Programme

# Day 1: MONDAY 10 October

A Kleine Beneluxzaal
B Diezezaal
C Beneluxzaal
D Kempenzaal
E Brabantzaal
F Baroniezaal
G Room 52
H Room 55
I Room 58
1 Limburgfoyer

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|---|---|---|
| 09:00 | 09:55 | **Arrival \| Registration \| Coffee & tea @ Kempenzaal** D |
| 09:55 | 10:10 | **Official opening @ Brabantzaal** E |
| 10:10 | 10:40 | **Eleonora Secchi** (ETH Zurch)<br>What shapes bacterial biofilms? A soft matter perspective @ Brabantzaal E |
| 10:40 | 11:10 | **Anne Rios** (Princess Maxima Center for Pediatric Oncology)<br>Organoid cellular cancer immunity models in motion @ Brabantzaal E |
| 11:10 | 11:40 | **Morning break @ Kempenzaal** D |

## Parallel sessions

| | | Multicellular dynamics @ Brabantzaal E | Magnetic resonance @ Baroniezaal F | Antibiotics @ Diezezaal B | Membranes @ Kleine Beneluxzaal A |
|---|---|---|---|---|---|
| 11:40 | 11:55 | Generating active T1 transitions through mechanochemical feedback<br>**Silke Henkes** (LEI) | Multifaceted effects of small molecule inhibitors on the aggregation mechanism of Huntingtin Exon 1<br>**Greeshama Jain** (RUG; Patrick van der Wel) | Antibiotic mode of action: a real-time study of the molecular mechanism of teixobactin<br>**Sourav Maity** (RUG; Wouter Roos) | High macromolecular crowding in liposomes from microfluidics<br>**Andre Venancio Carvalho de Goes** (UU; Arnold Boersma) |
| 11:55 | 12:10 | Active hexanematics: a new paradigm for epithelial tissues<br>**Josep-Maria Armengol-Collado** (LEI; Luca Giomi) | A new perspective into the magnetism of ferritin<br>**Jacqueline Labra Muñoz** (LEI; Martina Huber) | The molecular mechanism of the lipopeptide-antibiotic Daptomycin<br>**Raj Kumar** (UU; Markus Weingarth) | Membrane fusion modifies the mechanical properties of membranes<br>**Rafael B. Lira** (RUG; Wouter Roos) |
| 12:10 | 12:25 | Collective dynamics of multicellular systems in curved geometries<br>**Tom Brandstätter** (LMU Munich; Chase Broedersz) | In vitro 1H MT and CEST MRI of milk protein breakdown in the stomach<br>**Morwarid Mayar** (WUR; Camilla Terenzi) | Lateral membrane organization identified as antimicrobial target<br>**Adéla Melcrová** (RUG; Wouter Roos) | Designing membrane curvature sensing antiviral peptides by evolutionary molecular dynamics (Evo-MD)<br>**Niek van Hilten** (LEI; Herre Jelger Risselada): |

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| 12:30 | 14:00 | **Lunch break**<br>**NVvM General Assembly followed by NEMI and NL-BI updates @ Baroniezaal** F<br>**Poster session (odd numbers) @ Kempenzaal** D |
| 14:00 | 14:30 | **Katharina Sonnen** (Hubrecht Institute)<br>Signaling dynamics in the control of embryonic development and tissue homeostasis @ Brabantzaal E |
| 14:30 | 15:00 | **Luca Giomi** (LEI)<br>Hydrodynamics and multiscale order in confluent epithelia @ Brabantzaal E |
| 15:00 | 15:30 | **Afternoon break @ Kempenzaal** D |

## Parallel sessions

| | | Chromatin remodeling @ Brabantzaal E | Sensing @ Baroniezaal F | Advanced microscopy @ Diezezaal B | Organ-physics @ Kleine Beneluxzaal A |
|---|---|---|---|---|---|
| 15:35 | 15:50 | How chromatin remodeling regulates transcriptional bursting<br>**Ineke Brouwer** (NKI; Tineke Lenstra) | Environmental tuning of stochastic gene expression modulates diversity of E. coli sensory phenotypes<br>**Fotios Avgidis** (AMOLF; Thomas Shimizu) | Ultrastructure and protein-entry dynamics revealed at the ciliary base using single-molecule imaging<br>**Aniruddha Mitra** (VU; Erwin Peterman) | Towards respiratory muscle-protective mechanical ventilation in the critically ill: technology to monitor and assist physiology<br>**Annemijn Jonkman** (EMC; BioPM Thesis award winner) |
| 15:50 | 16:05 | Nucleosome dynamics in folded chromatin fibers<br>**Jeremy Ernst** (LEI; John van Noort) | Mechanosensing modulates fibroblast phenotype transition<br>**Mirko D'Urso** (TU/e; Nicholas Kurniawan) | Zooming in: unravelling the role of peroxisomal contact sites using STED nanoscopy<br>**Eline de Lange** (RUG; Ida van der Klei and Rifka Vlijm) | Single-cell transcriptomics provides insights into heart disease<br>**Martijn Wehrens** (Hubrecht Institute; Eva van Rooij) |
| 16:05 | 16:20 | Archaeal chromatin is structurally modulated by DNA sequence, PTMs and environmental conditions<br>**Ilias Zarguit** (LEI; Remus Dame) | Computing the information transmission rate in complex systems<br>**Manuel Reinhardt** (AMOLF; Pieter Rein ten Wolde) | In situ cryo-lamella thickness quantification with a FIB-SEM integrated fluorescence microscope<br>**Radim Skoupy** (TUD; Arjen Jakobi) | Studying collagen mineralization in a bone-on-a-chip using live to cryo 3D CLEM<br>**Judith Schaart** (RUMC; Nico Sommerdijk) |
| 16:20 | 16:35 | Molecular mechanism for the nucleosome chaperone activity of transcriptional co-activator LEDGF/p75<br>**Willem Vanderlinden** (UU; Jan Lipfert) | Differentiated dynamic response in C. elegans chemosensory cilia<br>**Christine Bruggeman** (VU; Erwin Peterman) | PTX3 structure determination using a hybrid cryoEM and AlphaFold approach<br>**Dylan Paul Noone** (LUMC; Thomas Sharp) | Tracking organoid cell fates in space and time<br>**Xuan Zheng** (AMOLF; Sander Tans and Jeroen van Zon) |

## Interactive sessions

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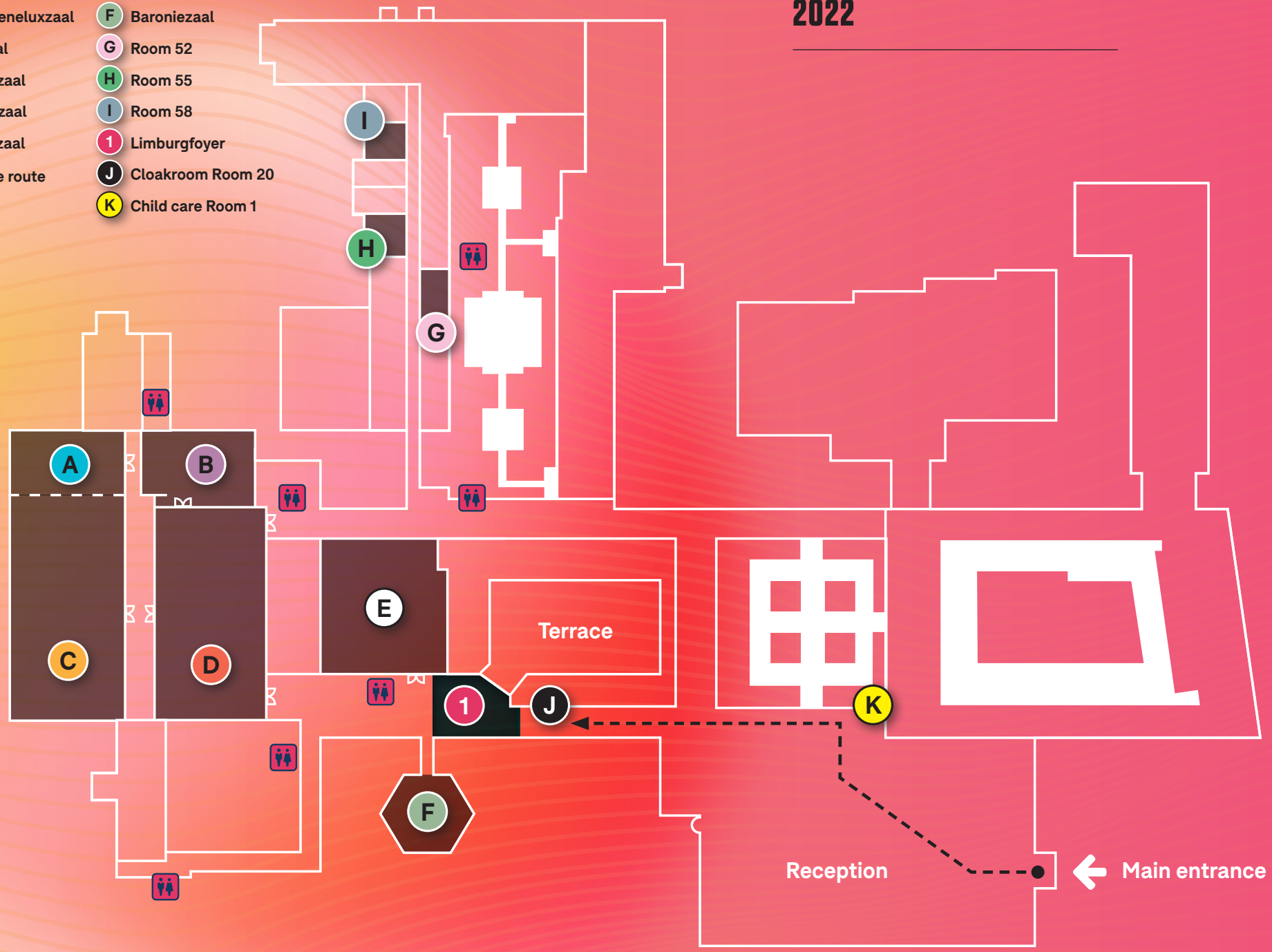
| 16:45 | 17:45 | For research staff: Open Forum Physics of Life @ Baroniezaal E<br>*Masterclass Eleonora Secchi @ Room 52 (For junior researchers) G<br>*Masterclass Gaia Pigino @ Room 55 (For junior researchers) H<br>*Masterclass Anne Rios @ Room 58 (For junior researchers) I<br>*Workshop Scientific Storytelling @ Kleine Beneluxzaal (For junior researchers) A<br>*Workshop Plan ahead: practical tools to make your data and software more FAIR @ Diezezaal (For junior researchers) B<br>Workshop career opportunities outside of academia @ Brabantzaal E |
| 18:00 | 19:25 | **Diner @ Beneluxzaal** C |
| 19:35 | 19:45 | **Award ceremony BioPM Thesis award @ Brabantzaal** E |
| 19:45 | 20:30 | **Hans Clevers** (Roche Pharma Research and Early Development)<br>Stem cell-based organoids in human disease @ Brabantzaal Keynote lecture E |
| 20:30 | 00:00 | **Evening programme @ Baroniezaal & Limburgfoyer** F 1 |

**Only open to selected participants*

# FLOOR PLAN

- A Kleine Beneluxzaal
- B Diezezaal
- C Beneluxzaal
- D Kempenzaal
- E Brabantzaal
- Entrance route
- Toilets
- F Baroniezaal
- G Room 52
- H Room 55
- I Room 58
- 1 Limburgfoyer
- J Cloakroom Room 20
- K Child care Room 1




Welcome to
# NWO BIOPHYSICS 2022

NWO Biophysics is the annual Dutch conference on physics of life. The conference presents an exciting programme covering a broad range of scientific topics varying from microscopy and cell biology to biomedical engineering. It is the very heart of Dutch research groups in these fields of expertise, creating a place to explore, push boundaries and celebrate interdisciplinary science together. Organised by NWO in collaboration with NVvM, BioPM, and DSCB.

Make sure to vote for your favourite poster before Tuesday 11 October | 14:10. The poster with the most votes wins the NVvM audience award.

Looking forward to connect and discuss ambitions with others in the field? Or would you like to start public private collaborations between academia and industry? Join the Teaming up with industry session: Tuesday 11 October | 11:35 - 12:35 | Kleine Beneluxzaal.
*Scan the QR-code*

Calling all Dutch Biophysicists! Unite yourselves in the Physics of Life Research Community and meet your peers during the Open forum Physics of Life. Would you like to know more about becoming a member of the Physics of Life Research Community?
Open Forum Physics of Life
Monday 10 October | 16:45 - 17:45 | Baroniezaal.
*Scan the QR-code*

If you have any questions or remarks, please visit the registration desk or contact us via biophysics@nwo.nl, or tweet to @NWO_science using #NWOBiophysics2022

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Programme

# Day 2: TUESDAY 11 October

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|---|---|---|
| 09:00 | 09:30 | **Gaia Pigino (Human Technopole)** Structural cell biology of cilia @ Brabantzaal (E) |
| 09:30 | 10:00 | **Richard Scheltema (UU)** Survival strategies in the heat – Lysine acetylation stabilizes the quaternary structure of a Mega-Dalton hyperthermophilic PEP-synthase @ Brabantzaal (E) |
| 10:00 | 10:30 | **Morning break @ Kempenzaal** (D) |

## Parallel sessions

| | | **Developments in imaging @ Brabantzaal (E)** | **DNA/RNA: structure and dynamics @ Baroniezaal (F)** | **Phase-separation @ Diezezaal (B)** | **Engineering @ Kleine Beneluxzaal (A)** |
|---|---|---|---|---|---|
| 10:30 | 10:45 | Automated 3D cell tracking with robust error control **Max Betjes** (AMOLF; Jeroen van Zon) | Data-driven theory for chromosome organization during replication **Janni Harju** (VU; Chase Broedersz) | Approximating the nucleoli with proteins and RNA: shaping condensate dynamics with ATP:Mg2+ **N. Amy Yewdall** (RU; Evan Spruijt) | Trapped reentry as a dormant source of arrhythmia **Tim de Coster** (LUMC; Daniel Pijnappels) |
| 10:45 | 11:00 | Automation for STED microscopy **Frank Mol** (RUG; Rifka Vlijm) | Viral double-stranded RNA recognition and degradation by MDA5 from a single molecule perspective **Salina Quack** (VU; David Dulin) | Surfactant-free minimal droplet-based system for study of emergent behaviour **Niels Appelman** (WUR; Siddharth Deshpande) | A photoresponsive hydrogel to investigate cell responses to dynamically changing topographies **Maaike Bril** (TU/e; Nicholas Kurniawan) |
| 11:00 | 11:15 | Developing an optimized toolbox for motor-PAINT **Malina Iwanski** (UU; Lukas Kapitein) | DNA supercoiling restricts the transcriptional bursting of neighboring eukaryotic genes **Heta Patel** (NKI; Tineke Lenstra) | Complementary or competing Interactions in ALS progression? A study of FUS-DPR-RNA condensates **Mark Driver** (RUG; Patrick Onck) | Dengue virus alters mosquito biting behavior to enhance transmission **Felix Hol** (RUMC) |
| 11:15 | 11:30 | DyeCycling breaks the photobleaching limit in single-molecule FRET **Benjamin Vermeer** (WUR; Sonja Schmid) | Nucleotide binding halts diffusion of the eukaryotic replicative helicase during activation **Daniel Ramirez Montero** (TUD; Nynke Dekker) | Antibody binding modulates the dynamics of the prion protein **Ioana Ilie** (UvA) | Quantitative Acoustophoresis: mechanical characterization of bioparticles with a contact-free assay **Vadim Bogatyr** (VU; Gijs Wuite) |

## Interactive sessions

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|---|---|---|
| 11:35 | 12:35 | For research staff: Teaming up with Industry @ Kleine Beneluxzaal (A) |
| | | *Masterclass Katharina Sonnen @ Baroniezaal (For junior researchers) (F) |
| | | *Workshop David Fernandez Rivas @ Room 52 (For junior researchers) (G) |
| | | *Masterclass Richard Scheltema @ Room 55 (For junior researchers) (H) |
| | | *Masterclass Anna Akhmanova @ Room 58 (For junior researchers) (I) |
| | | *Masterclass Luca Giomi @ Diezezaal (For junior researchers) (B) |
| | | Info session Research funding in the Netherlands @ Brabantzaal (E) |

**Only open to selected participants*

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| 12:40 | 14:10 | **Lunch break** (D)<br>**Poster session (even numbers) @ Kempenzaal**<br>**Workshop Towards a more inclusive research community (13:00 - 14:00) @ Kleine Beneluxzaal** (A) |

## Parallel sessions

| | | **Cytoskeleton @ Brabantzaal (E)** | **Biopolymers @ Baroniezaal (F)** | **Nanotechnology @ Diezezaal (B)** | **Photosynthesis and prokaryotic cell population dynamics @ Kleine Beneluxzaal (A)** |
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| 14:15 | 14:30 | Constriction of actin rings by passive crosslinkers **Alexander Cumberworth** (AMOLF; Pieter Rein ten Wolde) | Hydrogen-bonds under strain **Giulia Giubertoni** (UvA; Sander Woutersen) | Artificial biomimetic platforms for studying the transport through the NPC **Eva Bertosin** (TUD; Cees Dekker) | Dynamics of cyanobacterial colonies under turbulent shear flows **Yuri Sinzato** (UvA; Maziyar Jalaal) |
| 14:30 | 14:45 | Dynamic instability of force-generating bacterial microtubules **Reza Amini Hounejani** (TUD; Marileen Dogterom) | Elucidating the molecular mechanisms of protein aggregation in C. elegans as a living model system **Tessa Sinnige** (UU) | Prolonged single-molecule trapping by the NEOtrap for small proteins and protein dynamics detection **Chenyu Wen** (WUR; Sonja Schmid) | The energy transfer pathways between light-harvesting complexes in a Photosystem II assembly **Eduard Elias** (VU; Roberta Croce) |
| 14:45 | 15:00 | STED nanoscopy reveals how assembly and constriction of ESCRT-III polymers aid archeal cell division **Thomas Burgers** (RUG; Rifka Vlijm) | Extracting curvilinear structures from large 3D microscopy datasets **Eugene Katrukha** (UU; Lukas Kapitein) | DNA nanotechnology to activate the complement system via nanopatterning antibodies **Leoni Abendstein** (LUMC; Thomas Sharp) | Asymptotic decoupling of cell size distribution and population growth rate **Yaïr Hein** (UU; Farshid Jafarpour) |
| 15:00 | 15:15 | Anillin as a microtubule-actin crosslinker **Ilina Bareja** (TUD; Marileen Dogterom) | Circuit topology of cellular genome reveals conformational motifs, heterogeneity, and scaling **Barbara Scalvini** (LEI; Alireza Mashaghi) | Nanopore-powered DNA turbines **Xin Shi** (TUD; Cees Dekker) | The role of LHCI in excitation-energy transfer from LHCII to photosystem I in Arabidopsis **Christo Schiphorst** (WUR; Emilie Wientjes) |

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| 15:25 | 16:10 | **Manu Prakash** (Stanford University)<br>That sinking feeling: Gravity and its role in how life navigates the oceans @ Brabantzaal (E) |
| 16:10 | 16:25 | **Poster prizes & Closing remarks** (E) |