



Vision

To be a world-leading research center that uses the unique opportunities offered by nanoscience and nanotechnology to advance fundamental science and to address societal grand challenges.

Mission

To bring together the most creative scientists, students and industry professionals in an interdisciplinary research environment to do cutting-edge research on the materials science, physics, chemistry and safety of designed functional nanostructures for sustainable energy, opto/electronics and life-science applications.



Background

HISTORY

NanoLund, the Center for Nanoscience at Lund University, was established in the year 2015 by agreement between the deans of the faculties of engineering (LTH), the sciences, and medicine at Lund University. NanoLund was founded on the basis of the Nanometer Structure Consortium (initiated in 1988), which – during 2010-2015 – formed the Strategic Research Area nmC@LU.

NANOLUND'S TASKS WITHIN LUND UNIVERSITY

The text of the decision to establish NanoLund identifies as the Center's task *to coordinate and strengthen nanoscience at the faculties of Lund University* by:

- Engaging in basic and applied nanoscience and nanotechnology;
- Developing and maintaining research infrastructure;
- Developing undergraduate and graduate education, integrated with research;
- Enhancing the visibility of nanoscience at Lund University;
- Facilitating innovation and utilization of nanotechnology;
- Providing a joint strategy for nanoscience at Lund University.

PURPOSE OF THE STRATEGIC PLAN

The purpose of this Strategic Plan is to guide the work of NanoLund during the period 2016–2020, and to define and communicate NanoLund's overarching strategy internally and externally.

The Strategic Plan also forms the basis for NanoLund's Operational Plan, which identifies and prioritizes strategic actions to be taken at all levels of the organization.

Together, the Strategic and Operational Plans guide budget prioritization and serve as a basis for evaluation of the subareas and NanoLund as a whole.

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NanoLund 2020

STRATEGIC PLAN FOR THE CENTER FOR NANOSCIENCE
LUND UNIVERSITY | 2016 – 2020



NanoLund's overarching aims

GRAND CHALLENGES

NanoLund aims to use nanoscience and nanotechnology to address societal challenges, such as:

A sustainable society based on renewable energy sources

Paradigms and technologies for efficient energy conversion, for example in solar cells and lighting, and for nanomaterial-based products that are sustainable and safe from a life-cycle perspective.

A pathway to the future information society

New physical concepts, smart materials, nanoscale devices and their heterogeneous integration to enable the internet of things, augmented reality, and quantum technologies.

Personalized medicine

Nano- and microstructures for biomedical research at the single-cell level and for fast point-of-care diagnostics, enabling targeted, individualized therapy.

A Swedish, nanomaterials-based industry

Translating research results into products and helping to create favorable conditions for a nanomaterials-based industry in Sweden.

STRATEGIC AIMS

- To realize, model and characterize nanostructures, devices and systems with atom-level control.
- To discover fundamental physics, materials science, and paradigms that may lead to future energy and ICT devices with enhanced performance.
- To develop sensors, probes, stimulators, and single-molecule methods for single- and few-cell biomedicine.
- To be an international, highly visible nanoscience center that offers exceptional scientific opportunities, training, and career development.
- To establish an ecosystem that integrates education, research, R&D, and pilot production to take ideas from research to the market place.

NANOLUND'S ROLE IN SOCIETY

NanoLund aims to contribute to the society at large by:

- Identifying and developing applications of nanoscience that are beneficial to society;
- Educating individuals to a high level of technical skill and scientific insight;
- Informing the public and decision makers about nanoscience;
- Developing technology and engaging with industry.

VALUE BASE

All successful organizations require a base of values that all parts of the organization can work toward. NanoLund has identified the following guiding principles:

A great place to do nanoscience

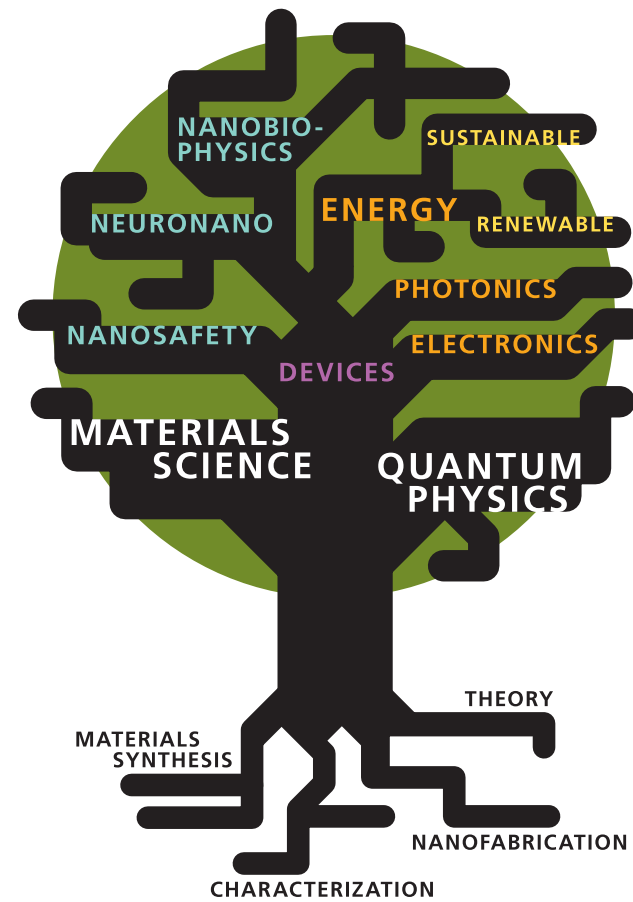
NanoLund aspires to be a creative environment that encourages collaboration, the sharing of knowledge and an open attitude, and that offers ideal opportunities for education and career development.

At the forefront of nanoscience

NanoLund aims to be at the forefront of establishing new research directions and contributing to thorough and high-quality nanoscience and nanotechnology at the international level.

Vertical integration

NanoLund aims to stimulate the interplay and mutual integration of education, basic and applied research, innovation, and commercialization.



Research

NanoLund aims to maintain a broad range of activities at a high level of excellence and scientific coherence in a diverse range of areas, and with clear and visible core competencies. To achieve this, we use a strategy illustrated by the tree above.

The tree's roots represent NanoLund's three core competencies, namely:

- Materials science enabling the synthesis of highly controlled semiconductor nanostructures;
- Quantum theory of phenomena in low-dimensional nanostructures;
- Processing and characterization of nanostructures.

The tree's crown represents our areas of active scientific research including materials science and quantum physics. Its branches include a broad range of dynamically growing areas of basic and applied research, with an emphasis on areas where NanoLund's unique devices and materials offer functionalities not available elsewhere in the world.

Our aim is to work, in each area, at the highest level of excellence. We achieve this by combining external collaborations with building critical mass and competence within NanoLund.

The key elements of this strategy are the ability to quickly create new internal and external collaborations; to shift resources toward promising new directions; and to end initiatives that do not prove successful.

In addition to the joint aims pursued by NanoLund and its subareas as a whole, the individual groups contributing to NanoLund also pursue individual research aims related to nanoscience. NanoLund aims to support the ability of its participating groups to work at the highest level of excellence by offering:

- Joint infrastructure for nanofabrication and characterization;
- Visibility;
- Venues, topical meetings, and workshops for interdisciplinary collaboration.

Infrastructure

To stay at the forefront of nanoscience and nanotechnology we are entirely dependent on state-of-the-art facilities for the fabrication and characterization of nanostructures. One of NanoLund's most important tasks is thus to build, maintain, and strategically develop shared infrastructure.

LUND NANO LAB (LNL)

LNL is Lund University's central open-user facility for nanofabrication with a focus on epitaxial growth and the pre- and post-processing of nanostructures and nanodevices. It is part of the national infrastructure Myfab and has the following aims:

- Within NanoLund: to provide the best possible nanofabrication resources for cross-disciplinary research at the international forefront and to facilitate the creation of new competencies and know-how.
- Within Lund University: to serve as the main nanofabrication center for Lund University researchers and to act as a showcase for multi-disciplinary research in nanotechnology.
- Within Myfab: to provide complementary resources in micro- and nanofabrication and characterization and to facilitate links with industry.

LUND NANO CHARACTERIZATION LABS (LNCL)

LNCL is a distributed infrastructure consisting of specialized equipment placed around campus. It aims to support instrumentation for the characterization of nanomaterials and devices to enable rational design with significantly enhanced properties. LNCL uses two main approaches:

- Increasing awareness of the possibilities that already exist within NanoLund and promoting unexplored combinations or collaborations.
- Identifying new, promising directions and providing targeted support for establishing or further developing those directions. The bottom-up approach via the grant system is mainly used, but even a top-down approach, using NanoLund funding, will be applied if some particularly promising direction should be advanced.

