June 2020

NanoLund Strategic Plan 2020- 2025

Our vision: To be at the Forefront of Nanoscience

Our vision is 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 challenges.

Our mission: To be a Great Place to do Nanoscience for the Nanotechnology of the Future

Our mission is 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, enabling important fundamental science and nanotechnology for the future.

Societal Challenges we aim to address

Enabling a sustainable society
Paradigms and technologies for efficient harvesting and use of energy, and for nanomaterial-based products that are sustainable and safe from a life-cycle perspective. Examples include solar cells based on non-toxic and abundant materials, energy storage, and reduction of pollution.

A pathway to the future information society
New physical concepts, smart materials, nanoscale devices, sensors and their heterogeneous integration to enable next-generation information technology, including alternative computation, such as quantum, neuromorphic and biological.

Precision medicine
Nano- and microstructures for biomedical research at the single-cell level and for fast point-of-care diagnostics, enabling targeted, individualized therapy. Examples include biomarker detection, recording of single neurons, and sorting and manipulating cells for diagnostic and therapeutic applications.

Interaction with business and society
Collaborate with the private and public sectors both locally and internationally to understand needs and translate research results as well as specialized methods into products, services and clinical applications. Jointly we can address sustainable development goals, help solve societal challenges, and create new industry.

Our strategic aims

In order to address societal challenges, we work with the following strategic aims:

1. **Building and understanding devices with atom-level control.** *To realize three-dimensional nanostructures, devices and systems with atom-level control, and to gain deep understanding of their physical, chemical, and/or biological interactions by modeling and characterizing them at all relevant length- and time scales*.

2. **Pioneering science.** *To make fundamental scientific discoveries that increase our understanding of the world and that form the basis for finding new paradigms and device concepts, for example based on quantum phenomena or on fluctuations in small systems.*
3. **Nanotechnology applications.** *To invent and engineer devices with enhanced performance and new capabilities for energy, ICT, sensing and diagnostics, building on safe use of advanced nanotechnology and on deep understanding of the underlying science.*
4. **A Great Place to do Nanoscience.** *To be an international, highly visible nanoscience center that offers exceptional scientific opportunities, training, and career development. To create state-of-the-art clean room facilities and space designed for close interactions within NanoLund, with scientists at Lund Laser Centre, MAX IV and ESS, and with students at all levels in Science Village.*
5. **Interaction with society.** *To be a leader in building an ecosystem that integrates education, interdisciplinary research, R&D, and private-public collaboration to exchange ideas and to promote innovation that improves our society.*

Sustainable Development Goals we aim to address

We are passionate about addressing the world's challenges, and we have identified a wide range of the United Nations' Sustainable Development Goals (SDGs) that our research helps address:

SDGs 3, 6, 10 and 14: Healthy lives, well-being for all, clean water, and equality. We develop knowledge and diagnostic tools that have the potential to help address infant mortality (3.2), reduce contagious (3.3) and non-contagious (3.4) diseases, and help ensure accessible health care (3.8) and equality (10). Our work on nanosafety aims to reduce risks for exposure to toxic materials (3.9) at the workplace and by reducing pollution (6.3, 14.1, 14.2). Effective water purification is an application of LED technology (6.1, 6.2).

SDG 7: Affordable and clean energy. A significant part of our materials development, as well as basic and device research, aim to increase the share of renewable energy (7.2) through increased energy efficiency (7.3) and enabling improved infrastructure (7b).

SDGs 8 and 12: Economic growth and sustainable production. We aim to create new nano-enabled products and industry sectors with a safe-by-design perspective addressing workplace safety (8.8), encouraging and enabling companies to adopt sustainable practices (12.6), including concerning waste generation (12.5) and management (12.4) with a life-cycle perspective (12.4).

Our role in society

We aim to contribute to the society at large by:

- Identifying and developing applications of nanoscience that make a positive impact on society and help address Sustainable Development Goals;
- Engineering new technology, engaging with industry, and translating results into products and clinical applications.
- Communicating about our research findings and about the societal impact and potential of nanoscience to the scientific community, the public and decision makers;
- Educating individuals to a high level of technical skill, scientific insight, ethical standards, and understanding of questions of sustainability;
- Contributing to diversity and gender equality through recruiting, mentoring and career development;
- Building on past investment, take new initiatives for long-term investments that will enable future breakthroughs;
- Performing excellent scientific research for the sake of scientific insight and for the benefit of society.

Our research environment

At the forefront of nanoscience
NanoLund shall be at the forefront of pioneering new research directions and contributing to high-quality nanoscience and nanotechnology at the international level.

A great place to do nanoscience
NanoLund aspires to be an open and creative environment that encourages collaboration, mutual inspiration and support, the sharing of knowledge and an open attitude, and that offers ideal opportunities for education and career development.

Coherent knowledge environment
As a Strategic Research Area, NanoLund is a cross-disciplinary knowledge environment that encompasses and integrates education, basic and applied research, innovation, and commercialization.

Who we are: our core values

Our core values represent our joint vision of the culture we wish to have for NanoLund, and our view on how we can achieve this culture through our individual actions. They serve as a guide in making small and large decisions.

Openness
To us, openness is about being inclusive and welcoming of diversity of people and ideas. We work toward a safe environment of mutual trust and respect in which we can share and freely exchange ideas and knowledge to bring out the best in each of us. Only by being open can we be a great place to do nanoscience.

Enthusiasm
To us, enthusiasm is about inspiring and driving each other to being at the forefront of nanoscience. We approach our tasks with positive energy and commitment, and we encourage and enable each other to overcome challenges.

Pioneering
To us, being pioneering is about combining creativity with resourcefulness and excellence to pursue impactful nanoscience and nanotechnology for the future. To advance fundamental science and to address societal challenges, we explore new approaches, select the most promising ones, and aim for deep scientific understanding.