

Events & meetings

What	When	Where	More information
EMBL Conference: From 3D light to 3D electron microscopy	13-16 March 2022	Online	https://www.embl.org/about/info/course-and-conference-office/events/zei22-01/
NEMI Day	22 March	Naturalis Leiden	https://nemi.microscopie.nl/news/register-now-for-the-nemi-day-2021/
X-omics festival 2022	11 April	Online/Nijmegen	https://x-omics.nl/festival/online-festival-2022
NWO Life2022	24 and 25 May 2022	Hotel Zuiderduin, Egmond aan Zee	https://nwolife.nl/ Deadline abstract submission poster: 14 April
NWO CHAINS 2022	21 and 22 September 2022	Koningshof, Velhoven	https://nwochains.nl/
DutchBiophysics 2022	10 and 11 October 2022	Koningshof, Velhoven	https://www.nwo.nl/en/meetings/dutchbiophysics

New appointments, vacancies, grants, prizes, and other news.

- Dr. Nicholas Kurniawan and Dr. Rifka Vlijm have joined the Advisory committee Physics of Life.
- Call for Papers: Cell Reports Special issue: 3D chromatin organization¹.
 - Submission deadline: April 25, 2022
 - Guest editors: Dr. Effie Apostolou and Dr. Jop Kind
 - Journal editors: Dr. Tatyana Kuznetsova and Dr. Nikolay Tsanov
- NWA ORC Matchmaking 28 March 13:30 – 16:30: Building blocks, Origin, Quantum, Materials, Measurement, Personalised, Regenerative, Data²

¹ https://www.cell.com/cell-reports/special-issues/call-for-papers/3d-chromatin-organization?utm_campaign=STMJ_1645037061_CALLP_OA&utm_medium=SORG&utm_source=LI&dgcid=STMJ_1645037061_CALLP_OA

² <https://www.nwo.nl/en/meetings/orc-matchmaking-building-blocks-origin-quantum-materials-measurement-personalised>

- Postdoc vacancy at the group of dr. Nicholas Kurniawan on force transmissions in multicellular constructs and organoids³. Application deadline: 31 March 2022.
- PhD vacancy at the group of prof. dr. Gijsje Koenderink on Role of the cytoskeleton in cell membrane electroporation and cargo translocation⁴. Application deadline: 31 May 2022.

New colleagues

Steffen Werner (WUR)

In my work, I combine physics-inspired modeling and analysis in a tight feedback loop with biological experiments to not only gain understanding of biological phenomena but also to potentially reveal exciting, new physics.

Originally trained as a theoretical physicist, I joined the group of Frank Jülicher (MPI for the Physics of Complex Systems, Dresden, Germany) to pursue a PhD. Soon, I ended up spending half of my time in the lab of Jochen Rink (MPI for Cellular Biology and Genetics), where I was introduced to the fascinating world of planarian flatworms, true masters of regeneration. Even a tiny piece of the tail can remodel itself to recover a complete worm body of perfect proportions just smaller in size. What mechanism underlies this self-organized patterning and how does it scale with body size? How does macroscopic body size couple to microscopic cell behavior? To address these questions, we combined the analysis of RNAseq, growth and metabolic data with minimal models, for example expanding Alan Turing's work on self-organized chemical patterns to generate a self-scaling framework.



For my Postdoc, I went from flatworms to the roundworm *C. elegans* and topic-wise from morphogenesis to behavior. Together with my PIs Tom Shimizu (AMOLF, Amsterdam) and Greg Stephens (VU Amsterdam), I explored the origin of variability in behavior, for which these worms are ideal models due to their rigid body layout with an identical number of somatic cells. The work included the measurement of movement patterns, brain-activity with single-neuron resolution as well as gene expression. Again, the analysis was guided by using physics-inspired frameworks such as random-walk models and percolation theory on random geometric graphs.

In October 2020, I joined the Experimental Zoology group in Wageningen as a tenure-track assistant professor. My current work builds on both PhD and Postdoc projects with topics ranging from the stem cell dynamics in planarian regeneration to the emergence of brain activity during *C. elegans* development and to the trans-generational inheritance of memory. I am looking forward to many exciting interactions within the diverse Dutch Biophysics community.

³ <https://jobs.tue.nl/nl/vacature/2-postdocs-in-force-transmissions-in-multicellular-constructs-organoids-913122.html>

⁴ <https://www.academictransfer.com/nl/308475/phd-role-of-the-cytoskeleton-in-cell-membrane-electroporation-and-cargo-translocation/>.

Marianne Bauer (TUD)

In March 2022, I will join the Bionanoscience Department at TU Delft as a new theory PI. With my group, I will investigate noise, precision and efficiency in intra-nuclear processes, particularly gene regulation. Asking how far from “optimality” crucial molecular processes operate is interesting from a theoretical perspective, and hopefully has practical implications: comparison with statistical physics models in well-defined thermodynamic contexts can help us understand which and how components contribute to bringing noise down. I enjoy exploring these questions close to real systems. Currently, I am investigating optimal “measurement schemes” for a few crucial transcription factors in early fly embryo development, as a Fellow at the Center of the Physics of Biological Function at Princeton University, NJ. At Princeton, I have worked predominantly with Bill Bialek on the theoretical side, and Eric Wieschaus and Thomas Gregor’s group for an experimental collaboration; I’m also addressing the implications of phase separation in the nucleus with Ned Wingreen. At Delft, I want to address precision and efficiency also beyond the fly context, specifically in connection with synthetic cells, viruses and plants.



I moved to Princeton from Erwin Frey’s group at LMU Munich, where I investigated spatial structure in bacterial model populations as a Marie-Curie Fellow. My interest in biological systems started during my undergraduate in Chemistry and Mathematics at the University of St Andrews, UK. My graduate research in the Theory of Condensed Matter Group at Cambridge, UK, focused predominantly on Ultracold Gases (in low dimensions), and inspired my enjoyment of thermodynamics and simple statistical models; I also researched in protein folding as an MPhil student at the Chemistry Department at Cambridge.

I’m looking forward to starting my group at TU Delft in March, and am very excited to meet you all and to contribute to the biophysics community in the Netherlands!

Granted projects NWO

Veni⁵

Disposing of neurodegenerative diseases: A bivalent molecular approach to degrading intrinsically disordered proteins.

dr. P. Cossar (M), Technische Universiteit Eindhoven
Intrinsically disordered proteins (IDPs) cause neurodegenerative diseases, including Parkinson's and Alzheimer's. Currently, IDPs are considered to be 'undruggable', as drugs cannot stick to these highly flexible and disorganized proteins. This new approach captures the IDP within a protein cage and disposes of the IDP using the cells natural disposal system.

Understanding the molecular origin of collagen’s mechanical failure in osteogenesis imperfecta

dr. G. Giubertoni (V), Universiteit van Amsterdam

Osteogenesis imperfecta is a life-changing, occasionally lethal, disease caused by mutations in the genes encoding collagen, the main building block of all human connective tissues such as bones. I will investigate the molecular origin of this disease and identify the molecular properties determining the success or failure of collagen biomaterials.

⁵ <https://www.nwo.nl/en/researchprogrammes/nwo-talent-programme/projects-veni/veni-2021>

Dynamic changes in proteins during embryonic development

dr. S. Stelloo (V), Radboud Universiteit Nijmegen

During early embryogenesis, stem cells develop into various different cell types. The development of different cell types involves changes in both protein expression levels and protein-protein interactions. The researchers will investigate the dynamic changes in protein expression and interaction during the development of embryonic stem cells into more specialized cells.

“Macro”-managing genes

dr. I.K. Mandemaker (V), Hubrecht Institute

All cells in your body contain the same DNA but can specialize into different cell types by turning genes on or off. This is carefully organized by epigenetic processes to prevent disease. This research will show how a newly identified player controls gene activity by placing the biggest epigenetic mark.

Open Competition M⁶**Role of the cellular cytoskeleton in membrane electroporation and cargo translocation (ROCKET)**

Dr Pouyan Boukany & Prof. Gijsje Koenderink (TUD/TUD)

CRISPR-Cas is a revolutionary new technology which enables researchers to make fast, affordable and precisely targeted changes in the DNA of living cells. Congenital diseases can thus be treated at the source by repairing genes. Widespread application is however currently hampered by the fact that the CRISPR-Cas proteins need to be safely introduced into cells together with DNA or RNA, without cell damage. Here a multidisciplinary team of researchers will study how they can overcome the barrier posed by the cell membrane with electrical pulses, combining experiments and computer models.

⁶ <https://www.nwo.nl/en/news/seventeen-innovative-research-projects-launched-through-open-competition-domain-science-m-1>

NWO calls

Instrument	Deadline	Phase	Domain
Rubicon 2022-1	29-03-2022		
Vici 2022	12-04-2022	Pre-proposal	Science
Small projects for NWA routes 21/22	10-05-2022		NWA
Veni 2022	06-09-2022	Pre-proposal	Science

The full list can be found [here](#).

For questions, ideas, announcements, new appointments, grants, and other news items, please contact:

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NWO Advisory committee Physics of Life.

- Prof. John van Noort (chair; LEI)
- Dr. Kristina Ganzinger (AMOLF)
- Prof. Lukas Kapitein (UU)
- Dr. Nicholas Kurniawan (TU/e)
- Prof. Patrick Onck (RUG)
- Prof. Peter Peters (MU)
- Dr. Steven Petit (EMC)
- Dr. Greg Stephens (VU)
- Dr. Rifka Vlijm (RUG)