

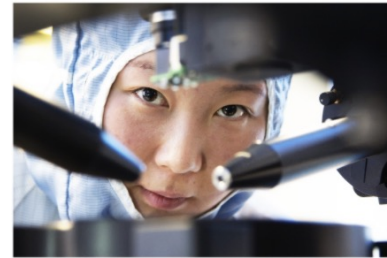
NANO LUND
AT THE FOREFRONT OF NANOSCIENCE

Lund Nano Lab

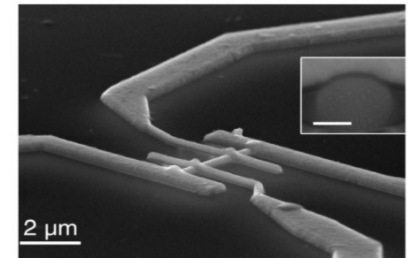
 myfab Lund Nano Lab

Lund Nano Lab 2022

- Part of **Myfab** – national research infrastructure for **micro and nanofabrication**.
- Staffed by 15 FTE (incl. 6 Ph.D.'s).
 - Fabrication, Characterization, Equipment
- 95 bookable tools in ISO 5/7 clean room
- 135 active users (academic and commercial)
 - 112 academic users, 3 institute users, 20 company users
 - 32 new users
- 100 Undergraduate students each year
- 36 000 hours tool time



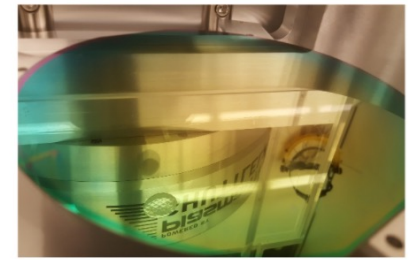
Metrology/Characterization



Lithography



Thin Films



Etching



Growth



Chemical Processing



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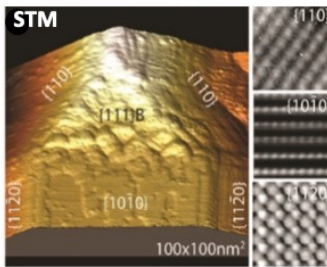
Lund Nano Lab

 **myfab** Lund Nano Lab

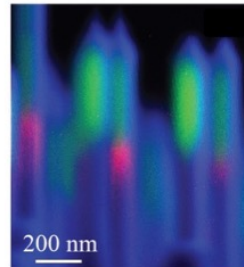
The role of the lab

Research

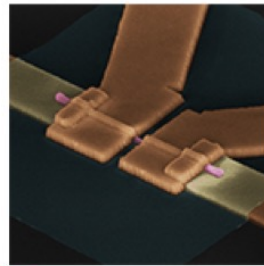
Materials science with atom-level control



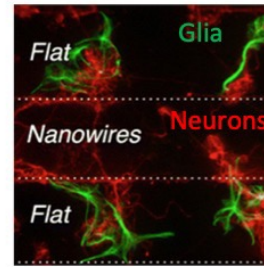
Quantum Optics and Nanophotonics



Quantum Transport and Nanoelectronics

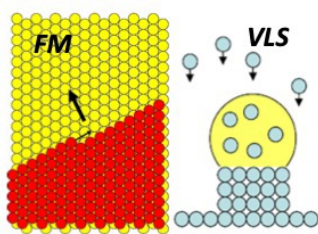


Bio-Medical Tools

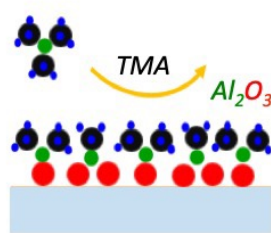


LNL Enabling Research

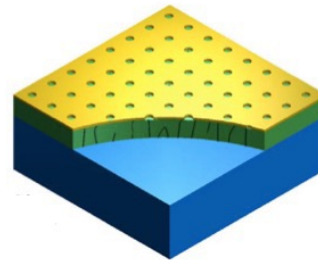
Lund Nano Lab



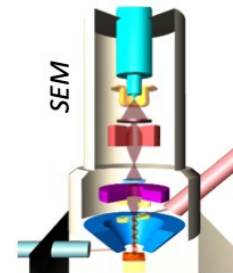
Growth



Deposition, Etching



Patterning



Characterization

Why do we need a new clean room?

- Enable more stable processes and better control
- Lack of capacity
 - Area in the clean room, the chases, gases and chemicals
 - Ventilation capacity
 - Electricity, cooling etcetera
- Clean room environment in the whole lab

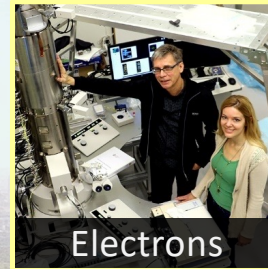
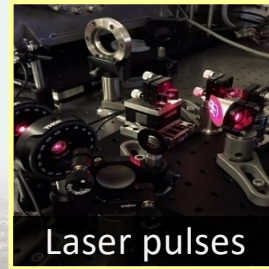
Aims

- State-of-the-art resources in nano and micro fabrication
- A sufficiently large and flexible lab space for the continued growth and dynamic developments
- Provide a world class teaching environment
- Be at the forefront within the area of compound materials for semiconductor devices.
- Be able to offer stable processes and high reproducibility
- Be a strong partner with MAX IV and ESS.
- Enable a significant utilization and collaboration with industry.
- Create easy accessibility for researchers, students, and external users.
- By design, to have inherently improved and safer infrastructure and logistics

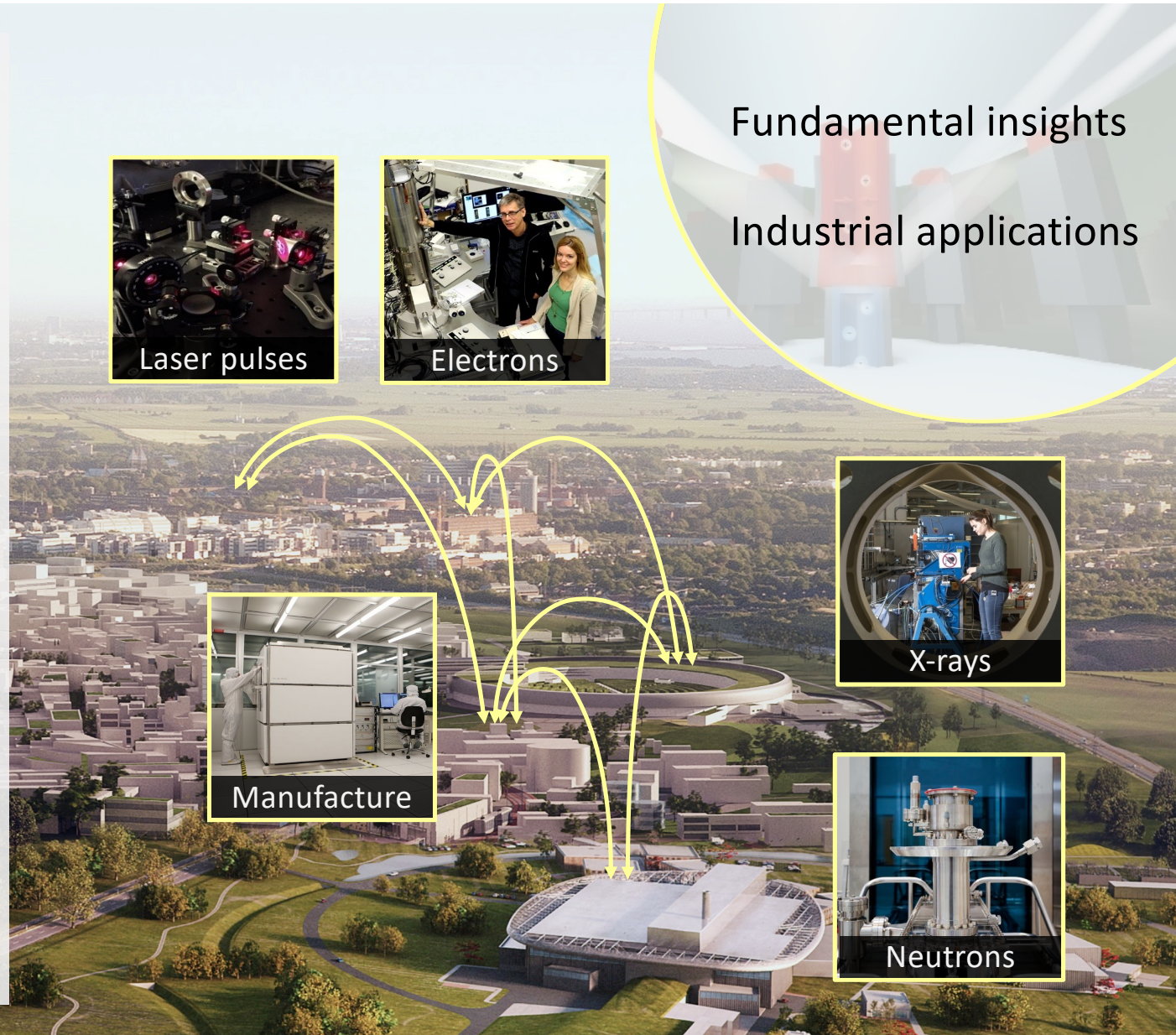
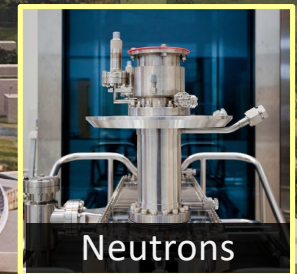
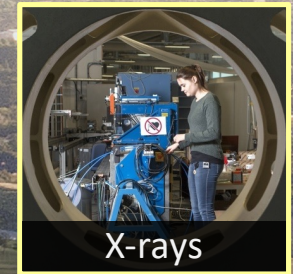


A cluster of infrastructures and an interconnected knowledge, competence and applications ecosystem.

Fabrication, characterization, learning and innovation within 10 minutes walking



Fundamental insights
Industrial applications



Nanolab Science Village – Background

- The need of a new cleanroom was identified already 2014
- An extension in connection to the current lab was investigated and planned for in 2015-2016 (Board of Dep. of Physics Feb 2015)
- During the spring 2016, the decision was taken to change direction and work towards a new cleanroom at Science Village instead (Dep. of Physics and LTH)
- Project plan and steering group formed by LTH and FoS 2021/2022
- May 2023: procurement of landlord launched
- According to the plan, the building of NanoLab Science Village could be finished 2028.



Next milestone on Lund University's road to Science Village: landlord wanted

4 May 2023

Work is now in progress on procuring a landlord who wants to be part of the development of Nanolab Science Village. This means another milestone for Lund University's establishment at the emerging Science Village – where the production of nanomaterials and semiconductor components will take place next door to the major research facilities ESS and MAX IV.

New phase of the project!



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NLSV – what is already done?

- Defining a good spot at Brunnshög
- Detailed specification of needs and Utility requirements
- Local plan (Detaljplan) approved in 2018
- Fundraising campaign for equipment
- Vice-chancellor decision about establishment at Brunnshög
- Cost estimate
- Decision to start the procurement process, procurement launched
- Interviews with different user groups
- Study visits and exchange of experience
- A lot of work with underlying documents



Strategic collaboration with the Olle Engkvist Foundation: 100 MSEK for Nanolab Science Village

Published 9 March 2023



The new collaboration with the Olle Engkvist Foundation is of strategic importance to Lund University's expansion in Science Village, says Vice-Chancellor Erik Renström.

NanoLund at Lund University has established a long-term strategic collaboration with the Olle Engkvist Foundation, which intends to support the purchase of equipment for Nanolab Science Village to the tune of SEK 100 million over five years.

Latest news



20 Apr 2023

Inexpensive spectrometer triggers

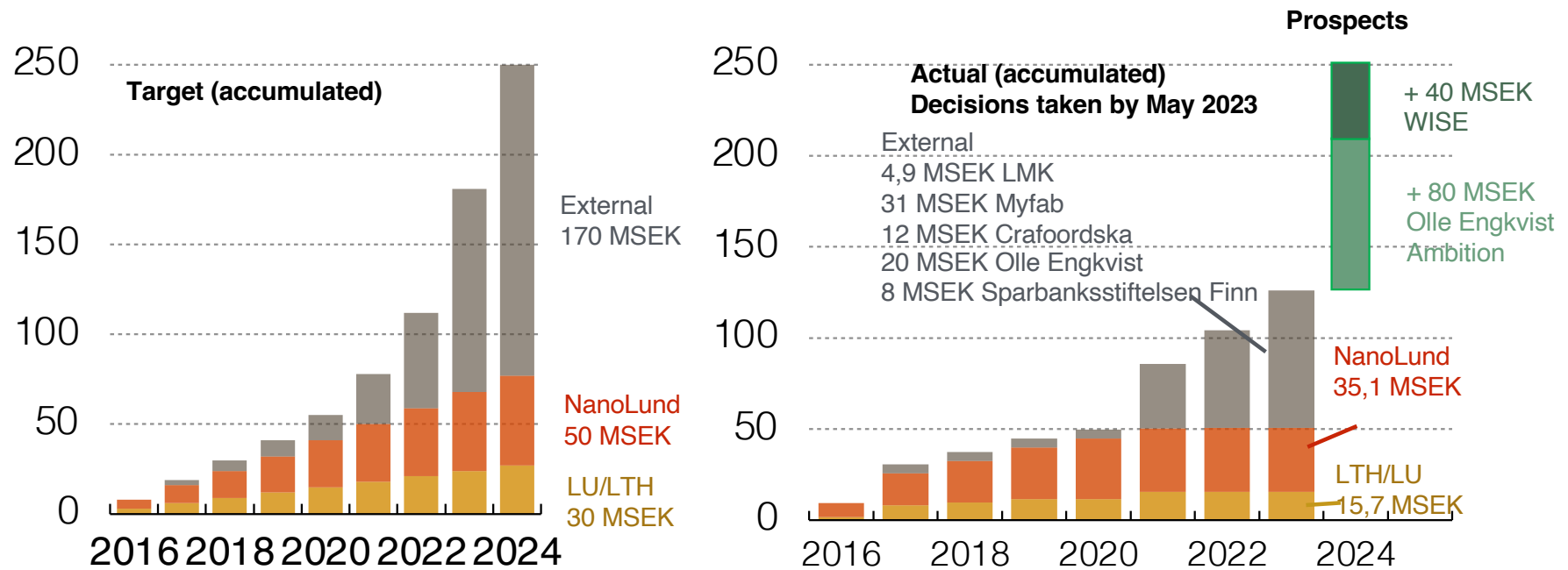
Fundraising for equipment



Aim from **2018**: Total promise of 250 MSEK until 2024, with 50 MSEK from NanoLund and 200 MSEK through proposals. External fundraising campaign initiated.

2020: Fundraising campaign prepared, starts to proceed into an active phase

Status May 2023: Granted last 12 months: 12 MSEK from Crafoord Foundation, 20 MSEK from Olle Engkvist Foundation, 8 MSEK from Sparbanksstiftelsen Finn

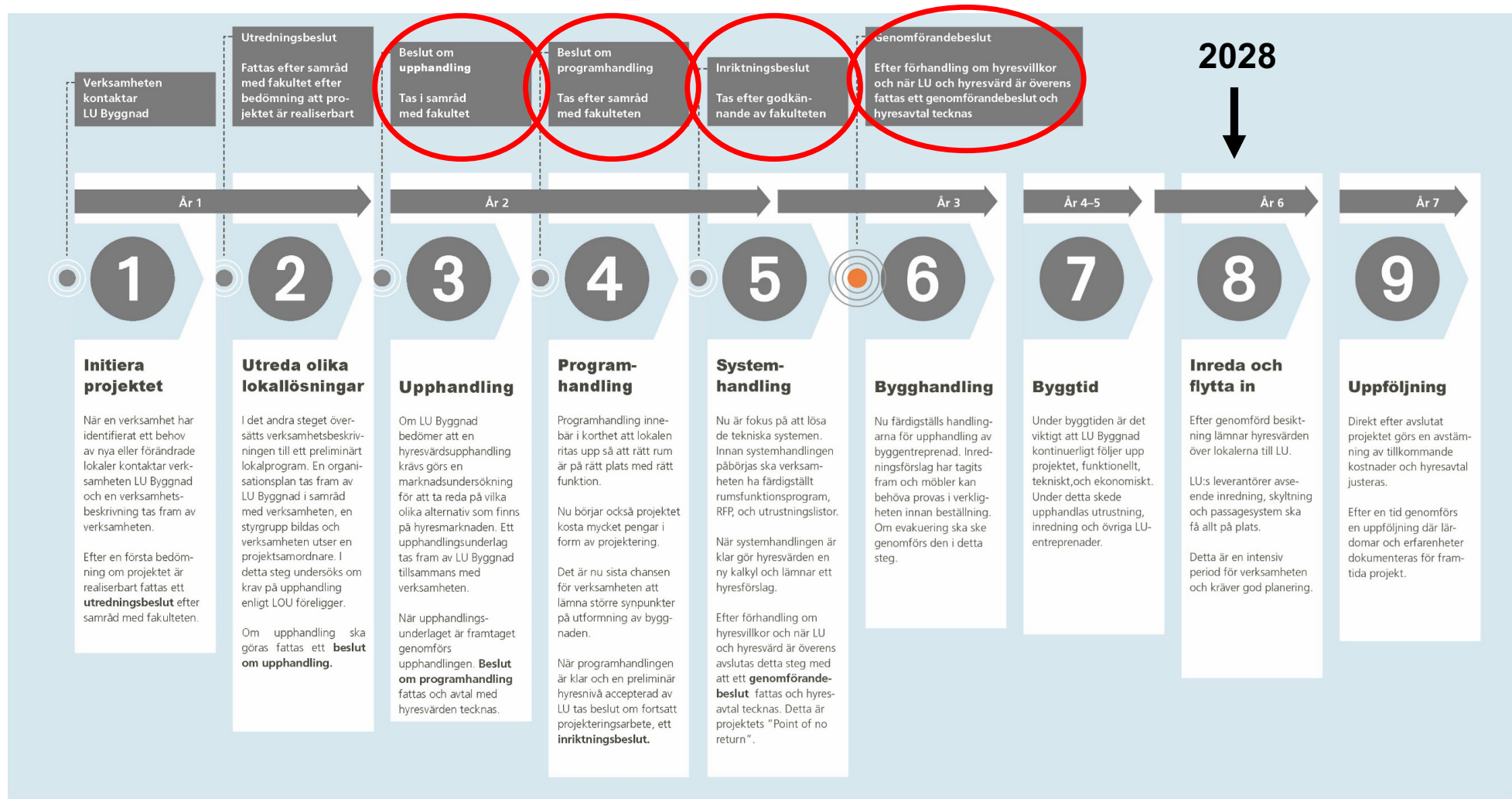


Procurement of a landlord

- Lund university is not allowed to own any buildings – rental required
- Open procurement of a landlord
 - Confidentiality
 - Unusual process within LU
 - Special concept for this project
 - Needs to be well described already at the announcement
 - Many questions that have been investigated
 - It has taken a very long time...



Process and time plan



NLSV – next steps

- Procurement process
- Set the organization
- Planning for the building and transition period
- Coordination with Phase 2



Organisation, Project Team and Contacts

- Anneli Löfgren (Project leader NLSV)
- Fredrik Österberg
- Luke Hankin (Head of Lund Nano Lab)
- Anders Kvennefors
- Håkan Lapovski
- Gunilla Ekman (LU byggnad)
- Caroline Edvaller (Procurement)

- **Steering group (LTH, FoS, Physics)**
- NanoLund, Div of Solid State Physics

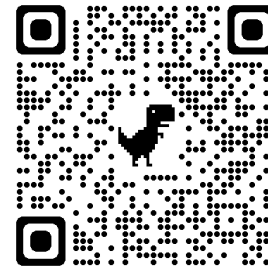
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Luke.Hankin@ff.lth.se

<https://lusciencevillage.blogg.lu.se>

<https://www.nano.lu.se/facilities/lund-nano-lab>

<https://lundnanolab.ff.lth.se>



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Summary

- Nanolab is a tremendous resource for Lund University that uniquely allows the fabrication and manipulation of samples with high precision at the nano/micro scale.
- Our successful fundraising, global trends that favors cleanrooms and combination of infrastructures and competence in Lund is a great opportunity!
- Our aim is that NanoLab and the future NLSV should be fully exploited efficiently and with maximum outcome in terms of scientific and societal output.



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