

NWO
PHYSICS

Programme

FUTURE

23 & 24 January 2024
NH Koningshof
Veldhoven



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Programme **Tuesday 23 January**

09.00	– 10.00	Registration (Limburgfoyer)
10.00	– 10.10	Opening ceremony (Beneluxzaal)
10.10	– 10.55	Plenary lecture: Sara Bals (Beneluxzaal)
10.55	– 11.15	Break (Kempenzaal)
11.15	– 12.55	Focus sessions (page 6 & 7)
12.55	– 13.55	Lunch (Kempenzaal)
13.55	– 15.05	Poster session odd numbers (Kempenzaal) & workshops (page 5)
15.05	– 16.20	Parallel sessions (page 8 & 9)
16.20	– 16.50	Break (Kempenzaal)
16.50	– 17.50	Parallel sessions (page 10 & 11)
17.50	– 18.20	Break (Kempenzaal)
18.20	– 19.50	Dinner (Beneluxzaal)
19.50	– 20.25	Award ceremony (Beneluxzaal)
20.25	– 21.10	Plenary lecture: Cristophe Clanet (Beneluxzaal)
21.10	– 00.30	Festive evening (Brabantzaal & Baroniezaal)

Featured Plenary lectures



10.05 – 10.55 Beneluxzaal

Sara Bals

University of Antwerp

New developments in transmission electron microscopy for 2D and 3D investigations of beam sensitive materials



20.25 – 21.10 Beneluxzaal

Cristophe Clanet

The French National Centre for Scientific Research & École Polytechnique

Track cycling Physics - why is the Netherlands so strong?

Additional activities



12.55 – 13.55 Parkzaal

Community Lunch

NWO research community 'Physics for Technology and instrumentation' invites you to connect with your community over lunch



13.40 – 14.00 Meijerijfoyer

Pitch podium

Listen to some poster pitches while enjoying your lunch

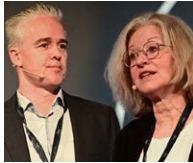


13.10 – 14.00 Limburgfoyer

Woodland walk

Bring your lunch outside and join the forester for a tour around the wooded area of the NH Koningshof

Featured Workshops



13.55 – 14.55 Baroniezaal

Ivo van Vulpen & Margriet van der Heijden

Future-proof Science
Communication
(invited participants only)

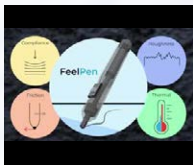


13.55 – 14.55 Brabantzaal

Vera Meester

Get inspired for your future career

Demonstrations



Kempenzaal

Experience the future
of tactile interaction with
FeelPen and FeelSurf

Festive evening



21.10 – 22.30 Baroniezaal

Open Stage: Physics got talent!



22.30 – 23.00 Baroniezaal

Pub quiz hosted by Remko Achten



21.10 – 00.30 Brabantzaal

DJ Mike: Blast from the past!

Focus sessions 11.15 – 12.55

Baroniezaal



*The Droplet Microbiota:
physics of microorganisms
inside droplets*

Chairs

Alvaro Marin [UT]
Maziyar Jalaal [UvA]

Hanneke Gelderblom [TU/e]
Active bacterial pattern
formation inside evaporating
droplets

Daniel Bonn [UvA]
(Corona-) Virus transmission
through respiratory aerosol
droplets

Sander Herfst [ErasmusMC]
Respiratory virus transmission

**Johan Leveau
[University of California]**
Life in the phyllorella: microbial
colonization of the plant leaf
surface waterscape

Auditorium



*Recent trends in 2D
superconductivity and
magnetism*

Chair

Jan Aarts [LEI]

Justin Ye [RUG]
Field-Effect Control of Clean
Superconductivity and
Unconventional FFLO States in
2D Materials

Peter Liljeroth [Aalto University]
Visualizing designer electronic
states in van der Waals
heterostructures

Kaveh Lahabi [LEI]
The unusual nature of
spin-triplet supercurrents in
spin-textured Josephson
junctions

Mazhar Ali [TUD]
Superconductivity in 2D
Quantum Material Josephson
Junctions

Room 82-83



*In situ transmission electron
microscopy for material
science*

Chair

Wiebke Albrecht [AMOLF]

Ulrich Lorenz [EPFL]
Observing Nanoscale Dynamics
with Time-Resolved Electron
Microscopy

Marijn van Huis [UU]
Growth of 2D Materials and
Nanoscale Potentials in Liquid
Studied by In Situ TEM

Dan Zhou [DENSsolutions B.V]
In Situ Gas Phase TEM: from Dry
to Humid Gas Environment

Erik Garnett [AMOLF]
In situ transmission electron
microscopy for material science
panel discussion

Room 63-64



*Freeform gradient-index
optics: exciting new
components to steer light!*

Chair

Martijn Anthonissen [TU/e]

**Greg Schmidt
[University of Rochester]**
Freeform Gradient Index Optics

Antonio Barion [TU/e]
Hamilton-Lie aberrations of
GRIN lenses

**Andrew Boyd
[Excelitas Technologies]**
Exploring the Solution Space of
Simple Generalised GRIN
Lenses

Melissa Goodwin [UT]
Fabrication of nanophotonic
structures in silicon

Boszaal



*A particle physics guide
towards quantum
gravity*

Chair

Frank Saueressig [RU]

**Astrid Eichhorn
[University of Southern
Denmark]**
Testing quantum gravity at all
scales

**Antonio Pereira
[RU/Fluminense Federal
University]**
Navigating across scales:
Functional Renormalization and
Asymptotically Safe Quantum
Gravity

Juan Rojo [VU/Nikhef]
An Effective Theory Pathway to
the New Standard Model

Lydia Brenner [Nikhef]
How the standard model
effective field theory can be
tested in collider experiments

Focus sessions 11.15 – 12.55

Room 80-81



Reshaping Colloidal Gels to create Novel Sustainable Materials

Chairs

Joost de Graaf [UU]
Valeria Garbin [TUD]

George Petekidis
[IESL-FORTH]

Controlling the structure and mechanical properties of colloidal gels by shear history

Erin Koos [KU Leuven]

Lubrication effect of nanoparticles in capillary suspensions and their implications for applications

Berend van der Meer [WUR]

Towards frictional tuning of interparticle bonds in attractive colloidal matter

Krassimir Velikov
[Unilever/UvA]

Cellulose microfibril networks: Properties and application in designer complex fluids and soft mater

Parkzaal



Evolution of X-ray techniques for nanostructures from incoherent scattering to coherent imaging

Chairs

Igor Makhotkin [UT]
Guiseppa Portale [RUG]

Christian Schroer [DESY]

Coherent X-ray microscopy for quantitative imaging and the metrology of X-ray optics

Giuseppe Portale [RUG]

In-situ and depth-resolved gracing incidence X-ray scattering of perovskite materials

Laura Rossi [TUD]

Self-assembly of anisotropic and magnetic colloids in evaporating droplets

Detlef Beckers

[Malvern Panalytical B.V.]
X-ray laboratory instrumen-
tation for nano materials
characterization

Brabantzaal



Controlling light, charge and spin in dynamical materials: theory and design

Chair

Shuxia Tao [TU/e]

Linn Leppert [UT]

First-principles-aided cartography of excitons in metal-halide perovskites

Jagoda Slawinska [RUG]

Spin selectivity in chiral materials

Adriana Pietropaolo

[University of Catanzaro]
Simulation workflows of chiral polymers and low-dimensional perovskites

Bjorn Baumeier [TU/e]

Theoretical Spectroscopy of Complex Multiscale Materials with Embedded Green's Function Methods

Room 55-58



Exploring Approaches to Quantum Physics Education: Fostering Diversity in Students and Researchers

Chairs

Alexander Brinkman [UT]
Miriam Blaauboer [TUD]

Judith Gabel [LMU Munich]
Quantum LifeLong Learning

Oliver Passon [Bergische Universität Wuppertal]
Philosophy of quantum mechanics in the classroom

Kirsten Stadermann [UT]

Quantum Physics Can Teach High School Students How Science Works

Room 65



Plasmas for Sustainability

Chairs

Gerard van Rooij [UM]
Richard van de Sanden [DIFFER]

Margherita Altin [UM]

Non-equilibrium NOx production in a thermal plasma unraveled by experiments and modelling

Dirk van den Bekerom [TNO]

Towards a circular chemical industry: Scaling up plasma technology from lab- to industrial scale

David Graves

[Princeton University]
Air plasma for nitrogen fixation: energy efficiency and plasma-surface interactions

Jannis Teunissen [CWI]

Understanding electric discharges in sustainable alternatives for SF6

Parallel sessions 15.05 – 16.20

Room 82-83



Astroparticle physics, gravitation, and cosmology I

Chair

Tina Pollmann [UvA]

15.05 **Alex Amato [UM]**

High-Quality mirrors for future Gravitational-Wave Detectors

15.20 **Quirijn Meijer [UU]**

Gravitational-Wave Searches for Cosmic String Cusps in Einstein Telescope Data using Deep Learning

15.35 **Melissa Lopez [UU]**

Ameliorating transient noise bursts in gravitational-wave searches for intermediate-mass black holes

15.50 **Teresa Bister [RU]**

Tracing cosmic structures through ultra-high-energy cosmic ray data

16.05 **Pieter Braat [Nikhef]**

BBN constraints on resonant DM annihilations

Boszaal



Atomic, Molecular and Optical Physics I

Chair

Sven Askes [VU]

15.05 **Victor van Lange [TU/e]**

Light emission from hex-SiGe quantum wells

15.20 **Djero Peeters [TU/e]**

Direct Measurement of the THz Local Density of Optical States of Metasurfaces

15.35 **Serhii Volosheniuk [TUD]**

Single molecule heat engine

15.50 **Yuly Andrea Chamorro Mena [RUG]**

Parity violation in diatomic molecular ions

16.05 **Anne van Klinken [TU/e]**

Picometer-level precision with low spectral resolution: Multispectral readout exceeds spectrometers

Room 55-58



Materials Physics I

Chair

Semonti Bhattacharyya [LEI]

15.05 **Oleksandr Zheliuk [RU]**

Quantum Hall effect in two-dimensional electron gas of Bi₂O₂Se

15.20 **Sergio Barquero [UvA]**

Magnetism meets topology: electronic structure of candidate FM-TI MnSb₂Te₄ by ARPES

15.35 **Rian Ligthart [UU]**

Topological states created atom-by-atom with Cs on InAs(111)A

15.50 **Jelle Lorenz [UvA]**

Uniaxial strain effects on the Fermi surface of the Dirac nodal-line semimetal ZrSiS

16.05 **Karma Tenzin [RUG]**

Collinear Rashba-Edelstein effect in chiral crystals

Room 63-64



Nanoscale Physics I

Chairs

Jaco Geuchies
[Max Planck Institute]

15.05 **Nelson de Gaay Fortman [AMOLF/UvA]**

Spontaneous symmetry breaking in plasmon lattice lasers

15.20 **Mohammadreza Aghdaee [UT]**

Spectral signatures of enhanced scattering of a nanoscale object in plasmonic nanocavities

15.35 **Saskia Fiedler [AMOLF]**

Pump-probe cathodoluminescence spectroscopy of silicon nanoparticles

15.50 **Mees Dieperink [AMOLF]**

Electromagnetic Simulations for Correlative Studies on Metallic Nanoparticles

16.05 **Jacco Ton [LEI]**

Trapping d=30 nm brownian plastic using nano-gap-based dielectrophoresis and scattering detection

Room 80-81



Physics of Fluids I

Chair

Tim Segers [UT]

15.05 **Claire Claassen [TU/e]**

Resolving the heat transfer at particle-particle contact points on Cartesian grids with IBM

15.20 **Vincent Siekman [UT]**

Understanding the growth dynamics of capillary bridges for enhanced grease lubrication

15.35 **Rozeline Wijnhorst [UvA]**

Ions in motion: Salt efflorescence on cone shaped porous media

15.50 **Muhammad Ahmed Hanif [UT]**

Effect of hopper angle and particle shape on granular discharge rate

16.05 **Ali Fathiganjehlou [TU/e]**

MRI for the Characterization of Local Particle Wetting inside a Slender Trickle Bed Reactor

Parallel sessions 15.05 – 16.20

Room 65

K

Plasma & Fusion Physics I

Chair

Roland Bliem [ARCNL]

15.05 Paul Mulholland [TU/e]

Turbulence limiting fusion reactor efficiency in high-performance operation

15.20 Jorge Gonzalez [ARCNL]

Simulations of the generation of EUV light from thin tin disks exposed to a CO₂ laser

15.35 Fabio Romano [DIFFER]

Studying the physics of the lithium vapour box in the linear plasma generator Magnum-PSI

15.50 Tim Donders [TU/e]

Laser-induced photo-detachment as a diagnostic for dust particle size in a nanodusty plasma

16.05 Dennis Bouwman [CWI]

Approximating single streamer discharges in air with an axial model

Parkzaal

L

Quantum Physics I

Chair

Wolfgang Löffler [LEI]

15.05 Hanifa Tidjani [TUD]

Qubits on the move: fast, high-fidelity, baseband quantum gates

15.20 Madhav Mohan [TU/e]

Robust control and optimal Rydberg states for neutral atom two-qubit gates

15.35 Maxim De Smet [TUD]

Coherent electron spin shuttling in silicon quantum dots

15.50 Jurgen Dijkema [TUD]

Two-qubit logic between distant spins in silicon

16.05 Clinton Potts [TUD]

A Superconducting Single-Atom Phonon Laser

Auditorium

M

Quantum Physics II

Chair

Chuan Li [UT]

15.05 Davide Pizzirani [RU]

Exploring the tunability of the electronic properties of ZrSiSe

15.20 Lucas Maisel Licerán [UU]

Topology of bismuth selenide nanosheets

15.35 Thies Jansen [UT]

Transport Study on micro sized flakes of the intrinsic magnetic topological insulator MnBi₂Te₄

15.50 Thom Ottenbros [RU]

Exploring and Tuning Magnetic Order in Rare-Earth Trifluorides

16.05 Jiasen Niu [LEI]

Why shot noise does not generally detect pairing in mesoscopic superconducting tunnel junctions

Brabantzaal

F

Statistical Physics & Soft condensed matter I

Chair

Tom Kodger [WUR]

15.05 Elham Mirzahassein [UvA]

Probing the Dynamics of Drying Polymer Solution Droplets using Molecular Rotors

15.20 Christopher Hosier [Unilever Foods Innovation Centre]

Properties of Iron Oxide Materials Modified with Organic Diacids

15.35 Maarten Boomstra [TU/e]

Wax-graphene nanocomposites for heat storage: a molecular dynamics study

15.50 Laura van Hazendonk [TU/e]

Characterization of polydisperse graphene nanoplatelet dispersions via X-ray scattering and rheology

16.05 Yu-Fan Lee [TUD]

Local ordering of colloidal gels driven by ultrasound-activated bubbles

Baroniezaal

D

Statistical Physics & Soft condensed matter II

Chair

Hanumantha Rao Vutukuri [UT]

15.05 Marjolein de Jager [UU]

Compaction of HIV DNA: an exploration of the self-assembly pathway

15.20 Janni Harju [VU]

Loop-extruders alter bacterial chromosome topology to direct entropic forces for segregation

15.35 Manuel Reinhardt [AMOLF]

An Exact Algorithm for Computing the Information Transmission Rate in Stochastic Systems

15.50 Tim Kamsma [UU]

Brain-like computing in a brain-like medium: towards aqueous neuromorphic iontronics

16.05 Tom Brandstätter [VU]

Data-driven theory reveals universal cell-cell interactions across distinct motile cells

Parallel sessions 16.50 – 17.50

10 Parallel sessions 16.50 – 17.50 Tuesday 23 January

Room 82-83



*Astroparticle physics,
gravitation, and cosmology II*

Chair

Tina Pollmann [UvA]

16.50 **Thomas Bakx [UU]**

Perturbation Theory
Perspectives on Intrinsic
Alignments: Past, Current
and Future

17.05 **Marta Borchellini [RUG]**

The role of electron capture
decay in the precision era of
Galactic cosmic-ray data

17.20 **Maximilian Becker [RU]**

Composite Operators in
Asymptotically Safe Quantum
Gravity

17.35 **Viktor Könye [UvA]**

Anisotropic optics and
gravitational lensing of tilted
Weyl fermions

Boszaal



*Atomic, Molecular and
Optical Physics II*

Chair

Sven Askes [VU]

16.50 **Itir Bakis Dogru Yuksel [UU]**

Label free optical imaging of
electrochemical reactions
and ion accumulation around
nanosctructure

17.05 **David Picconi [RUG]**

Implementation of various
quantum-classical methods
for nonadiabatic molecular
dynamics in PySurf

17.20 **Kim Steenbakkens [RU]**

Leak-out spectroscopy as
alternative method to rare-gas
tagging for Renner-Teller
perturbed ions

17.35 **Jasper van de Kraats**

[TU/e]

Resonance triplet dynamics in
the quenched unitary Bose gas

Room 55-58



Materials Physics II

Chair

Semonti Bhattacharyya [LEI]

16.50 **Huygen Jöbsis [UU]**

Spin-polarized charge carrier
dynamics in Cs₂AgBiBr₆ thin
film

17.05 **Thomas Blank [RU]**

Nonlinearities in THz dynamics
of lattice and spins

17.20 **Maarten Kwaaitaal [RU]**

Switching ferroelectric
polarization with far-infrared
laser pulses

17.35 **Falk Pabst [UvA]**

Unconventional Magnetic
Behavior in the Rare Earth
Iron Antimonides RE₃Fe₃Sb₇
(RE = Pr, Nd, Sm)

Room 63-64



Nanoscale Physics II

Chair

Jaco Geuchies
[Max Planck Institute]

16.50 **Ksenia Matveevskii [UT]**

Characterization of nano-
gratings by using 3D X-ray
Standing Wave technique

17.05 **Ludovica Guarneri [UvA]**

Temperature-dependent
Exciton Light Scattering in
Atomically-Thin Metasurfaces

17.20 **Abel Brokkelkamp [TUD]**

Localized Exciton Anatomy and
Band Gap Energy Modulation
in One-Dimensional MoS₂
Nanostructures

17.35 **Jort Verbakel [UT]**

Photoconductive Atomic Force
Microscopy on 2D materials

Room 80-81



Physics of Fluids II

Chair

Tim Segers [UT]

16.50 **Cem Bingol [TU/e]**

Effects of oscillatory forcing on
gravity currents: front position
and mixing

17.05 **Ziqi Wang [TU/e]**

How the growth of lake ice
depends on the fluid dynamics
underneath

17.20 **Timothy Chan [UT]**

Point-particle Simulations of
Bubble-particle Collisions
in Turbulence

17.35 **Xander de Wit [TU/e]**

Pattern formation by turbulent
cascades: the case of odd
viscosity

Parallel sessions 16.50 – 17.50

Room 65

K

*Plasma & Fusion Physics II +
Physics for Technology I*

Chair

Roland Bliem [ARCNL]

16.50 Yihao Guo [TU/e]
Characterizing streamer
discharges in N₂/O₂/CO₂
mixtures by 3D reconstruction

17.05 Rik Peelen [TU/e]
Measuring electron density:
microwave interferometry vs.
Langmuir probe in small,
low-density plasma

17.20 Mark Hulsbos [TU/e]
The Heat Flux Method for hybrid
iron-methane-air flames

17.35 Richard Benders [WUR]
Lubricating the flow of powder
mixtures in high pressure
extrusion conditions

Parkzaal

L

Quantum Physics III

Chair

Wolfgang Löffler [LEI]

16.50 Robert de Keijzer [TU/e]
Variational method for learning
Quantum Channels via
Stinespring Dilation on neutral
atom systems

17.05 Nicolas Demetriadou [TUD]
A robust quantum memory for
quantum networks

17.20 Nina Codreanu [TUD]
Quantum network nodes based
on all-diamond photonic
nanostructures

17.35 Kirsten Kannevorf [LEI]
Photon bunching for quantum
position verification measured
with four detectors.

Auditorium

M

Quantum Physics IV

Chair

Chuan Li [UT]

**16.50 Steven de Rooij
[SRON/TUD]**
Evidence for quasiparticle
trapping in disordered
superconductors from
fluctuation measurements

17.05 Alexander Korsch [TUD]
Optomechanical crystals in
superfluid thin-film helium

17.20 Anouar Moustaj [UU]
Isospectral Reductions of
non-Hermitian Hamiltonians

**17.35 Seenivasan Hariharan
[UvA]**
New insights into photo-
oxidation of H₂O on TiO₂ dimers
using quantum algorithms

Brabantzaal

F

*Statistical Physics & Soft
condensed matter III*

Chair

Tom Kodger [WUR]

16.50 Chandan Shakya [UvA]
Relaxation in packings of
deformable particles

17.05 Julio Melio [LEI]
Towards colloidal microrobots:
Designing and understanding
floppy colloidal structures

17.20 Lishuai Jin [AMOLF]
SnapGami: frustrated sheets
with controllable pathways

17.35 Jack Binysh [UvA]
Coarsening in odd elastic
metamaterials

Baroniezaal

D

*Statistical Physics & Soft
condensed matter IV*

Chair

Hanumantha Rao Vutukuri [UT]

16.50 Stijn van der Ham [UT]
Role of shape in particle-lipid
membrane interactions: from
surfing to full engulfment

17.05 Stefanie Pritzl [UU]
Magnetic Tweezers for
Multiplexed Single Protein
Force Spectroscopy

**17.20 Josep-Maria Armengol
[LEI]**
Modelling cancer metastasis
with active nematics

17.35 Nico Schramma [UvA]
Form Follows Function -
Morphodynamics in
single-celled Algae

Programme **Wednesday 24 Januari**

09.00 – 10.15 **Parallel sessions (page 14 & 15)**

10.15 – 10.45 Break (Kempenzaal)

10.45 – 12.00 **Parallel sessions (page 16 & 17)**

12.00 – 13.00 Lunch (Kempenzaal)

13.00 – 14.10 Poster session even numbers (Kempenzaal) / workshops (page 13)

14.10 – 15.50 **Focus sessions (page 18 & 19)**

15.50 – 16.10 Break (Kempenzaal)

16.10 – 17.00 **Plenary lecture: Freya Blekman (Beneluxzaal)**

17.00 – 17.15 Poster award ceremony and closing (Beneluxzaal)

Featured Plenary lecture



16.10 – 17.00 Beneluxzaal

Freya Blekman

DESY & University of Hamburg

Do we even need another collider now an SM scalar boson has been discovered?

Workshops



13.00 – 14.00 Baroniezaal

Ivo van Vulpen & Margriet van der Heijden

Future-proof Science Communication
(invited participants only)



13.00 – 14.00 Brabantzaal

Davide Iannuzzi

How to start a start-up?

Additional activities



12.45 – 13.05 Meijerijfoyer

Pitch podium

Listen to some poster pitches while enjoying your lunch



12.15 – 12.45 Limburgfoyer

Woodland walk

Bring your lunch outside and join the forester for a tour around the wooded area of the NH Koningshof

Parallel sessions 09.00 – 10.15

14 Parallel sessions 09.00 – 10.15 Wednesday 24 January

Room 82-83

N

Astroparticle physics, gravitation, and cosmology III

Chair

Subodh Patil [LEI]

09.00 **Gastón Creci [UU]**

Tidal properties of neutron stars in scalar-tensor theories of gravity

09.15 **Sofia Canevarolo [UU]**

Gravitational lensing of standard sirens: a systematic effect on cosmological parameters estimation

09.30 **Maxime Pierre [UvA]**

Latest results from the XENONnT experiment

09.45 **Jonathan Perry [VU]**

Modelling control systems with non-linear couplings in gravitational wave detectors

10.00 **Vikas Gupta [Nikhef]**

Studying neutrinos with DUNE

Boszaal

I

Atomic, Molecular and Optical Physics III

Chair

Lukas Pasteka [RUG]

09.00 **Marten Luit Reitsma [RUG]**

Hyperfine structure calculations of excited states of lawrencium using Fock-space coupled cluster

09.15 **Andres Martinez de Velasco [VU]**

Laser excitation of the 1S-2S transition of singly-ionized helium

09.30 **Jelle Lagerweij [TUD]**

Multiscale Modeling of Transport Properties of KOH (aq) with Machine Learning

09.45 **Giel Keijsers [AMOLF]**

Photon Superfluidity through Dissipation

10.00 **Sarojini Mahajan [TU/e]**

Enhancing Nanoparticle Imaging: 3D Localization Microscopy with Plasmon-Fluorophore Interactions

Room 55-58

H

Materials Physics III

Chair

Menno Bokdam [UT]

09.00 **Zahra Golsanamlou [UT]**

First principles study of the thermal properties of thin film MoxSiY

09.15 **Arseniy Baskakov [UT]**

Infrared emissivity of MoxSiY thin films

09.30 **Mike Pols [TU/e]**

Structural Descriptors for Chiral Halide Perovskites at Finite Temperatures

09.45 **Jin Yan [TUD]**

Vacuum Deposited Perovskites with a Controllable Crystal Orientation

10.00 **David Garcia Romero [RUG]**

SnO2 for High-Performance and Stable Organic Solar Cells

Parkzaal

L

Materials Physics IV

Chair

Irene Groot [LEI]

09.00 **Yatong Wang [DIFFER]**

Data-driven discovery of intrinsic direct-gap 2D photocatalysts for overall water splitting

09.15 **Leo Sahaya Daphne Antony [AMOLF]**

In-situ probing of adhesion forces at the electrochemical solid-liquid interfaces

09.30 **Phu Tran Phong Le [UT/DIFFER]**

Electrolyte-induced Fe-doping of LaNiO3 model surfaces for water electrolysis

09.45 **Danis Badrtdinov [RU]**

Quantum simulator to emulate lower-dimensional atomic orbitals using surface nanostructures

10.00 **Tim Faber [RUG]**

Hot-carriers in metal halide perovskites: The cold carrier background effect and the hot phonon bott

Room 63-64

J

Nanoscale Physics III

Chair

Dmytro Afanasiev [RU]

09.00 **Michael Borst [TUD]**

Controlling spin-wave propagation with a superconducting gate

09.15 **Julian Hintermayr [TU/e]**

Coherent control of magnetic resonances using optical spin-orbit torques

09.30 **Adam Watson [RUG]**

Tuning the magnetic properties of self-assembled molecular networks on Au(111) and graphene

09.45 **Josse Muller [RUG]**

Three-dimensional Skyrmions in chiral non-collinear antiferromagnets

10.00 **Rik Broekhoven [TUD]**

Proposal for entanglement detection of single spins on a surface using STM

Parallel sessions 09.00 – 10.15

Room 80-81



Particle Physics I

Chair

Wilke van der Schee [UU]

09.00 Jochem Kip [RU]

Thinking inside the box:
Non-standard dark matter
annihilation and decay spectra

09.15 Alice Biolchini [Nikhef]

Lepton flavour universality tests
in penguin decays at LHCb
experiment

09.30 Anders Rehult [Nikhef]

New Perspectives for
Electron-Muon Universality in
B-Meson Decays

09.45 Max Jaarsma [UvA]

Breaking a Collision up in Pieces

10.00 Marko Brajkovic [RUG]

NEXT setup for precision mass
spectrometry of neutron-rich
heavy nuclei

Baroniezaal



Physics of Fluids III

Chair

Uddalak Sen [WUR]

09.00 Jesse Reijtenbagh [TUD]

A New Scaling Law for Drag
Forces on Accelerating Plates

09.15 Akash Raman [UT]

Electrolytic bubble evolution on
patterned electrodes

09.30 Faeze Khalighi [TU/e]

Effects of the boundary
conditions at the gas-liquid
interface on single hydrogen
bubble growth

09.45 Aleksandr Bashkatov [UT]

Coalescence driven dynamics of
hydrogen bubbles during water
electrolysis

10.00 Sowmya Kumar [TUD]

Do microalgae suspensions
exhibit heat-thickening?

Room 65



Quantum Physics V

Chair

Malte Rösner [RU]

09.00 Mengyao Hu [LEI]

Optimizing Bell Inequalities
via Tensor Network
Contractions in Tropical
Algebra

09.15 Liam Bond [UvA]

Time-Dependent Variational
Principle with Quantum
Trajectories for Open
Quantum Systems

09.30 Aritro Mukherjee [UvA]

Quantum State Reduction via
Spontaneous Unitariness
Violations

09.45 Ilya Schurov [RU]

Ground State Sign Structures
as Boolean Functions

10.00 Emiel Koridon [LEI/VU]

A hybrid quantum algorithm to
detect conical intersections

Brabantzaal



Statistical Physics & Soft condensed matter V

Chair

Andrea Giuntoli [RUG]

09.00 Gerardo Campos-
Villalobos [UU]

Utilizing Machine Learning for the
Bottom-Up Coarse-Graining of
Colloidal Systems

09.15 Corentin Laudicina [TU/e]

Size Matters: Competing
Relaxation Mechanisms in
Size-Polydisperse Supercooled
Liquids

09.30 Yann-Edwin Keta [LEI]

Disordered collective motion in
dense and persistent active
matter

09.45 Utku Gurel [RUG]

Shear Thinning from Bond
Orientation in Model Unentangled
Bottlebrush Polymer Melts

10.00 Leon Smook [UT]

Electrical Chain Rearrangement:
What Happens When Polymers in
Brushes Have a Charge Gradient?

Auditorium



Physics for Technology II + Materials Physics V

Chair

Roberto Lo Conte [RUG]

09.00 Niels Mendel [UT]

Functionalized Clays for CO₂/
CH₄ Separation

09.15 Ids van Elk [TU/e]

Smart*Light: A high brilliance
ICS X-ray Source

09.30 Marnix Vreugdenhil [UU]

Laser induced damage inside
wide band gap semiconductors

09.45 Floris van Riel [TU/e]

Laser-induced exchange bias
reversal for multiaxial sensors

10.00 Zhouping Lyu [ARCNL]

Computational Imaging via
Optical Fibers: Breaking
Resolution and Speed Barriers

Parallel sessions 10.45 – 12.00

16 Parallel sessions 10.45 – 12.00 Wednesday 24 January

Room 82-83



Astroparticle physics, gravitation, and cosmology IV

Chair

Subodh Patil [LEI]

10.45 Anthony Bwembya [RU]

Particle identification using radio detection of cosmic rays

11.00 James Mead [UvA]

PTOLEMY: Relic neutrino direct detection

11.15 Jhilik Majumdar [Nikhef]

Probing the Universe with KM3Net/ARCA: The Quest for Cosmic Neutrinos

11.30 Maricke Flierman [Nikhef]

XAMS: XENON R&D in Amsterdam

11.45 Mohamed Ismael [RU]

AugerPrime capabilities detecting Ultra-High-Energy photons

Boszaal



Atomic, Molecular and Optical Physics IV

Chair

Lukas Pasteka [RUG]

10.45 Lisanne Einhaus [UT]

Modulating Photophysics in quasi-2D Perovskites through Cation Mixing

11.00 Thomas Metzger [RU]

Impulsive Fermi magnon-phonon resonance in the non-collinear phase of antiferromagnetic CoF2

11.15 Antonios Pelekanidis [ARCNL/VU]

Multi-wavelength extreme ultra-violet ptychography enhanced by vortex field diversity

11.30 Lois Fernandez Miguez [TU/e]

Mechanistic modelling of pattern formation in photoresist for extreme ultraviolet nanolithography

11.45 Aleksei Kuevda [RUG]

Enhancing photoluminescence of light-harvesting complexes with light

Room 55-58



Materials Physics VI

Chair

Stephan Eijt [TUD]

10.45 Ewout van der Veer [RUG]

Large-scale strain mapping using real-space analysis of atomic-resolution STEM images

11.00 Giuditta Perversi [UM]

Real-space structural data-analysis of Sr2ScGaO5 oxygen-ion conductor, a neutron PDF study

11.15 Ziyang Wu [TUD]

Spectroscopic ellipsometry investigations of the photochromic effect in yttrium oxyhydride films

11.30 Guido Stam [LEI]

High quantum efficiency Cs3Sb photocathode grown in the ultra-thin limit

11.45 Sergi Campos Jara [LEI]

Synthesis and Characterization of Boron Nitride-doped Graphene

Parkzaal



Materials Physics VII

Chair

Kaveh Lahabi [LEI]

10.45 Riccardo Reho [UU]

Density Functional Theory for Superconductors: theory and implementation in the SIESTA code

11.00 Manuel Simonato [RU]

Substrate effects in layered superconducting hetero-structures with disorder

11.15 Jan Cuperus [UU]

Electronic characterization of ferromagnetic CrCl3 on NbSe2 by STM

11.30 Jeroen de Boer [AMOLF]

Microscale artificial synapses of lead halide perovskite with femtojoule energy consumption

11.45 Azminul Jaman [RUG]

Resistive switching dynamics in volatile La0.67Sr0.33MnO3 memristors for Neuronal spiking

Room 63-64



Nanoscale Physics IV

Chair

Dmytro Afanasiev [RU]

10.45 Alvaro Donis Vela [LEI]

Dynamical simulation of the injection of vortices into a Majorana edge mode

11.00 Vince van de Sande [TU/e]

Magnetoconductance oscillations in topological crystalline insulator PbSnTe nanowires

11.15 Boxuan Yang [RUG]

Electrically controlled magnetic exchange in proximity bilayer Graphene-CrSBr

11.30 Isidora Araya [TUD]

Multiterminal scattering protected by Fermi surface topology

11.45 Ata Keşkekler [TUD]

Nonlinear dynamics and dissipation in 2D material resonators undergoing magnetic phase transition

Parallel sessions 10.45 – 12.00

Room 80-81



Particle Physics II

Chair

Wilke van der Schee [UU]

10.45 Zhuoran Feng [Nikhef]

Charming decay of the Higgs boson

11.00 Matouš Vozák [Nikhef]

The ATLAS measurement of the Higgs boson lifetime

11.15 Andrea Visibile [Nikhef]

SMEFT & BSM interpretation of Higgs measurements

11.30 Andrea García Alonso [Nikhef]

The ATLAS ITk Strip Detector for the Phase-II LHC Upgrade

11.45 Uraz Odyurt [RU]

Novel Solution Design Methods for ML-Assisted Particle Track Reconstruction

Baroniezaal



Physics of Fluids IV

Chair

Uddalak Sen [WUR]

10.45 Arvind Pari [TUD]

Numerical measurement of the effective electrical conductivity of electrolyte-gas bubble dispersions

11.00 Mikheil Kharbedia [ARCNL]

Understanding non-steady fluid dynamics upon laser-droplet interaction

11.15 Jelle Schoppink [UT]

Microfluidic confinement and laser beam properties control thermocavitation

11.30 Xuefeng Shen [WUR]

Understanding stability of Pickering emulsions with ultralow particle coverage using microfluidics

11.45 Suriya Prakash [TUD]

Evaporation-driven buckling of a suspension drop of graphene oxide nanoplatelets

Room 65



Quantum Physics VI

Chair

Malte Rösner [RU]

10.45 David Dechant [LEI]

Parametrized Quantum Circuits and their approximation capacities in quantum machine learning

11.00 Stefani Valianti [TUD]

Charge-Transport Mechanisms in the Conductive Fiber Network of Cable Bacteria

11.15 Yong Yu [TUD]

Frequency tunable, cavity-enhanced single erbium quantum emitter in the telecom band

11.30 Sara Marzban [UT]

Towards a quantum memory based on an excited-state absorption in Tm:YAP

11.45 Yanik Herrmann [TUD]

Quantum Non-linear Optics with Diamond Color Centers in Fiber-based Microcavities

Auditorium



Materials Physics VIII + DPC awards winners

Chair

Roberto Lo Conte [RUG]

10.45 Ruben Guis [TUD]

Confocal Atomic Force Microscopy

11.00 Wenfeng Liu [UvA]

Ideal shock absorbers enabled by yield buckling

11.15 Thijs Roskamp [UT]

Scanning SQUID microscopy of ferromagnetic oxides selectively patterned by metallic overlayers

11.30 Jesse Slim [University of Queensland/AMOLF]

Nonreciprocal & non-Hermitian mechanics by orchestrating nanomechanical motion with light

11.45 Talieh Ghiasi [TUD]

Van der Waals Heterostructures for Spintronic Devices

Brabantzaal



Statistical Physics & Soft condensed matter VI

Chair

Andrea Giuntoli [RUG]

10.45 Nick Oikonomas

Koppas [UvA]
Activity mediated growth of polymer-like chains using Janus particles

11.00 Susana Marin Aguilar [UU]

The sausage catastrophe and the finite sphere packing problem: a colloidal viewpoint

11.15 Max Schelling [TU/e]

Inducing point defects in 3D colloidal crystals

11.30 Ruth Crothers [RU]

Rotational Dynamics and Interparticle Friction in Colloidal Liquids, Crystals and Glasses

11.45 Vincent Bertin [UT]

Sticking without contact: Elastohydrodynamic adhesion

Focus sessions 14.10 – 15.50

18 Focus sessions 14.10 – 15.50 Wednesday 24 January

Room 65

K

Understanding the physics of mass

Chairs

Wouter Verkerke [Nikhef]
Marcel Merk [Nikhef]

Pamela Ferrari [Nikhef/RU]

The Higgs mechanism as the origin of mass of elementary particles

Marta Verweij [UU]

Mass & Quantum Chromo Dynamics - Chiral symmetry as the origin of the nuclear mass

Mara Senghi Soares [VU/Nikhef]

Mass & Charge-Parity violation – CP violation in lepton and quarks

Chris Van Den Broeck [UU]

Probing massive objects in the universe

Auditorium

M

Femtomagnetism meets spintronics

Chairs

Alexey Kimel [RU]
Diana Leitao [TU/e]

Sangeeta Sharma [Max Born Institute]

Femto- phono- magnetism

Stephane Mangin [Université de Lorraine]

Engineering materials for single pulse all-optical switching

Carl Davies [RU]

Ultrafast phononic manipulation of magnetization

Reinoud Lavrijsen [TU/e]

Layered synthetic ferrimagnet based ultrafast spintronics

Baroniezaal

D

Biophysics of tissues and multicellular systems

Chair

Silke Henkes [LEI]

Kinneret Keren [Technion]

Topological defects and their role in Hydra morphogenesis

Chase Broedersz [VU]

Learning the dynamics and interaction of migrating cells

Martijn Gloerich [UMC Utrecht]

Mechanical regulation of cell division in tissue homeostasis and cancer

Liesbeth Janssen [TU/e]

From statics to dynamics: inferring cellular activity from a single image

Room 63-64

J

Nanophotonics for bio-sensing

Chair

Sergii Pud [UT]

Susana Rocha [KU Leuven]

Unraveling Hydrogel Mechanics: From Cellular to Nano Scale

Peter Zijlstra [TU/e]

Nanoplasmonic biosensing at the single-molecule level

Oluwafemi Ojambati [UT]

Probing protein conformation using coupled plasmonic nanocavities

Claudia Reyes [UMCG]

Diamond-based quantum sensing of free radicals in cells

Parkzaal

L

Low Dimensional Superconducting Phenomena

Chair

Mazhar Ali [TUD]

Malte Rösner [RU]

Interface Effects between 2D Superconductors and Correlated Quantum Materials

Chuan Li [UT]

Dirac semimetal-based quantum devices towards 1D topological superconductivity

Grzegorz Mazur [TUD]

A three-site Kitaev chain

Heng Wu [TUD]

Geometry induced superconducting diode effect

Antonija Grubisic-Cabo [RUG]

ARPES insights into the electronic structure of ultrathin Kagome insulators Nb₃X₈

Focus sessions 14.10 – 15.50

Room 55-58



NNV Focus Session:
Reflections: how does the outside world see the academic physics community?

Chair

Johan Klootwijk [Philips]

Michiel Thijssen [LEI]

Improving the stargazer's view of high school teachers on physicists in academia

Eppo Bruins [AWTI]

Physics and politics: disparate worlds. Where's the wormhole?

Calina Ciuhu-Pijlman [Philips]

ExplAInable Physics

Laura Bergshoef [NRC]

The laymen in mind? How?

Room 80-81



Anisotropic and directional interactions in soft matter systems

Chairs

Laura Rossi [TUD]

Laura Filion [UU]

Emanuela Bianchi

[Technische Universität Wien]

Particle charge heterogeneity: modeling and simulating colloids and proteins

Roel Dullens [RU]

Shaping colloidal bananas to reveal biaxial, splay-bend nematic, and smectic phases

Alfons van Blaaderen [UU]

Towards Experimental Measurement of Anisotropic Dipolar Interactions between Spherical Colloids

Paul van der Schoot [TU/e]

Impact of an Electric Field on the Shape and Structure of Nematic Tactoids

Brabantzaal



1D Dissipation-less electronic transport in 2D materials

Chair

Harold Zandvliet [UT]

Ralph Claessen

[Julius-Maximilians-Universität Würzburg]

Topology and hidden honeycomb physics in a triangular atom lattice: indenene on SiC(0001)

Carlo Beenakker [LEI]

Bloch oscillations in twisted bilayer graphene

Zeila Zanolli [UU]

Design and Control of Quantum Materials

Pantelis Bampoulis [UT]

Quantum Spin Hall States and Topological Phase Transition in Germanene

Room 82-83



Playing with nanoLEGO: emergent properties in topological soft materials

Chairs

Andrea Giuntoli [RUG]

Wouter Ellenbroek [TU/e]

Sanat Kumar

[Columbia University]

Designing Novel Polymer-Grafted Nanoparticle Membranes for Critical Gas Separations

Sissi de Beer [UT]

Switching adhesion using responsive polymer films

Rint Sijbesma [TU/e]

Breaking the mould: Covalent catch bonds in synthetic polymer networks

Daniela Kraft [LEI]

Designing reconfigurable structures at the colloidal scale

Boszaal



Exploring the Future of High Energy Physics Accelerators

Chair

Patrick Koppenburg [Nikhef]

Wouter Waalewijn [UvA]

The theory motivation for future colliders

Freya Blekman

[Universität Hamburg/DESY]

The case for an electron-positron Higgs factory

Frank Filthaut [RU/Nikhef]

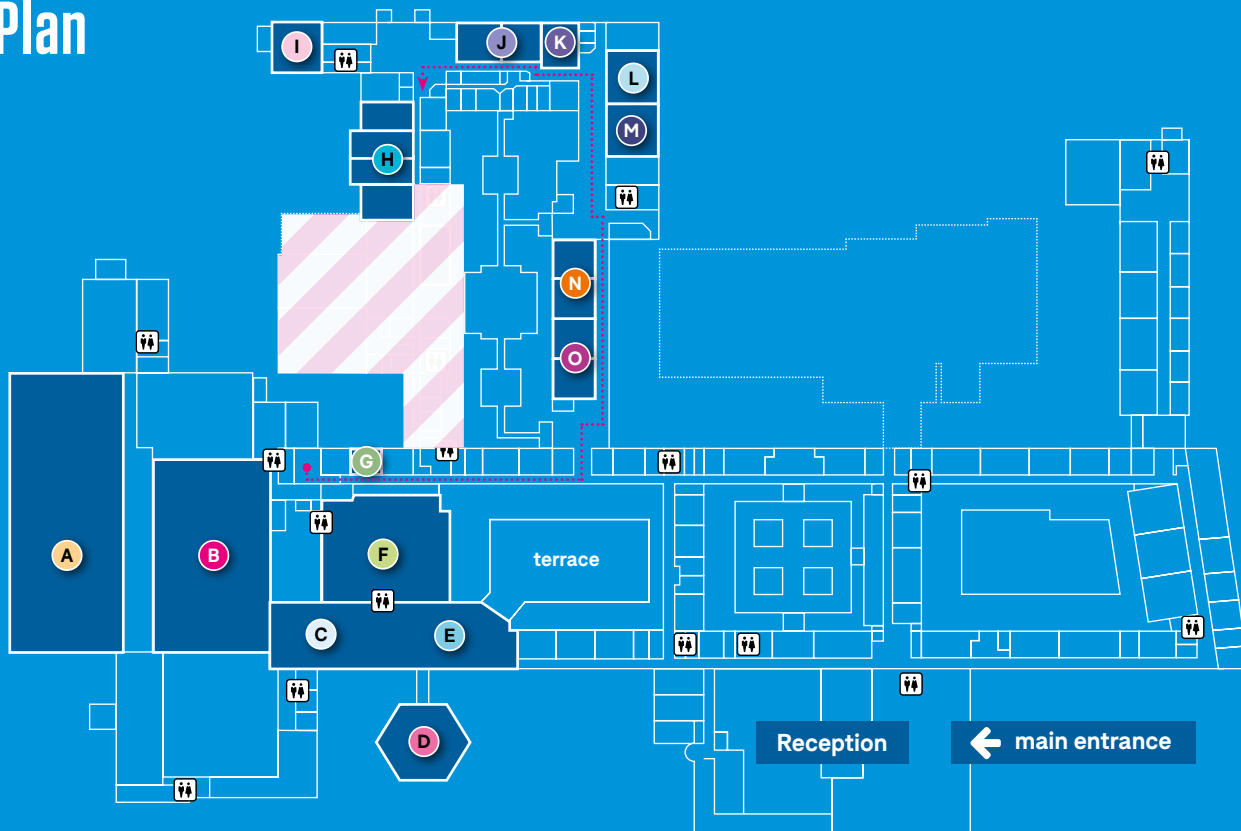
The Muon Collider, a new path to high energy

Marlene Turner [CERN]

Plasma Wakefield accelerators

Floor Plan

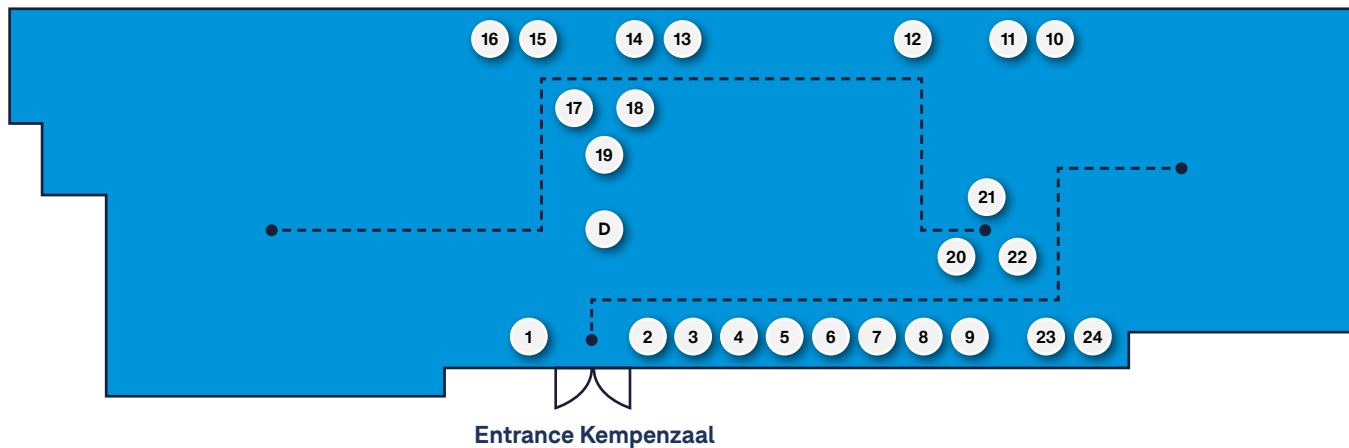
20 Floor Plan NH Koningshof



Locaties/locations & route/routes

- A Beneluxzaal B Kempenzaal C Meijerijfoyer D Baroniezaal E Limburgfoyer F Brabantzaal G Room 26 (preview room) H Room 55-58
I Boszaal J Room 63-64 K Room 65 L Parkzaal M Auditorium N Room 82-83 O Room 80-81 Toilets Closed area Detour

Exhibition floor plan @Kempenzaal



- 1 Conference Information desk
- 2 NWO
- 3 Vacancies
- 4 Lorentz Center
- 5 eScience
- 6 Hamamamatsu
- 7 Qblox
- 8 TNO

- 9 ASML
- 10 Surf
- 11 Bruker
- 12 Fujitsu
- 13 Canon
- 14 QuixQuantum
- 15 RIVM
- 16 Gildeprint

- 17 IPSkamp Printing
- 18 Te Lintelo
- 19 V.O.
- 20 Stralia
- 21 Scientia Omicron
- 22 Qphox
- 23 NNV
- 24 NWA/KIC
- D Demo FeelPen

NWO Physics 2024 Exhibitors

22 NWO Physics 2024 Exhibitors

ASML

GILDEPRINT

**Lorentz
center**

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scientaomicron

te lintelo systems bv
photonics, our passion!
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Canon

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PHOTON IS OUR BUSINESS

netherlands
eScience center

QUIX
QUANTUM

stralia

TNO

FUJITSU

IPSKAMP *printing*
thesis and more

QBLOX

 **Rijksinstituut voor Volksgezondheid
en Milieu**
Ministerie van Volksgezondheid,
Wetzijn en Sport

SURF

V.O.
Patents & Trademarks

[illegible]

Colophon

Thanks to the programme committee of NWO Physics 2024:

Tom Kodger (chair) [WUR]
Rudie Kunnen [TU/e]
Oscar Versolato [ARCNL]
Steffen Wiedmann [RU]
Freddy Rabouw [UU]
Charusheela Ramanan [VU]
Kaveh Lahabi [LEI]
Susanne Westhoff [RU]
Tanja Hinderer [UU]
Antonija Grubisic-Cabo [RUG]

Thanks to the organising team of NWO Physics 2024:

Eliane van Dam *Project leader*
Veerle Bogaards *Co-project leader*
Digna Tesink *Event assistant*
Renate Kramer *Event assistant*
Hans Peter van der Lit *Industry*
Steven Driessen
and Pam van Schouten *Communication*

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