



NSC

FINLAND



2025



NANONEWS in

2025

Editorial

Satu Kosonen
Lotta-Riina Sundberg
Fabien Cougnon
Santeri Neuvonen

Figures

Pekka Koskinen
Paavo Penttilä
Sushree Sarita Sahoo
Virginia Ranaweera

PREFACE

I would like to thank everyone at the NSC for the inspiring years! It has been a privilege to work with such a talented and collaborative community - in an environment where interdisciplinary research really thrives. I am grateful for the openness and shared ambition that made the past four years especially rewarding and memorable. We have a unique scientific community! All the best for your forthcoming scientific endeavors.



Prof. Lotta-Riina Sundberg
Scientific Director of NSC 2022-2025

I am delighted to step into the role of Scientific Director of the NanoScience Center as the new year begins. The NSC is a vibrant and inspiring community, and I have greatly enjoyed being part of it over the past years. I am now very much looking forward to contributing in a new way, supporting our scientific excellence, strengthening our collaborative spirit, and helping maintain the lively social and intellectual environment that makes the NSC such a special place to work. I wish you all an excellent start of 2026 and a productive year!



Assoc Prof. Fabien Cougnon
Scientific Director of NSC 2026-



UNIVERSITY OF JYVÄSKYLÄ

JYUnity. Strength in collaboration since 2001.

JYUnique. A unique cross-disciplinary nanoscience research environment in Finland.

JYU. Since 1863.

Announcements

WeNSC 2026
11.-12.5.2026

The 35th Jyväskylä Summer School
3.-14.8.2026

Nanoscience Days 2026
5.-6.10.2026

NSC Paper of the Year
December 2026

Seminars and Events

- Light and Matter seminar
- Nanophysics Theory seminar
- Microbiology seminar
- NSC Explain this!
- Nanoseminar
- Computational Chemistry Methods

More information:

<https://www.jyu.fi/en/science/nsc/current-at-the-nanoscience-center>

Contact info:
Nanoscience Center

P.O. Box 35

FI-40014

University of Jyväskylä Finland

<https://www.jyu.fi/en/science/nsc>
nanoscience@jyu.fi

Instagram: @jyunsc

Table of Contents

Preface	2
Major Funding for Researchers at NSC	4
Professor Tero Heikkilä will Lead New Centre of Excellence in Quantum Materials	7
Introducing New NSC Group leaders	8
Nano-Olympics & NanoFun	10
IAB - International Advisory Board meeting	11
WeNSC - Workshop for Enhancing NSC	12
Christmas Party	13
Meet the New Postdocs and PhD Students of NSC	14
Research Highlights at NSC 2025	16

Major Funding for Researchers at NSC

Novo Nordisk Foundation Awards 1,5 € million to Paavo Penttilä

Paavo Penttilä was awarded a 1,5 € million grant from the Novo Nordisk Foundation in April 2025 for research into the nanostructure of plant cell walls. His project, FibForm – Understanding the Role of Hemicelluloses in the Formation of Plant Microfibril Structures to Enable Their Informed Design, seeks to uncover how plant cell walls develop their remarkable strength and other unique properties. The project aims to provide a deeper understanding of the nanoscale mechanisms that govern plant cell wall formation, enabling the informed design of sustainable plant-based materials.

Read more: <https://www.jyu.fi/en/news/natural-materials-inspire-associate-professor-paavo-penttila>

Jane and Aatos Erkko Foundation Awards 1,4 € Million for Graphene-Based Nerve-Machine Interface Project

Professor Mika Pettersson of the University of Jyväskylä is leading the Graphene-based Nerve-Machine Interface project, which aims to develop a graphene-based nanoscale device capable of enabling two-way communication between nerves and machines. The technology could be used to transmit signals between the nervous system and a robotic hand or even a damaged muscle.



JANE JA AATOS
ERKON SÄÄTIÖ

The University of Jyväskylä and Tampere University have jointly received 1,4 € million in funding from the Jane and Aatos Erkko Foundation for the project. The long-term goal is to create the enabling technology for robotic prostheses that can not only move in response to nerve signals but also restore sensations such as touch and temperature, bringing them closer to the capabilities of a natural limb. The project is a collaboration between the Department of Chemistry at the University of Jyväskylä and the Faculty of Medicine and Health Technology at Tampere University. The project started on 1 August 2025.

Read more: <https://www.jyu.fi/en/news/innovative-project-led-by-the-university-of-jyvaskyla-awarded-eu14-million-funding-graphene-based>

Research Council of Finland, Major Funding for NSC

RCF awards nearly 600k€ to Professor Petri Pihko for EXATH Project

Professor Petri Pihko was awarded 574 315 € in funding from the Research Council of Finland for the project EXATH: Electrocatalytic X-atom Transfer and Hydride Reduction.

The main goal of EXATH is to develop selective and sustainable methods for carrying out organic reduction reactions using recyclable reductants that can be regenerated electrochemically. These novel reductants combine features of natural reducing agents, such as nicotinamides, with synthetic reductants previously used in organic flow battery materials. By harnessing electricity as the driving force, the project aims to make organic reductions as simple, efficient, and environmentally friendly as inorganic electrochemical reductions, opening new possibilities for sustainable chemical synthesis. Project started in September, 2025.

Read more: <https://www.jyu.fi/en/news/over-3-million-euros-for-research-in-the-sciences-from-the-research-council-of-finland>



Research Council of Finland

RCF awards nearly 500k€ to Professor Karoliina Honkala for Large-scale computational electrochemistry: Accelerated and accurate simulations to unravel the factors controlling bio-alcohol oxidation

ECOBIO combines advanced computational methods, electrocatalysis, and high-performance computing to study alcohol electro-oxidation for the sustainable production of hydrogen and valuable chemicals. Using the LUMI supercomputer and GPU-accelerated simulations, the project investigates how the electrochemical environment influences reaction activity and selectivity. In collaboration with experimental researchers, ECOBIO aims to develop faster simulation tools, identify key factors governing alcohol oxidation, and clarify the roles of solvents and cations in these reactions. Project will start Jan 1st, 2026.

Read more: <https://www.jyu.fi/en/news/research-council-of-finland-grants-funding-to-the-university-of-finland-for-international>

Research Council of Finland, Major Funding for NSC

Professor Gerrit Groenhof Receives 460 000 € for Exascale Molecular Dynamics Research

Professor Gerrit Groenhof received approximately 460 000 € in funding for a project on molecular dynamics simulations using exascale supercomputers. The project applies advanced computational methods to study how biomolecules interact and how proteins convert chemical energy into mechanical work. By simulating the movements of atoms in proteins and other biomolecules, the research aims to deepen our understanding of fundamental biological processes and support future drug development.

Read more: <https://www.jyu.fi/en/news/research-council-of-finland-grants-funding-to-the-university-of-finland-for-international>



Research Council of Finland

RCF awards 431 717 € for Quantum Materials Research

Academy Research Fellow, Associate Professor Kezilebieke Shawulienu received 431 717 € for a project on the atomic-scale optoelectronic control of van der Waals quantum materials. The research will develop new methods to study the magnetic and optical properties of two-dimensional materials, particularly moiré heterostructures. The goal is to understand these properties at the atomic scale and enable the development of novel materials and future optoelectronic applications.

Read more: <https://www.jyu.fi/en/news/over-3-million-euros-for-research-in-the-sciences-from-the-research-council-of-finland>

Professor Tero Heikkilä Leads New Centre of Excellence in Quantum Materials

Professor Tero Heikkilä from the Department of Physics and the Nanoscience Center at the University of Jyväskylä leads the Centre of Excellence in Quantum Materials (QMAT), which received funding in the Research Council of Finland's Centre of Excellence Programme for 2026–2033.

Led by the University of Jyväskylä, QMAT applies modern quantum information methods to study quantum materials and explore their potential in future electronics and photonics applications. The centre investigates a broad range of topics, including hybrid 2D materials, ferroelectricity, multiferroics, superconductivity, atomic-scale optics, spin liquids, fractional Chern insulators, and the role of quantum geometry in determining the properties of quantum materials. Its goals also include developing virtual materials using quantum computers and identifying novel device functionalities based on superconducting and ferroelectric hybrid structures.

The consortium brings together researchers from Aalto University, Tampere University, VTT Technical Research Centre of Finland, and the University of Jyväskylä, combining expertise across physics, materials science, and quantum technologies.

This remarkable achievement was celebrated at the Nanoscience Center with sparkling wine and cake. During the event, Professor Tero Heikkilä presented the new Centre of Excellence programme and reflected on the journey that led to its establishment.



Read more: <https://www.jyu.fi/en/research-groups/centre-of-excellence-in-quantum-materials>

Introducing New NSC Group Leaders

Stefan Ilić

In September 2023 I started my Academy fellowship at the NSC. I'm a member of the Condensed Matter theory group, within which I lead a small subgroup, consisting of myself, a postdoctoral researcher, and a PhD student.

My research focuses on mesoscopic superconductivity, spintronics and quantum transport, exploring the interplay of spin-dependent fields, disorder and quantum coherence in nanostructures and 2D materials. I usually work with simple analytical and phenomenological models with the aim of obtaining measurable predictions, often in close collaboration with experimental groups.



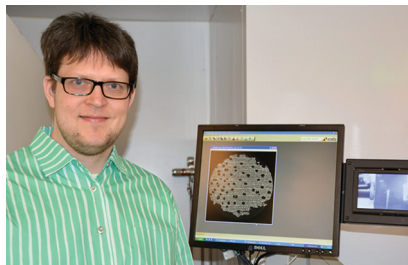
The topic of my research fellowship is the newly discovered superconducting diode effect. This effect shows up via non-reciprocal current flow when both time-reversal and inversion symmetries are broken in a superconductor: supercurrent can flow in one direction, whereas only a regular dissipative current can flow in the other. This effect attracted significant attention in the last couple of years, because exploiting it could provide a building block for the new generation of cryogenic electronics.

I will investigate the superconducting diode effect in novel atomically thin superconductors like TMDs, and in superconductor/ferromagnet hybrid nanostructures. I will also explore the optical response of supercurrent diodes and assess their potential for application as non-dissipative opto-electronic elements.

Read more: <https://www.jyu.fi/en/research-groups/condensed-matter-theory-group>

Paavo Penttilä

I'm Paavo Penttilä, an Associate Professor at the Department of Physics and Nanoscience Center. I finished my doctoral thesis in materials physics at the University of Helsinki in 2013, and spent in total four years as postdoc at Kyoto University (Japan) and Institut Laue-Langevin (France). From 2018 to 2025, I worked at Aalto University, School of Chemical Engineering, first as postdoc and later as Academy Research Fellow and group leader. I joined the University of Jyväskylä in May 2025 and started to lead the Multiscale Materials Characterization group.



In my research, I use X-ray and neutron techniques to study the structure of lignocellulose and other complex materials. I have mostly worked with scattering methods and more recently with imaging techniques. My laboratory hosts advanced X-ray tomography facilities, but we also do synchrotron and neutron experiments abroad. We develop the methods and their data analysis for various types of samples.

I enjoy solving research questions relevant for both academic research and industries. However, questions related to the fundamental structure of plant cell walls and their polymers are closest to my heart. I am genuinely interested in how living systems form structures and materials with particular properties, and how these reflect to processed materials.

In my current research projects, we investigate for instance the assembly of fibrillar cellulose structures during plant cell wall biosynthesis and develop small-angle scattering analysis methods for wood and wood-based materials. A large part of my research is related to collaborations across disciplines, and I am eager to put my expertise and methods into use in new contexts.

I am happy to be part of the multidisciplinary community of the Nanoscience Center, and am contributing to it also as a new member of the Nanoscience Center Executive Board.

Read more: <https://www.jyu.fi/en/research-groups/multiscale-materials-characterization>

Reetta Penttinen

Read more: <https://www.jyu.fi/en/research-groups/penttinen-group-ecology-and-evolution-of-bacterial-antibiotic-resistance>

Nano-Olympics



In 2025, at the first-ever NanoOlympics, teams of students and teachers faced off in a game of kyykkä on the lawn at Mattilan-niemi. On the students' team were Rita, Max (who was there from Germany), and kyykkä veterans Aku and Santeri. The teachers' team consisted of Jussi, Varpu, Lot-ta-Riina, and Fabien. The game began with both teams reviewing and learning the rules together. The rainy and windy weather didn't dampen the teams' spirits or the intensity of the game. The wooden throwing bats flew back and forth across the field. Admittedly, many players were a bit rusty. The pikes bounced around the field and some even flew



into the stands, but both teams did manage to land the occasional hit on the field. The first inning was a tight battle, and the outcome was decided during the final turns at bat, when Aku hit the kyykkä line to the right. The first pair of innings ended with a victory for the students by a margin of just five points. The next pair of innings could, of course, change everything, as the lead isn't big enough for a landslide victory. Unfortunately, the second round was decided as early as the first turn, when Santeri found his rhythm and managed to knock out the left edge of the teachers' row and even convert the fallen kyykkä pieces into points. Aku's subsequent knocks and Rita's "spring cleaning" sealed the entire second round for the students and, with it, the game's victory. After the game, the teams shook hands and congratulated each other on a great game and performance. In the fall, the students raised the trophy in the nano-sauna for the first time and celebrated it properly.



NanoFun Workshops Bring Creativity and Community Together

The NanoFun workshop series was launched in 2025 to bring NSC colleagues together through creative and inspiring activities. Organized by enthusiastic NSC staff members and invited experts, the workshops offer a chance to learn new skills, discover new hobbies, and take a break from everyday work. During 2025, participants had the opportunity to try a wide range of activities, including watercolor painting, needle felting, knitting winter hats, playing board games, and even testing their marksmanship at an air gun shooting range. Beyond the activities themselves, NanoFun strengthened the sense of community at NSC by creating opportunities for colleagues to connect, share experiences, and enjoy time together in a relaxed and welcoming atmosphere.

Read more: <https://uno.jyu.fi/fi/science/laitokset-ja-yksikot/nanotiedekeskus/nano-science-centers-nanofun-workshops>

IAB - International Advisory Board meeting in October 2025

The Nanoscience Center (NSC) has invited internationally renowned nanoscience experts to evaluate its activities and research. A two-day evaluation event has been organized for the International Advisory Board (IAB) since 2012. The latest evaluation took place in October 2025.

The IAB members 2024-2027:

Prof. Giulio Cerullo (Politecnico di Milano, Italy)

Prof. Heiner Linke (Lund University, Sweden)

Prof. Sirpa Jalkanen (University of Turku, Finland)

Prof. Peter Hegemann (Humboldt University, Germany)

Prof. Jeremy Sanders (Cambridge University, UK)

In October 2025, the Nanoscience Center (NSC) welcomed its International Advisory Board for a comprehensive review of the center's research and education activities. The board comprised internationally renowned experts in nanoscience: Professor Peter Hegemann (Humboldt University of Berlin), Professor Sirpa Jalkanen (University of Turku), Professor Heiner Linke (Lund University), Professor Giulio Cerullo (University of Milan), and Professor Jeremy Sanders (University of Cambridge).

Top publications and competitive funding demonstrate success

In its report, the advisory board highlighted the significant societal relevance of NSC's three strategic research themes: Health and Wellbeing, Sustainable Society, and the Second Quantum Revolution. The board strongly supported the continued development of these research areas in the coming years. In addition, it recognized NSC's state-of-the-art research infrastructure and its continuous development as a major competitive strength that enhances the center's international standing.

The next evaluation of NSC will take place in 2027.

Read more: <https://www.jyu.fi/en/news/nanoscience-center-impresses-international-advisory-board-strategy-and-infrastructure-at-the>



WeNSC - Workshop for Enhancing NSC

The WeNSC event and the Nanoscience Center Christmas Party were jointly organized at Scandic Laajavuori on 16 December 2025, bringing together members of the Nanoscience Center for a day filled with networking, discussions, team activities, and celebrations.

The event began with welcoming words from the organizing team and the Scientific Director of the Nanoscience Center, Lotta-Riina Sundberg. The first activity of the morning was a speed-dating session designed to help participants get to know one another. Participants were paired up and given a question to discuss for a set amount of time before moving on to a new partner and a new topic. The questions ranged from favorite foods and childhood cartoon characters to the most rewarding scientific achievements of their careers. Lively conversations and laughter filled the room throughout the session, creating a warm and relaxed atmosphere.



Later in the morning, participants took part in the Shine Your Skills activity. The activity brought together a variety of challenges that highlighted skills useful for scientists. Working in teams, participants competed in tasks involving measurement, calculation, and even accurate paper-ball throwing into a wastebasket. The friendly competition encouraged teamwork and creative problem-solving.

In the afternoon, participants explored themes related to artificial intelligence and wellbeing. Small-group discussions were followed by a panel discussion focusing on three topics: the use of AI in studies and research, the ethics of AI, and wellbeing at the University of Jyväskylä. The panel featured Professor Marko Siitonen from the Department of Language and Communication Studies, Professor of Practice Salla Toppinen-Tanner from the Department of Psychology, and Associate Professor Fabien Cougnon from the Department of Chemistry.



The day also provided an opportunity to introduce the Nanoscience Center's new principal investigators. The daytime programme concluded with a prize ceremony for the various activities, followed by closing remarks from the organizers and Lotta-Riina Sundberg.

NSC Christmas Party

The celebrations continued after WeNSC in the evening with the NSC Christmas Party. Following opening words, participants enjoyed a festive dinner buffet at the hotel restaurant. After dinner, the festivities moved downstairs to Club 21, where the evening programme included the presentation of the Best Paper Award and the entertaining Mistletoe Trivia game, which challenged participants' knowledge of classic films and songs.

The Best Paper Award was presented to Jun Liu this year. Jun participated in the competition with an outstanding video presentation and won by a clear margin. The creative and engaging entry impressed the audience, making Jun the undisputed winner of the award.

The evening concluded with live music from Nanöband and DJ Paavo Penttilä, who kept the dance floor busy and the holiday spirit high until the end of the celebration.

These events once again demonstrated the strength of the Nanoscience Center community. Throughout the day, Nanopeople, including researchers, staff members, and principal investigators, had the opportunity to connect across disciplines, share ideas, and enjoy each other's company in a relaxed and welcoming atmosphere. From engaging discussions and collaborative activities to festive evening celebrations, the event brought people together and strengthened the sense of community that makes NSC such a special place to work and study.



WeNSC Organising Team

Anniina Runtuvuori-Salmela
Satu Kosonen
Jun Liu
Amar Raj
Virginia Ranaweera
Thiwangi Rajapaksha Pathirannehelage

Christmas Party Organizing Committee

Paavo Penttilä
Reetta Penttinen
Virginia Ranaweera
Sromona Nandi
Enriqueta Noriega Benitez
Satu Kosonen

Meet the New Post Docs and PhD Students

1. What is your name, your group leader, and your core field at NSC?
2. What is your project and how often do you visit at the NSC building?
3. Why do you want to be part of NSC?
4. What is your major scientific finding in year 2025?
5. What should researchers at NSC do together in year 2026?



1. My name is Su-shree Sarita Sahoo, and I am a post-doctoral researcher in the low-dimensional nanomaterials modeling group led by Prof. Pekka Koskinen. Our group's research focuses on the computational study of

low-dimensional materials, using first-principles methods to investigate their structural and electronic properties.

2. I am currently working on studying the properties of metallenes. As a computational researcher, I mostly work at NSC on weekdays.

3. NSC is an interdisciplinary center that brings together researchers from different scientific backgrounds and encourages collaboration across fields. I value the open and supportive research environment, as well as the opportunities for discussions and knowledge exchange among researchers at different career stages.

4. In 2025, I completed my PhD, where my work focused on the study of thermoelectric and topological properties of layered materials, which is presented in my doctoral dissertation.

5. In 2026, it would be valuable for NSC researchers to further strengthen interactions across different groups, for example through shared seminars, informal discus-

sions, or collaborative activities that bring together theory, modeling, and experiments.

6. Outside of research, I enjoy reading fictional books and cooking. I also like experimenting with new recipes, which I find to be a relaxing and creative activity.



Hi! My name is Laureline Treps. I'm a post-doctoral researcher in Karoliina Honkala's group, working on Minttu Smith's (formerly Kauppinen) project entitled Lignin Upgrading with Selective Hydrotreatment Catalysts.

I am currently doing computational chemistry, using density functional theory (DFT) to model catalyst surfaces and the phenomena occurring on them. First, I study the surface state of the catalyst (here, MoS_2): what the surface looks like under experimental conditions and how to build a relevant model of it. Second, I investigate the adsorption of simplified lignin models (since real lignin is a large and computationally expensive molecule). Finally, I will study the kinetics of the depolymerization and hydrodeoxygenation reactions of these simplified lignin structures in order to obtain meaningful insights into the reaction pathways—what controls

the rate, and which steps drive the overall reaction speed.

I am very happy to be part of NSC, to meet an international community, and to share scientific interests with colleagues from different fields (physics, biology, and chemistry). I also enjoy seeing how international researchers adapt to Finland and appreciate all the advice that helps with integrating into the country.

My personal highlight of the year is moving here—this is my first post-doc abroad, and I moved with my whole family. We are very pleased to be here. A more scientific achievement is that I submitted three papers this year (one already published); it's the first time I have written so much in a single year!

What I would love NSC researchers to do together is simply to have more opportunities to talk with each other. This could be through sharing international dishes at lunch or continuing joint activities (discovering disc golf and playing board games was amazing!). I also love origami and sports, so I'd be happy to find colleagues interested in trying origami or occasionally going for a run, cross-country skiing, climbing, or playing badminton.

A fun fact about me: I'm very passionate about dog sports, and I practice both agility and swimming with my dogs!



1. Hi, my name is Virginia Ranaweera, and my group leader is Andreas Johansson. My main research is focused on flexible substrates for graphene.

2. My PhD project focuses on fabrication of graphene devices on flexible

substrates. Currently, I am working on utilising PDMS as a functional substrate for

graphene. I spend all my work time at the NSC as all my workstations and my office is at NSC.

3. NSC has such a vibrant multi-national and multidisciplinary community. The variety of technology and facilities, including the cleanroom provides a comprehensive research environment. What excites me the most about NSC is the open and equal opportunity to grow; not just scientifically, but in many other aspects such as communication, culture, collaboration, inclusion etc.

4. In the first few months of 2025, I completed my Master's research and thesis, where I worked on a novel fabrication method for the transfer of graphene, its success was a breakthrough for me and the project I work in. Subsequently, I began my PhD developing the method further.

5. In the last semester, I really enjoyed the Nanofun workshops. It would be nice to have them more frequently.

6. I can cross-stitch 30 000 squares and I love travelling! :)

Highlights at NSC in 2025*

Programmable Assembly of Multistranded Helices in Water

Delcourt, D., Arumugaperumal, R., Verma, P. et al. Programmable Assembly of Multistranded Helices in Water. *Nat Commun* 16, 10955 (2025). <https://doi.org/10.1038/s41467-025-67227-0>

Superconducting junctions with flat bands

P. Virtanen, R.P.S. Penttilä, P. Törmä, A. Díez-Carlón, D.K. Efetov, and T.T. Heikkilä, *Phys. Rev. B* 112, L100502 (2025)

Probing the Flat-Band Limit of the Superconducting Proximity Effect in Twisted Bilayer Graphene Josephson Junctions

A. Díez-Carlón, J. Díez-Mérida, P. Rout, D. Sedov, P. Virtanen, S. Banerjee, R.P.S. Penttilä, P. Altpeter, K. Watanabe, T. Taniguchi, S.-Y. Yang, K.T. Law, T.T. Heikkilä, P. Törmä, M.S. Scheurer, and D.K. Efetov, *Phys. Rev. X* 15, 041033 (2025).

Development of an Interaction Model of the Protein–Nanocluster Interface by Machine Learning–Assisted Clustering of Amino Acids

B. Ferrari, Z. Fallah, M. Khatun, and H. Häkkinen, “Development of an Interaction Model of the Protein–Nanocluster Interface by Machine Learning–Assisted Clustering of Amino Acids.” *Aggregate* (2025): e70213. <https://doi.org/10.1002/agt2.70213>

Tuning the Electrical Properties through Metal-Ion-Mediated Assembly in Au₂₅ Nanocluster-Based Frameworks

Kim, S., Jääskö, H., Park, K. C., Malola, S., Häkkinen, H., & Park, S. S. Tuning the Electrical Properties through Metal-Ion-Mediated Assembly in Au₂₅ Nanocluster- Based Frameworks. *JACS* Vol. 147, p. 30803 (2025). <https://doi.org/10.1021/jacs.5c06695>

Lateral graphene-metallene interfaces at the nanoscale

M. Bagheri and P. Koskinen, Lateral Graphene-Metallene Interfaces at the Nanoscale, *Nanoscale* 17, (2025) <https://doi.org/10.1039/D5NR02770E>

Thermoelectric Energy Conversion in Molecular Junctions Out of Equilibrium

R. Tuovinen and Y. Pavlyukh, Thermoelectric Energy Conversion in Molecular Junctions Out of Equilibrium, *PRX Energy* 4, 043003 (2025) <https://doi.org/10.1103/rj3h-8z3g>

39

Group leaders*

147

Peer-reviewed scientific
articles in 2025 (status as of
26 January 2026).**

* Data taken from the NSC websites on 9.9.2026.

**Applied filters: Included (1) Monitoring Target (Type) + Faculty of Mathematics and Science (Top-level Name) + Nanoscience Center (Name Fi), Year: 2025, Publication status: 4 (Public) or 5 (Completed), Ready for Ministry of Education and Culture (OKM) reporting: Yes, OKM reporting readiness: Yes, Publication status: 5 (Completed) or 4 (Public)

Intrinsically disordered enteropathogenic *E. coli* EspF exploits motif mimicry in high-affinity binding to neural Wiskott-Aldrich syndrome protein and sorting nexin 9
H. Tossavainen, M. Karjalainen, L. Antenucci, M. Hellman & P. Permi. Intrinsically disordered enteropathogenic *E. coli* EspF exploits motif mimicry in high-affinity binding to neural Wiskott-Aldrich syndrome protein and sorting nexin 9. *Int. J. Biol. Macromol.* Volume 330, Part 3, 2025. <https://doi.org/10.1016/j.ijbiomac.2025.148227>

Realisation of de Gennes' absolute superconducting switch with a heavy metal interface
Hisakazu Matsuki, Alberto Hijano, Grzegorz P. Mazur, Stefan Ilić, Binbin Wang, Iuliia Alekhina, Kohei Ohnishi, Sachio Komori, Yang Li, Nadia Stelmashenko, Niladri Banerjee, Lesley F. Cohen, David W. McComb, F. Sebastián Bergeret, Guang Yang & Jason W. A. Robinson Link: <https://www.nature.com/articles/s41467-025-61267-2>

Aqueous-based lignin extractions from birch, wheat, and oat exhibit broad antimicrobial activities
Liu, J., Haapakoski, M., Sundberg, L.-R., Vähäsalo, L., Vento, P., Pöysti, M., & Marjomäki, V. (2025). Aqueous-based lignin extractions from birch, wheat, and oat exhibit broad antimicrobial activities. *Int. J. Biol. Macromol.*, 319, 145736. <https://doi.org/10.1016/j.ijbiomac.2025.145736>

Genomic and structural insights into Jyväskylävirus, the first giant virus isolated from Finland
G. M. D. F. Almeida, I. Arriaga, B. L. de Azevedo, M. Leppänen, J. S. Abrahao, J. Andreani, Davide Zabeo, J. Ravantti, N. G. A. Abrescia, L.-R. Sundberg: Genomic and structural insights into Jyväskylävirus, the first giant virus isolated from Finland. *eLife*13:RP103492 <https://doi.org/10.7554/eLife.103492.3>

Ultrasensitive ratiometric fluorosensor for enteroviral RNA detection based on improved electron transfer between carbon dots and ethidium bromide
A. Pathak, A. Raj, S. Larsson, A. B. Patil, A. K. Singh, Mira Laajala, T. Kumpulainen, V. S. Marjomäki, and J. J. Toppari. *Carbon* 2025, 238, 120222.

Near-Field Optical Nanopatterning of Graphene
Publication: Near-Field Optical Nanopatterning of Graphene, Gour Mohan Das, Eero Hulkko, Pasi Myllyperkiö, Andreas Johansson, Mika Pettersson, *Small Science*, 2025 <https://doi.org/10.1002/smssc.202500184>

Top 3	Authors (no. of publications, PI)
1	H. Häkkinen (12)
2	L-R. Sundberg (9)
3	H. Takala, A. Miettinen, K. Honkala, G. Groenhof (8)

