven)	9 May 2025	A networking event aimed at the theme of the position of women in physics, and everyone is welcome to participate.
Innovative Imaging for 3D Cell Biology  (Utrecht)	17 - 18 June 2025	Conference hosted by the NWO Gravitation project IMAGINE! together with NL-Biolmaging and 3D-NI. Highlights include lectures by the esteemed Scientific Advisory Board of IMAGINE!
NextGenChem  (Enschede)	19 - 20 June 2025	A symposium designed specifically for early-career group leaders working in and interfacing with chemistry.
15th European Biophysics Congress  (Rome, IT)	30 June - 4 July 2025	European Biophysics Congress
SynCell2025  (Stanford, US)	9 - 11 September 2025	International conference on engineering synthetic cells and organelles
CELL PHYSICS 2025  (Saarbrücken, DE)	7 - 9 October 2025	International meeting intended to be an interdisciplinary platform for scientific exchange between participants from cell biology and biophysics, both represented in roughly equal numbers.
CellMech 2025  (Leuven, BE)	30 Sept - 3 Oct 2025	CellMech brings together physicists, biologists, engineers, and mathematicians to discuss the advancements in cellular mechanobiology.

Projects granted by NWO



The projects listed are the projects granted by NWO that have a connection with Physics of Life. Please follow the links for full granting information.

Vici

[Read more>](#)

Battle at the Wall: The mechanical weapons of plant killers

Joris Sprakel (WUR)

Fungi and other filamentous pathogens are an enormous threat to plant health, especially as climate change makes plants increasingly vulnerable. One aspect of how these plant killers infect plants remains enigmatic: How do they get in? Pathogens must force their way through the protective surface of the plant to enter its tissues. This project, which features a unique combination of physics, chemistry, and biology, will study the mechanical weapons pathogens use to break through the plant's defenses. The insights this project generates will form a basis for a completely new perspective on how we could protect crops from disease.

How to kill superbugs?

Markus Weingarth (UU)

Extremely drug-resistant pathogenic bacteria, so-called superbugs, are a major cause of human death. Superbugs are often protected against antibiotics by a massive cell envelope, a wall-like structure that surrounds them like a thick armour. On the other hand, since the envelope is essential, antibiotics that directly target the bacterial armour could make powerful drugs. Unfortunately, the mechanisms how these drugs work are not well understood due to technical challenges. This project will develop concepts and technologies to study these 'envelope-targeting antibiotics' in detail, focusing on antibiotics against the most dangerous superbugs: Gram-negative bacteria and Mycobacteria.

Understanding mRNA decoding; how mRNA translation kinetics shape gene expression

Marvin Tanenbaum (Hubrecht Institute)

Genes contain all the information needed to assemble proteins. However, recent work has identified a hidden layer of information inside genes that instructs not only which proteins to produce, but also how much protein to produce. In this project, we will use cutting-edge microscopy methods to bring this hidden layer into view to understand how it works, and how viruses use the hidden information in genes to translate their own proteins in host cells.

The road to success: sperm capacitation and egg interactions

Tzviya Zeev-Ben-Mordehai (UU)

Mammalian fertilization is fundamental to our existence, and its success depends on sperm and egg union. Sperm produced in the male have a long journey through the female reproductive tract. Depending on the stage of the journey, sperm exhibit different motility patterns. In this project, we will study how the sperm tail regulates these different motility patterns and how sperm establish an interaction with an egg. Gaining a deeper understanding of these processes could lead to improved assisted reproductive technologies, for which there is a growing demand and may contribute to the development of male contraceptives.

Open Competition XS

[Read more >](#)

HIV latency: identifying what keeps the virus dormant

Maike Hansen (RU)

HIV remains a pressing global health threat, affecting millions worldwide. HIV infected cells can be found in two states, either actively replicating, where HIV is killing a patient's immune cells as it spreads; or in a dormant state, called latency, where HIV is quietly hiding and cannot be targeted by drug treatment. HIV latency is the major barrier to an HIV cure. In this project, we will study how HIV remains dormant and hides within human cells with the ultimate goal of devising a new strategy to minimize the latent HIV population within patients.

Sustainable electronics via Printing of recycled liquid Metals (SusPrintMet)

Ivana Qianqi Lin (UT)

Every year, more than 50 million tons of electronic waste (e-waste) are generated globally. e-waste recycling is urgent but hampered by key bottlenecks in metal recovery, including material complexity, harmful emissions, high energy consumption, and infrastructure limitations. This project aims to revolutionize e-waste recycling by using liquid metals (LMs) owing to their low melting points. We will introduce a sustainable technique and protocol for printing electronics using recycled LMs. We will develop a low-cost setup for widespread use, paving the way for DIY metallic electronics and in-house recycling as the future for sustainability.

Enhancing Brain Cancer Surgery: Visualizing Tumor Boundaries and Nerve Pathways with Back-Scattered Light

Miriam Menzel (TUD)

Brain cancer surgeries carry a high risk. If important nerve pathways get damaged, the patient might suffer from severe neurological deficits, if the tumor is not entirely removed, the chance of survival is significantly reduced. To increase the survival of brain cancer patients, it is crucial to rapidly and accurately assess tumor boundaries and nearby nerves during surgery. However, current techniques are either not fast enough for intraoperative use or fail to visualize densely interwoven nerves. In this project, we explore the use of back-scattered light for determining tumor boundaries and visualizing highly interwoven nerve pathways on brain tissue surfaces.

Open Competition M

[Read more >](#)

How does USP7 select its targets

Titia Sixma (NKI)

Here we study the regulation of USP7 to understand when and where it is active. We use a combined chemical and biochemical approach to create stable USP7 activation states in vitro. We will use biochemistry, structural biology and proteomics to analyze changes in activity, structure and interactome. This will give insight in the regulation of the crucial signalling enzyme.

The power of immune cells

Daan Vorselen (WUR)

Immune cells need to remove invaders and damaged materials from our bodies. We will develop new technology to observe the "table manners" of these cells. By measuring the forces that immune cells exert, we will precisely determine how they grab and engulf their targets. We will study this process in small transparent zebrafish. This will be the first time to observe how this process exactly proceeds in a living animal. By gaining a better understanding of the eating behaviour of immune cells, we will ultimately be able to better modulate it in disease.

Tell me how it begins, I will tell you how it ends: catching transcription at the start

David Dulin (VU)

To function, our cells need proteins, which are made by ribosomes, which are partly constituted of ribosomal RNAs synthesized in our cells by RNA polymerase 1 (Pol I). Pol I activity is essential during cell growth, and central in the development of many cancers. Ribosome assembly is mainly regulated at the start of ribosomal RNA synthesis by Pol I. Here, we will employ cutting edge biophysics techniques to reveal how this process is controlled one Pol I molecule at a time.

A kill-switch as bacterial immune system

Daan Swarts (WUR) & Chirlmin Joo (TUD)

Just like humans, bacteria use immune systems to protect themselves against viruses. A recently discovered bacterial immune system named 'SPARTA' can recognize viral DNA, after which it will sacrifice the bacterial cell to prevent spread of the virus. We will investigate how SPARTA specifically recognizes the viral DNA, and which checkpoints it needs to pass before this 'kill-switch' is activated, without inducing autoimmunity. By comparing SPARTA mechanisms to mechanisms of other immune systems we will enhance our understanding of bacterial immune systems. This will contribute to the development of programmable virus-detection tools.

A Twist in the Tail: Exploring Chiral Interactions in Liquid Crystals for Biosensing

Lisa Tran (UU) & Siddharth Deshpande (WUR)

There is an urgent need to make biosensors fast, affordable, and sensitive, while maintaining molecular specificity. Here, we will use liquid crystals, famous for display technologies, to produce color-changing emulsions as biosensing platforms that address these needs. Using high-resolution microscopy, spectroscopy, and lab-on-a-chip technologies, we will systematically characterize how chiral liquid crystals are impacted by target molecule structures to produce diverse color-changing signals. Beyond the innovation of accessible, specific, and quantitative biosensors, our findings will shed light on chiral organization in crowded environments, relevant to biological systems.

Open Competition XL

[Read more >](#)

Approaching De-Novo Life

Prof Sijbren Otto (RUG)

Co-applicants: Siewert-Jan Marrink (RUG); Anouk Rijs (VU); Evan Spruijt (RU); Sabeth Verpoorte (RUG)

The researchers aim to create, for the first time, a minimal form of life from synthetic molecules. They will take a system that is able to replicate (i.e. make copies of itself) and metabolize (construct its own components from material in its environment) and make it produce its own cell-like compartments. They will then make these systems grow and divide and undergo Darwinian evolution. The research involves a collaboration between experts in chemistry, microfluidics, mass spectrometry, computer simulations, and early evolution theory. This work touches on existential questions like: "Why is there life?" and "Why are we here?".

Holey trap – disordered proteins guard the gap

Prof Patrick Onck (RUG)

Co-applicants: Liesbeth Veenhoff (RUG), Cees Dekker (TUD), Rifka Vlijm (RUG)

The transport proteins in cells are highly selective, transporting only those molecules that have precisely the right shape: structure determines function. Until recently the nuclear pore complex, a large transport system to access the cell nucleus, was the only exception to this. Its selectivity for transport arises from a unique filter system based on unstructured proteins. Now, recently, a second filter system has been found (in peroxisomes) that works similarly but at a drastically reduced complexity. In this research programme we combine biological, physical and chemical methods to use this exciting opportunity to uncover how these filters system actually work.

How developing embryos use noisy clocks to tell time with high precision

Jeroen van Zon (AMOLF)

Co-applicants: Marianne Bauer (TUD); Alexander van Oudenaarden (Hubrecht); Rik Korswagen (Hubrecht); Jacques Bothma (Hubrecht); Marie-Anne Félix (CNRS)

During our embryonic development, each cell divides and differentiates at exactly the right time. However, how cells keep track of time is largely unknown, mostly because these processes are difficult to follow in most types of embryos. In this project, we will solve this fundamental question by studying the timing of cells in the simple nematode worm *C. elegans*, using novel biological techniques and theoretical concepts from physics. A better understanding of the mechanisms cells use to measure time will be crucial for applications in regenerative medicine and provide novel insight into the emergence of birth defects and other diseases.

Joining Forces for Human-Made Molecular Machines

Iddo Heller (VU)

Co-applicants: Ben Feringa (RUG); Jocelyne Vreede (UvA); Jan Lipfert (UU); Chase Broedersz (VU); Shirin Faraji (RUG)

In all forms of life, molecular motors are indispensable for transporting molecular building blocks inside cells, for maintaining DNA, and for generating (muscle-based) motion. Only recently, mankind has developed the ability to build synthetic molecular motors and machines and to control these with light. In this project, researchers from various disciplines will join forces to unravel the design-principles of synthetic nanomachines, to design motorized nanoscale building blocks and to demonstrate the first light-controlled artificial muscles and conveyor belts. These discoveries enable mankind to pursue new applications such as in nanomedicine and in the design of adaptive, mobile, and self-healing materials.

As stated in the call for proposals for these XL projects an external advisor will be appointed. He/she is an independent and experienced researcher from the relevant research field, for instance in the case of projects in the field of physics of life a member of a the research community committee POL is suitable. This members cannot be directly involved in the consortium. The advice aims at maximising the scientific and/or societal impact of the project. To this end, NWO expects the project leader and/or the consortium to contact the external advisor at least once a year.

Rubicon

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Breaking Barriers in Cardiac Regeneration: Harnessing Cardiac Stem Cell Mechanobiology and Hydrogel Building Blocks for Next-Generation Therapies

Dr. ir. D. Mostert (TU/e -> DWI-Leibniz-Institut für Interaktive Materialien (DE)).

This research aims to improve recovery after a heart attack by using advanced hydrogels and heart cells derived from stem cells. These hydrogels and cells work together to restore heart tissue structure, laying the groundwork for enhancing heart function and preventing heart failure.

Uncovering the universal mechanism to bacterial mutagenesis and antibiotic resistance

Dr. M. Tišma (TUD -> Harvard University (US))

Antibiotic resistance presents a rapidly growing public health crisis today. Bacteria evade the antibiotics by rapidly mutating and altering their DNA. This project will focus on understanding a central mechanism that promotes mutations necessary for antibiotic resistance. This research provides a key target for preventing bacteria to gain antibiotic resistance.

Bio sketches

This publication is a combined publication with the mini-profiles of the Tych lab blog: <https://www.ktsinglemolecule.com/blog>
Do you want to introduce yourself? Contact us via [email](#). We aim to put every newsletter two PIs in the spotlight.

Ivana Qianqi Lin (UT)



Job title: Assistant Professor, Department of Molecules and Materials, BRAINS & Molecules Center, MESA+ Institute

Subject area: Electrochemistry, Raman spectroscopy, in-situ rapid detection, brain-like devices

How did you get into science?

I was enlightened by my high school chemistry teacher, Dr Yong Wang, the first doctorate graduate to enter secondary education in my city. He inspired me with his logical thinking and kindness. I also enjoy the challenges that science offers.

Where else have you worked/studied? Studied and PhD in Chemistry at Oxford, Postdoc in Physics at Cambridge, and Raman Spectroscopy Scientist at the Rutherford Appleton Laboratory, collaborating closely with the WHO and Agilent Technologies. Internship at Schlumberger.

What are your hobbies/what do you do for fun? I like driving for road trips, and water sports such as snorkeling, kayaking, and swimming.

Could you share some tips and tricks for someone thinking about pursuing a career in science in academia? Doubt kills more dreams than failure. Believe in yourself, get on, work hard, and ask for help when you can.

Who are your scientific role models? My supervisors throughout my different roles, as well as my colleagues and collaborators who teach me something new every time we work or chat together.



Contact

Dr. Naomi Chrispijn-Steenbeek, secretary of the research community (committee) Physics of Life

NWO Utrecht, Winthontlaan 2, 3526 KV Utrecht

Do you have a news flash or research highlight interesting for the Dutch PoL community that you would like to add to the PoL newsletter? Send us an email.

Email: ResearchCommunity-PoL@nwo.nl

Website: nwobiophysics.nl/pol

T: +31 (0)70 349 4063

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