In 2017, NanoLund:  
Included 8 ERC Awardees  
Participated in 14 EU projects  
Coordinated 5 EU projects & 1 Marie Curie European individual fellowships

**TRENDS**

**Funding over time (MSEK)**

- **2010**: 61 MSEK  
- **2011**: 71 MSEK  
- **2012**: 89 MSEK  
- **2013**: 82 MSEK  
- **2014**: 124 MSEK  
- **2015**: 124 MSEK  
- **2016**: 143 MSEK  
- **2017**: 123 MSEK  

**Total number of publications**

- **2010**: 138  
- **2011**: 134  
- **2012**: 142  
- **2013**: 185  
- **2014**: 132  
- **2015**: 139  
- **2016**: 177  
- **2017**: 171

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**At the Forefront of Nanoscience**

During 2017 we took important steps forward in a number of processes that will shape the way NanoLund will develop in the next 10 years.

In one such process we developed, during a series of inspiring workshops and discussions, a set of joint core values (see page 17) describing the culture we aspire to for NanoLund. These guiding principles offer help in big and small decisions, and provide a common ground for our large and diverse environment.

We also continue to work hard for the opportunity to establish future NanoLund activities in Science Village in close synergy with MAX IV and ESS. Towards this aim, we are moving forward in planning the new Lund Nano Lab, including a targeted, professional fundraising effort, we actively help in developing Lund University’s strategy for Science Village, and we help develop the pilot production facility ProNano.

Our vision is that, in five to ten years, NanoLund will be at the center of what will be Europe’s place to be for research on highly controlled semiconductor nanostructures.

During the year, NanoLund has been moving forward also in measurable units, such as an increase of the average journal impact factor (JIF) of the journals we publish in, to now above 7 (see page 6). I am particularly glad to see that we balance the high-impact papers by also publishing a large number of in-depth works in archival journals with long-lasting value. This balance of depth and visibility is a hallmark of a truly pioneering environment.

Thank you to all our technical and administrative staff, teachers and scientists for all your enthusiastic work, and to our collaborators, funders, university and regional leaders as well as industry representatives for all your support. None of what we do would be possible without you.

HEINER LINKE  
NANOLUND DIRECTOR
PEOPLE & SELECTED NEWS

PERSONNEL & MEMBERSHIP

The number of individuals involved in NanoLund is roughly the same in total for all categories in 2017 compared to 2016, except for a slight increase in the number of PhD students (+11 people) compared to the previous year. The average annual level of engagement in NanoLund overall is about 60%, which corresponds to 201 full-time equivalents. Looking at the long-term trends, we note that the number of PIs has been approximately constant for the past eight years, while all other categories have been growing. This indicates a healthy growth of the individual research groups and infrastructures.

Gender Balance 2017

NanoLund strives for gender balance and being a diverse and inclusive workplace. Current stats are:

- PIs: 24% women 76% men
- Postdocs: 28% women 72% men
- PhD stud.: 42% women 58% men

NanoLund people by faculty, 2017

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- PIs: 24% women 76% men
- Postdocs: 28% women 72% men
- PhD stud.: 42% women 58% men

NANOPIRE WIRE WEEK 2017

2017-05-05 - 2017-06-02

The annual international Nanowire Week was held in Lund this year with Kimberly Dick Thelander as Chair. Nanowire Week is the merger of two well-established and highly successful annual workshops: NANOPIRE WIRE and the Nanowire Growth Workshop. Nanowire Week covered all topics of nanowire-related research, from fabrication and fundamental properties to applications. This year saw over 200 participants gathering from all over the world to discuss nanowire science in an open and dynamic environment.

Open questions, unexpected findings, and unconventional ideas are always encouraged at the Nanowire Week.

TÖNU PULLERITS IN THE ACADEMY

2017-05-16

Tönu Pullerits was elected foreign member of the Academy’s Class for chemistry at the General Meeting of the Royal Swedish Academy of Sciences.

EUROPEAN RESEARCH COUNCIL STARTING GRANT TO PETER JÖNSSON

2017-09-12

Peter Jönnson has been granted an ERC Starting Grant of 1.5 M Euro for 5 years. The project named SELFOR explores how an immune response starts at a molecular level, and how our immune system can separate between “self” and “foreign” molecules.

THE UNBELIEVABLE SPEED OF ELECTRON EMISSION FROM AN ATOM

2017-11-28

Anne L’Huillier has been involved in a study clocking how long atomic emission of electrons takes. The result: 20 billionths of a billionth of a second. The stopwatch consists of extremely short laser pulses. Hopefully, the results will provide new insights in some of the most fundamental processes in nature.

MOBILE PHONE MICRDIAGNOSTICS

2017-04-03

The Swedish Research Council has decided to support a project lead by Jonas Tegenfeldt on diagnosing disease such as sleeping sickness and malaria in remote locations in Africa with the help of a nanotechnology based device coupled to a mobile phone camera. The method will enable quick and precise diagnosis with minuscule samples.

KNUT AND ALICE WALLENBERG GRANT TO KIMBERLY DICK THELANDER

2016-10-03

NanoLund scientists led by Kimberly have been awarded 34.2 MSEK over five years for the project “Controlled atomic scale 3D ordering for exotic electronic phases”. The highly competitive grants give the researchers the opportunity to try out new and bold ideas over an extended period.

EFICIENT BIOSSE SORS WITH SILVER ATOM NANOCLUSTERS

2017-07-07

Donatas Zigzantis and Erling Thyrhaug from NanoLund, with researchers from the University of Copenhagen, studied nanoclusters consisting of 20 silver atoms. For the first time, the researchers identified an ultrafast energy flow linked to the structural changes that occur when light excites these nanoclusters.

GOOGLE INVESTS IN GLO’S MICROILED

2017-08-25

Rapidus reports that Google Inc has invested 120 MSEK in Glo, a spin-out from NanoLund. Glo is developing RGB direct-emitting display panels with better contrast and lower power consumption than LCD screens while yielding higher overall brightness than OLED. In total Glo has attracted about 1200 MSEK in investments since the start in 2008.

21 MILLION FOR SOLVOLTAICS

2017-08-15

NanoLund spin-out SolVoltaics secured 21 million US dollars in a funding round over the summer. The new financing will be used to accelerate commercialization of its highly anticipated solar efficiency boosting technology, SolFiT™ which promises to increase conventional solar panel efficiencies by up to 50%.

RESEARCH ENVIRONMENT FUNDING

2017-02-23

Jens Schouenborg was awarded 24 MSEK over six years in a VR research centre grant for his project (Swedish title): “Utveckling av implantanter och vårdnadsvanlig opto-elektrisk teknik för att montera och kommunicera med den medvetna hjälmernervcellen”.

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NanoLund scientists led by Kimberly have been awarded 34.2 MSEK over five years for the project “Controlled atomic scale 3D ordering for exotic electronic phases”. The highly competitive grants give the researchers the opportunity to try out new and bold ideas over an extended period.
2017 has seen a significant improvement in the quality of publications with a relatively high average Journal Impact Factor (JIF) of 7.2 of the journals we publish in for the environment overall.

22% of publications relevant to nanoscience in 2017 were published in journals with a journal impact factor larger than 10. This is a great improvement over last year already high value (14%), but we reserve judgement on any single year until we are ready to observe trends over a longer term. The bibliometrics of NanoLund in the field of nanowires has for many years been on a par with the other world-leading research centres at UC Berkeley and Harvard.

The overall distribution of the journal impact factor remains similarly shaped compared to last year, with the significant changes being a shift in numbers towards higher impact factor journals. We consider the balance between high-impact factor papers with high visibility, and publications in archival journals with lower JIF, a very good sign.

ELECTRONIC STRUCTURE CHANGES DUE TO CRYSTAL PHASE SWITCHING AT THE ATOMIC SCALE LIMIT

The perfect switching between crystal phases with different electronic structure in III–V nanowires allows for the design of superstructures with quantum wells only a single atomic layer wide. However, it has only been indirectly inferred how the electronic structure will vary down to the single atomic layer wide. However, it has only been indirectly inferred how the electronic structure will vary down to the ultimate limit of atomistic band structure engineering of quantum confined structures. Further, it indicates that band gap values obtained for the bulk are reasonable to use even for the smallest crystal segments. However, we also find that the suppression of surface and interface states could be necessary in the use of this effect for engineering of future electronic devices. (Abridged abstract.)

PUBLICATION HIGHLIGHTS OF THE YEAR

NanoLund PI: Kenneth Wärnmark
doi:10.1021/acsnano.7b05873

A LOW-SPIN FE(III) COMPLEX WITH 100-PS LIGAND-TO-METAL CHARGE TRANSFER PHOTOLUMINESCENCE

Transition-metal complexes are used as photosensitizers, in light-emitting diodes, for biosensing, and in photocatalysis. A key feature in these applications is excitation from the ground state to a charge-transfer state; the long charge-transfer-state lifetimes typical for complexes of ruthenium and other precious metals are often essential to ensure high performance. There is much interest in replacing these scarce elements with Earth-abundant metals. Here we present an iron complex and show that the superior sigma-donor and pi-acceptor electron properties of the ligand stabilize the excited state sufficiently to realize a long charge-transfer lifetime of 100 picoseconds (ps) and room-temperature photoluminescence. Intriguingly, there is an absence of intersystem crossing, which often gives rise to large excited-state energy losses in transition-metal complexes. These findings suggest that appropriate design strategies can deliver new iron-based materials for use as light emitters and photosensitizers. (Abridged abstract.)

NanoLund PI: Anders Mikkelsen
doi:10.1021/acs.nano.7b05873

Electronic Structure Changes Due to Crystal Phase Switching at the Atomic Scale Limit

The perfect switching between crystal phases with different electronic structure in III–V nanowires allows for the design of superstructures with quantum wells only a single atomic layer wide. However, it has only been indirectly inferred how the electronic structure will vary down to the smallest possible crystal segments. We use low-temperature scanning tunneling microscopy and spectroscopy to directly probe the electronic structure of Zinc blende (Zb) segments in Wurtzite (Wz) InAs nanowires with atomic-scale precision. We find that the suppression of surface and interface states could be necessary in the use of this effect for engineering of future electronic devices. (Abridged abstract.)

Nanoscience papers 2017, Journal Impact Factor distribution (160 of 171 have well-defined JIF).
2017 SELECTED HIGHLIGHTS PER RESEARCH AREA

MATERIALS SCIENCE

We showed through atomically resolved STM that Sb preferentially incorporates into the surface layer of Zn rather than WZ segments (by a factor of 4). DFT calculations show that this is related to differences in the energy barrier for the Sb–As exchange reaction.

Subareas:
• Controlled fabrication of advanced nanostructures
• Characterisation and properties
• Developing new processes and applications

Coordinator & Co-coordinator:
• Reine Wallenberg
• Maria Messing

Nano Lett. 17, 6, 3634-3640 (2017)

QUANTUM PHYSICS

We proposed a set up for minimal witness of entanglement between two flying electron qubits. Here only two current cross correlation measurements are needed, for any settings. All entangled pure states, but not all mixed ones, can be detected in this setup with exception of maximally entangled states (Bell states), which require three measurements.

Subareas:
• Transport Physics
• Quantum Information
• Optical Physics

Coordinator & Co-coordinator:
• Stephanie Remann
• Niklas Sköld (to Sept 2017), Ville Mäisä (from Sept 2017)


NANOENERGY

We demonstrated that semiconductor nanowires are versatile building blocks for optoelectronic devices by enabling the growth of ternary alloy nanowires in which the bandgap is tunable over a large energy range, desirable for optoelectronic devices. We also demonstrated degenerate p-doping levels in InGaP nanowires by making an Esaki tunnel diode.

Subareas:
• Nanowire photovoltaics
• Light Emitting Diodes
• Nanothermodynamics

Coordinator & Co-coordinator:
• Magnus Borgström
• Peter Samuelson


We demonstrated that plastic nanoparticles reduce the survival of aquatic zooplankton and penetrate the blood-to-brain barrier in fish and cause behavioural disorders. For the first time, we uncovered direct interactions between plastic nanoparticles and brain tissue. Our findings demonstrate that plastic nanoparticles disrupt the function of ecosystems.

Strategic aims:
• Building a strong nanosafety community
• Supply of expertise and communication in nanosafety
• Support of knowledge building about occupational and environmental exposure and biological effects

Coordinator & Co-coordinator:
• Tommy Cedervall
• Anders Gudmundsson

Nature Scientific Reports 7, 11452 (2017)

NANOSAFETY

We reported that ground state depletion (GSD) nanoscopy resolves heterostructured semiconductor nanowires formed by alternating GaP/GaInP segments (“barcodes”) at a 5-fold resolution enhancement over confocal imaging. The far-red excitation wavelength make GSD nanoscopy attractive for imaging semiconductor structures in biological applications.

Subareas:
• Nanowires for interaction with neurons
• Fundamental cell-nanowire interactions
• Single-molecule and single-cell biophysics

Coordinator & Co-coordinator:
• Jonas Tegenfeldt
• Jens Schuenborg


NEURONANOSCIENCE AND NANOBIOLGY

Fig. 1 from Minimal Entanglement Witness from Electrical Current Correlations. Schematic of the generic entangler-detector setup, consisting of an entangler and two detector systems A and B. The entangler generates split pairs of entangled electrons, in either spin or orbital degrees of freedom.

Fig. 2 from Crystal Structure Induced Preferential Surface Alloying of Sb on Wurtzite/Zinc Blende GaAs Nanowires

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Fig. 2, Food chain from brain damage and behavioural disorders in fish induced by plastic nanoparticles delivered through the food chain. The image shows the food chain from algae-zooplankton-fish, nanoparticles (53 nm mass (dark blue), 53 nm surface area (light blue) and 180 nm (red)). The article in question generated a lot of visibility internationaly due to several news outlets picking up the story.

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People in this research area offered a path to continue Moore’s law by addressing the major challenge, of integrating III–V’s on Si using vapor-liquid–solid grown vertical nanowires. They demonstrated vertical III–V MOSFETS achieving off-current below 1 nA/μm while still maintaining on-performance comparable to InAs MOSFETS. This approach opens a path to address not only high-performance applications but also IoT applications that require low off-state current levels.

Subareas:
• Nanoelectronics
• Spin based devices
• Nanophotonics

Coordinator & Co-coordinator:
• Mats-Erik Pistol
• Erik Lind

Nano Lett. 17, 10, 6006-6010 (2017)

We showed through atomically resolved STM that Sb preferentially incorporates into the surface layer of Zb rather than WZ segments (by a factor of 4). DFT calculations show that this is related to differences in the energy barrier for the Sb–As exchange reaction.

Subareas:
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Subareas:
• Nanoelectronics
• Spin based devices
• Nanophotonics

Coordinator & Co-coordinator:
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• Erik Lind

Nano Lett. 17, 10, 6006-6010 (2017)
THE LUND NANO LAB (LNL)

NanoLund is the host of and responsible for LNL, an open access state-of-the-art scientific nanofabrication facility. LNL trains about 100 students per year, is integrated in the national facility MyFab, and is also (together with nCHREM) part of the European NFFA-EUROPE distributed nanofoundry and nano-analysis infrastructure. LNL has an epitaxy lab with advanced tools for 'bottom-up' growth of III-V semiconductor epitaxial layers, and nanostructures. It also has a process lab with tools for 'top-down' fabrication and characterization of nanostructures.

KEY FEATURES OF LNL ARE:
• Fabrication and analysis of nanometer-scale structures
• Integration between epitaxy and processing
• Open cleanroom facility for academic research and companies
• 650 m² ISO 5-7 cleanrooms for cutting edge nanofabrication

2017 LNL STATISTICS

52,090 Hours booked
139 Active users
114 University users
25 External users
84 Total tools, of these tools are bookable
64

RESEARCH HIGHLIGHT

Researchers working at LNL developed a microfluidic sorting device that fractionates a mixed bacterial population into subpopulations based on the shape of the bacteria. In this way, they have successfully demonstrated the purification of single cocci and diplococci as well as the enrichment of chains from a standard sample of cultured bacteria. The devices are made using soft lithography based on a mold defined using UV-lithography.


LNL is a member of:

myfab

nCHREM - NATIONAL CENTER FOR HIGH-RESOLUTION MICROSCOPY

State-of-the-Art tools for Electron Microscopy

The facility is situated within the Chemical Center at Lund University. We offer expertise in imaging, element analysis, and sample preparation for a wide variety of sample types. The nCHREM also provides equipment for element analyses, specimen preparation, image calculation, processing and documentation, including equipment for plunge-freezing of liquids and cryogenic imaging. We have experience in problem solving and many industrial partners have used our expertise. The facility has analysed all kinds of materials from biological samples to high-tech electronic chips. We also give advice on how to best prepare samples and troubleshooting for other facilities. The usage stats below are the division of active time on the available instruments.

Figure: Graphic summary of the bacterial shape sorting project. A mixed population of the bacteria enter the device at the left-hand side in the small entrance channel. The trajectories of the bacteria now depend on the state of the bacteria. Single cocci move straight. Chains are entirely deflected. Diplococci move in intermediate trajectories.

LUND NANO CHARACTERISATION LABS

NanoLund possesses an extremely wide range of world-class characterization techniques ranging from microscopes capable of single-atom imaging to facilities for telemetric monitoring of animals. These characterization laboratories are, in contrast from the Lund Nano Lab, distributed across Lund University.

NanoLund’s interdisciplinary environment spans the departments of physics, chemistry, biology, medicine, and electrical engineering at Lund University. Researchers at these departments are involved in groundbreaking methodological developments in areas such as: electrical and optical nanocaracterization, ultra-fast laser spectroscopy, scanning probe microscopy, transmission electron microscopy, synchrotron-based imaging, spectroscopy and scattering, nanosafety, computational quantum chemistry, biocompatible nanoelectrodes, and many-body and transport theory.

Members of NanoLund are also users of major cutting-edge characterization facilities at Large scale Research Infrastructures (LRIs), such as the MAX IV synchrotron in Lund. NanoLund members are also frequent users of neutron facilities worldwide and collaborate with the ESS ERIC. Some members are also actively involved in the development of beamlines at MAX IV and other LRIs.
SUPER-RESOLUTION STED MICROSCOPE LABORATORY AT NANOLUND

Project leaders for the brand new STED operations in NanoLund are Jonas Tegenfeldt and Christelle Prinz, who gratefully received support of 5 MSEK from the Crafoord foundation and also from the ERC for this laboratory. Pictured on the left is Elke Hebisch, a NanoLund postdoc who did her PhD in the group of Stefan Hell who in 2014 received the Nobel Prize for his work on stimulated emission depletion (STED) microscopy. In the background is Jason Beech, researcher and lab responsible.

EDUCATION & OUTREACH

UNDERGRADUATE EDUCATION

The Engineering Nanoscience curriculum at LTH (Faculty of Engineering) is one of the few complete degree programmes in nanoscience in the world that starts at university entrance level and leads to a Master’s degree. It was initiated in 2003 by NanoLund scientists.

The programme is a unique symbiosis of education and research. Teaching is driven by high-level research activities in the field, and research benefits from the highly qualified graduates leaving the programme. It provides a holistic perspective of nanoscience, in which specially designed courses in biology, biochemistry and medicine broaden the foundation provided by subjects such as physics, maths and chemistry.

Since the programme was instigated, there has always been less places than applicants, even though the last five years have seen a decline in application pressure due to a general downward trend in applicants to physics subjects. Historically the gender balance fluctuates regularly from year to year with female participation between 18%-37% in the period 2008-2017.

OUTREACH

NanoLund members perform many outreach activities during the year. Some of the most important of these are popular science talks and outreach to the public, local schools and our undergraduate recruitment base. In addition, and to reach a larger international audience, we regularly publish press releases that are often widely distributed over the internet.
The schematics above imply that improving absorption of sun light through nanowires is strongly dependent on understanding the photochemical processing on the nanowire-based solar cells.
INNOVATION

2017 NANOLUND AWARDS

NANOLUND AWARD FOR EXCELLENT TECHNICAL AND ADMINISTRATIVE SUPPORT
The outstanding work done by technical and administrative support staff is of critical importance for Nanolund, and none of our work in teaching and research would be possible without it. This award recognises outstanding achievements for TAP personnel. This year’s award was presented to:
- Anders Kvennefors, Research Engineer, Solid State Physics
- Katarina Lindqvist, Admin & Financial Officer, Mathematical Physics

NANOLUND YOUNG TEACHER AWARD
Teaching is a very important part of our mission, and we are proud of the achievements by our young teachers. The awards recognise extraordinary commitment to teaching by junior scientists. In 2017 they were presented to:
- Fredrik Brange, PhD student, Mathematical Physics
- Frida Lindberg, PhD student, Solid State Physics
- Linus Ludvigsson, PhD student, Solid State Physics
- Gaute Otnes, PhD student, Solid State Physics
- Tinna Palmadottir, PhD student, Biochemistry

NANOLUND JUNIOR SCIENTIST IDEAS AWARD
Nanolund seed projects give junior scientists (master students, PhD students and postdocs) the opportunity to propose and carry out new projects that are complementary to existing research directions in Nanolund. In the 2017 project call, ten projects were received and evaluated by a group of senior scientists and PhD students, with an emphasis on originality, feasibility and potential impact. Four projects were selected for funding by a one-time sum of 100,000 SEK for research expenses:
- Daniel Finkelstein-Shapiro, Postdoc at Chemical Physics, for Nanowire-gas interaction: from surface site probes to sensors
- Stéfan Bragi Gunnarsson, PhD student at Biochemistry and Structural Biology, for Three dimensional imaging of proteins on nanowires
- Hanna Kindlund, Postdoc at Solid State Physics, for Atomic ordering in group III-V ternary semiconductor nanowires
- Pierre-Adrien Mante, Postdoc at Chemical Physics, for Nanowires for efficient terahertz emission

NANOPRODUCTS FOR THE FUTURE
Nanolund has always been an active breeding ground for new technologies, with startups coming from the environment amassing over 1.5 billion SEK in investments and leading to over a thousand Full Time Equivalents in jobs in total so far.

Companies that have come from the Nanolund environment include: Glo AB, SolVoltaics AB, Obducat technologies, Dunano AB and Hexagem. The environment also interacts with a number of large and established companies every year, not the least through the Lund Nano Lab. The core of Nanolund’s success in pushing nanotechnologies to market is a focus on nanowire science-based materials production platforms.

Researchers from Nanolund have invented Aerotaxy, a patented continuous and industrially scalable nanowire production technology which is the basis for SolVoltaic’s products. The blue banner above is a microscopic image of these nanowires. Researchers from Nanolund have also managed to produce zero-defect Gallium Nitride substrate materials, the technology basis for the company Hexagem and a key enabling technology which can be used, among other things, for direct-emitting LEDs and next-generation power electronics.

In order to accelerate the development of new nanotechnology and to fully leverage the competence and the innovation ecosystem around MAX IV and ESS, Nanolund is a key partner in the establishment of the ProNano pilot production infrastructure, managed by RISE and to be co-located with the new Lund Nano Lab in Brunnsäng.
**FUNDING**

**NANOLUND INCOME FOR 2017**

Our funding comes from a wide range of national and international funding agencies. This ensures that our interdisciplinary environment has the necessary resources to conduct nanoscience research at the highest international standard.

The total income is evaluated as the income of members, weighted with their degree of participation in NanoLund.

NanoLund Incomes 2017 (MSEK)

- **Total Income**
  - **20** from European Union funding including ERC
  - **17** from other Swedish funding agencies (such as the Swedish Foundation for Strategic Research (SSF) and the Swedish Energy Agency)
  - **8** from other grants
  - **5** from companies
- **Sweden Council** 36
- **KAW** 36
- **Other Swedish Agencies** 17
- **Other** 8
- **Lund University support** 45
- **EU incl ERC** 20

**Euros**

- **194** total income, of which
  - **71** from the University and Strategic Research Area funding and
  - **123** is external funding won in competitive calls. Breaking down the individual contributions there is about
  - **36** from the Swedish Research Council (VR)
  - **35** from the Knut and Alice Wallenberg foundation (KAW)
  - **20** from EU H2020 funding including ERC
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**EUROPEAN FUNDING**

The NanoLund environment continues to apply for projects, individual funding, and to be active on a European level.

- **In 2017 members of NanoLund:**
  - **Include 8 ERC awardees**
  - **Participate in 14 EU projects**
  - **Coordinate 5 EU projects, and 1 Marie Curie Individual Fellowship**

**LIST OF FUNDING BODIES**

- The Swedish Research Council
- The Knut and Alice Wallenberg Foundation
- European Commission’s Research and Innovation Activities: European Research Council (ERC), Marie Skłodowska-Curie Actions, Horizon 2020 and FP7
- The Swedish Foundation for Strategic Research
- The Swedish Energy Agency
- AFA Insurance
- FORMAS
- The Crafoord foundation
- MISTRA
- Alzheimerfonden
- Barncancerfonden
- Carl Tryggers stiftelse för vetenskaplig forskning
- FÖRTE
- Fårs och Frosta Sparbank
- Finska videnskapliga fundem
- Hjälmfonden
- JUVESST
- KAM-Stiftelsen Korpstillsnans
- Magnus Bergslunds Stiftelse
- Parkinsonfonden
- Segerfalksfonden
- Sten K Johnssons stiftelse
- Stiftelsen Olle Engkvist Byggmästare
- STINT

A great big THANK YOU to those who fund our research!
NanoLund is a truly crossdisciplinary research center, engaging in total more than 300 scientists, teachers and staff from more than 20 divisions over three faculties - Engineering (LTH), Science and Medicine.

The NanoLund Management is led by an Executive Group with responsibility for day-to-day management and long-term planning. NanoLund is organized into six research areas:

- Materials Science
- Quantum Physics
- Nanoelectronics & nanophotonics
- Nanoenergy
- Nanobiology & nanoneuroscience
- Nanosafety

The scientific work is enabled and supported by three key resource areas, namely: Lund Nano Lab (LNL), Lund Nano Characterisation Labs (LNCL) and Nanoeducation.

Each research- and resource area has a coordinator and a co-coordinator, who have important roles in prioritizing activities and developing strategic aims.

NanoLund is headed by a Board, which defines strategy and makes formal decisions.

The center is advised by an international Scientific Advisory Board from society, academia and industry.

During 2016-2020 NanoLund works with the following long-term strategic aims:

**Highly controlled nanostructures**
To realize, model and characterize nanostructures, devices and systems with atom-level control.

**Fundamental science for future devices**
To discover fundamental physics, materials science and paradigms that may lead to future energy and ICT devices with enhanced performance.

**Tools for single-cell biomedicine**
To develop sensors, probes, stimulators and single-molecule methods for single- and few-cell biomedicine.

**A Great Place to do Nanoscience**
To be an internationally highly visible nanoscience center that offers exceptional scientific opportunities, training and career development.

**Nanomaterials industry**
To establish an ecosystem that integrates education, research, R&D and pilot production to take ideas from research to the marketplace.

2017 NanoLund Board Members:
- Viktor Öwall (Chair), Dean, LTH
- Ulf Karlsson, Professor, Linköping U.
- Frida Lindberg, Student rep.
- Heiner Linke, Director, NanoLund
- Sara Linse, Science faculty
- Camilla Modeer, IVA
- Stephanie Reimann, LTH
- Regina Schmitt, Student rep.
- Jens Schouenborg, Medical faculty
- Reine Wallenberg, LTH
- Tord Wingren, Huawei

2017 Executive Group:
- Heiner Linke (Director)
- Lars Samuelson (Vice-Director)
- Anneli Löfgren (Co-Director)
- Anders Mikkelsen (Co-Director)

2017 External Advisory Board:
- Camilla Modeer (Chair), IVA
- Ola Asplund, IF Metall
- Sarah Fredriksson, Genovis AB
- Peter Honeth, former State Secretary
- Ulf Karlsson, Linköping University
- Ilmar Reepalu, Region Skåne
- Tord Wingren, Huawei

Coordinator’s forum:
- Consists of Executive group (4), Chair of the Board
- Coordinators and co-coordinators of the subareas and resource areas
- Student representatives to the Board
INFO

This is the 2017 Annual Report for the NanoLund research environment at Lund University presenting scientific, educational, outreach and public impact highlights, progress, data and trends for and up to 2017.

This report is based on material and data compiled and edited by the staff of NanoLund, in particular:

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