2025-08-19

Ansökan

2025-07396 Wernersson, Lars-Erik VR-EXCBT

Information om sökande

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Akademisk titel: Professor

Arbetsgivare: Lunds universitet

Information om ansökan

Utlysningsnamn: Bidrag för planering av framtida excellenskluster inom banbrytande tekniker 2025 (Vetenskapsrådet)

Bidragsform: Nätverksbidrag

Sökt inriktning: Banbrytande tekniker

Ämnesområde utlysning: NT, MH, HS, UV

Projekttitel: Avancerade Halvledare: Innovation, Testning och Värdekedjor

Projektstart: 2025-10-01

Projektslut: 2026-03-31

Sökt beredningsgrupp: VR-EXCBT

Klassificeringskod: 20299. Annan elektroteknik och elektronik, 50202. Företagsekonomi, 21003. Nanoteknisk materialvetenskap

Nyckelord: Semiconductor, Devices, Value chains, Failure testing, Responsible Internationalization

Medverkande

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Dr-examen: 2009-09-25
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Akademisk titel: Professor
Arbetsgivare: Chalmers tekniska högskola

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Arbetsgivare: Ingen nuvarande arbetsgivare

Projektinformation

Projekttitel (svenska)

Avancerade Halvledare: Innovation, Testning och Värdekedjor

Projekttitel (engelska)

Advanced Compound Semiconductors: Innovation, Testing and Value chains

Abstract och populärvetenskaplig beskrivning

Abstract (engelska)

Compound semiconductors *are critical for groundbreaking electronic innovations in* ***high-frequency systems, quantum applications, optoelectronics, and power electronics.*** *Sweden has a strong position forming our cluster embryo that we will strengthen by innovation-driven research and development, new advanced characterization, and research on the changes in the global ecosystem. The ambitious and innovative cluster research aims at strengthen Swedish position in semiconductors attracting international and industrial support.*

To realize our vision *we have identified knowledge gaps where collaborative research and networking is needed in the cluster. We integrate the international perspective with consideration of current geopolitical tensions and the associate policy development. The center combines complimentary semiconductor technical research excellence at Lund and Chalmers blended with advanced characterization using the international large scale infrastructure ESS and Max IV. Technical challenges include control of epitaxial process and interfaces, device perfection for state-of-the-art performance with new system concept demonstration. We further integrate research on innovation and combined, we will identify opportunities for Swedish semiconductor innovations in an international perspective.*

Populärvetenskaplig beskrivning (svenska)

Halvledare är en teknik i tiden och innvationer är nödvändiga för den gröna omställningen, energiutmaningen, digitaliseringen och för försvaret. Området är forskningsintensivt och nya material och komponentteknologier tillför banbrytande angreppssätt på samhällsutmaningarna. Spetsforskning inom området halvledare är avgörande för att Sverige ska kunna utveckla sin position som kunskapsnation och med ett internationellt perskeptiv har vi möjlighet att bäst utveckla våra unika styrkor.

Vi kombinerar fyra unika kompetenser inom halvledare i Sverige där varje partner bidrar med sin spets och där vi tillsammans kan beforska nya områden med potential att skapa en stark forskningsposition för halvledare i Sverige.

Lunds univeristet (EIT) bidrar med spetsforskning inom material och komponentteknologi primärt baserat på III-V halvledare. Avdelning och PI bidrar också med erfarenhet av att leda internationella forskningskonsortier och större nationella program och vetenskapliga miljöer. Aktiviteter kopplade till ERC och EIC är en bas i projektet.

Chalmers universitet bidrar med spetsforskning inom högfrekvensteknologi, komponentteknologi, och kretsdesign. Kompentes och projekt är komplettära med verksamheten i Lund.

ESS planerar att etablera en ny facilitet för testning av halvledarkomponenter. Verksamheten kommer att ge ny kunksap om komponenternas prestanda och materialens tålighet i kritiska miljöer. Genom den avancerade karaktäriseringen kommer vi att få bättre förståelse för materialens möjligheter och begränsningar vilket kommer att leda till ökad konkurrenskraft för svensk forskning och industri.

Lunds universitet (LUSEM) birdrar också med en kraftsamling relaterat till innovation, företagspolicy, och internationella sammarbeten i vår föränderliga omvärld. Kunskapen kommer att vara viktig för att positionera svensk forskning i ett internationellt perspektiv och bygga en starkt och hållbar vetenskaplig miljö.

Beräknad projekttid

2025-10-01 - 2026-03-31

Planerad användning av forskningsinfrastruktur

Planerad användning av forskningsinfrastruktur

Ja

Forskningsinfrastruktur/er

MAX IV-laboratoriet

Myfab - The Swedish Research Infrastructure for Micro and Nano Fabrication

Annan forskningsinfrastruktur

ESS

Övriga ansökningar och bidrag

Är någon eller flera av punkterna aktuella för dig?

Ja

Motivering och redogörelse för relationen mellan de olika projekten och/eller ansökningarna (engelska)

PI har projektbidrag från VR.

Planering för användning av bidraget

Planering för användning av bidraget (engelska)

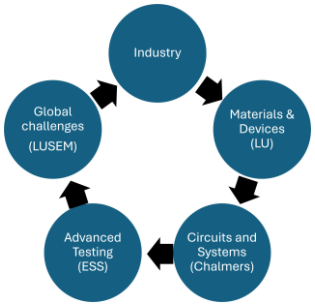
Se nästa sida för bilaga.

Advanced Compound Semiconductors: Innovation, Testing and Value chains

Compound semiconductors are critical for groundbreaking electronic innovations in high-frequency systems, quantum applications, optoelectronics, and power electronics. They enable advanced sensing, communication, and energy harvesting technologies. Sweden has a strong position forming our cluster embryo that we will strengthen by innovation-driven research and development, new advanced characterization, and research on the changes in the global ecosystem. The ambitious and innovative cluster research aims at strengthening Swedish position in semiconductors attracting international and industrial support.

Description of the Research Area:

We propose a cluster building on the research excellence in compound semiconductors (materials, devices, integrated circuits) at Lund and Chalmers university. This research has demonstrated strong competitiveness, attracting both national and European funding. We start from ERC-funded AdG projects with the aim to add translational research to drive innovations towards the market. We will integrate research on the innovation system and global aspects as well as a dedicated characterization effort. The planning grant will be used to a) further develop and broaden the project portfolio and integrate of PIs, b) detail the plan for failure testing at ESS, and c) outline the strategy for research on the global market development.



The complimentary partner contributions.

To describe the strategic technology and to illustrate the innovation opportunities for compound semiconductors, we provide a few examples of visionary and groundbreaking research:

Reconfigurable RF-electronics: Integration of ferroelectric materials in III-V transistor platforms is a novel approach to enable capacitance tuning suitable for frequency and bandwidth modulation in the sub-THz frequency range[1]. The approach builds on detailed knowledge about ferroelectric materials and their integration including switching dynamics and endurance[2]. Interfaces and defect distributions are essential demanding detailed process control. Applications in security system are envisioned.

Earth and Space observations: Satellite-based remote sensing of the atmosphere in the millimeter and submillimeter wavelength range is essential for weather prediction and understanding the physical and chemical processes behind climate change[3]. Space observation (radio astronomy) is a vital tool for exploring the universe and our origin. New electron device concepts based on disruptive compound semiconductor technology are crucial to reduce the device noise contribution to enable these applications.

Wireless communications: The ever-increasing demand for data rates necessitates the use of the terahertz spectrum[4]. Toward this goal, we envision combining new devices and material concepts that enable wide-band transmitter and receiver circuits for short-range and ultra-high-speed data links. Heterogeneous integration of compound semiconductors is a crucial enabler, and research on low-noise (narrow bandgap), high-power (wide bandgap) device technologies for future terahertz electronics is essential.

Energy harvesting in space[5]: The opportunity to form triple junction heterostructures in III-V materials open the path for light absorption over a wider spectrum range opening the path for increased efficiency targeting 40%. Nanowires peeled off from the substrate reduces the weight of the solar panel, what is essential for space applications. Combined with wireless power transmission, such systems provide new opportunities for self-powered space and satellite missions. For efficient power transmission, III-V technology is optimal. Research challenges include surface passivation schemes, power efficiency and system design aspects.

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[1] A.Persson, et al, RF Characterization of Ferroelectric ... IEEE Electron Device Letters 45, 1653 (2024)
[2] Z. Zhu, et al ...Reconfigurable Signal Modulation .. Nature Communications 14, 2530 (2023)
[3] P. Eriksson et al. The Arctic Weather Satellite .., https://doi.org/10.5194/egusphere-2025-1769, 2025
[4] I. Dan, et al, A Terahertz Wireless Communication ..., IEEE Trans. Terahertz Sci. Technol.,10, 32 (20209
[5] ZEUS project funded by European Innovation Council 2024

Cryogenic neuromorphics for quantum and space: Integrating memory close to qubits allows efficient ML to compensate for variations in the quantum state environment, and in space to adjust the energy beam directivity from antenna arrays. Integration of memory elements on the top of a vertical transistors in a $4F^2$ configuration combines the advantages of the selector and vertical memory element stacking, in low-latency configuration[6]. Key advantages include the low-bias operation and temperature stability of the compound semiconductors reducing power and simplifying circuitry.

Advanced testing and characterization Failure analysis and life-time testing are required when validating new semiconductor technology and to accelerate the life-cycle, high intensity radiation is preferred to emulate harsh environments and failure processes. Testing of new devices and materials at an early stage, generates knowledge on material compatibility required for contribution to the value chain. Both Max IV and ESS have unique opportunities for material and device characterization also including critical interfaces in heterogeneous integrated systems. In addition, we will utilize and further develop the electrical characterization facilities (DC and micro- and millimeter wave) at the two universities.

Network description and mode of cooperation - Bridging the knowledge gap?

To realize our vision *we have identified knowledge gaps where collaborative research and networking are needed in the cluster. We integrate the international perspective with consideration of current geopolitical tensions and the associated policy development. The center combines complementary semiconductor technical research excellence at Lund and Chalmers blended with advanced characterization using the international large-scale infrastructure ESS and Max IV. Technical challenges include control of epitaxial process and interfaces, device perfection for state-of-the-art performance with new system concept demonstration. We further integrate research on innovation and combined, we will identify opportunities for Swedish semiconductor innovations in an international perspective.*

Geopolitics, political economy, and innovation management: Lund University School of Economics and Management (LUSEM) contributes critical interdisciplinary perspectives that will be combined with the technical research. Through four interconnected research themes, LUSEM will contribute to both the scientific and societal relevance of the initiative.

Firstly, LUSEM explores meso- and macro-level geopolitical and industrial policy dimensions. This research analyses how Europe's semiconductor aligns with the EU's strategic autonomy goals, evaluates the European Chips Act's impact, and identifies Sweden's role within global value chains. It also addresses critical factors, including skilled workforce availability, environmental sustainability, and strategic diplomatic relationships affecting international competitiveness. The effort will balance well technical research in various European programs.

Secondly, LUSEM guides the investigation of strategic leadership and governance of interdisciplinary technology projects within innovative organizations. This area focuses on effective leadership models, governance structures, and coordination mechanisms facilitating successful collaboration between academia and industry. It emphasizes the integration of specialized knowledge to enhance innovation capacity within complex, interdisciplinary research settings. The academic-industry collaborations will provide input and experience.

Thirdly, LUSEM leads an exploration of entrepreneurship, innovation, and commercialization strategies. This research investigates effective firm-level processes, regional innovation ecosystems, and national frameworks essential for leveraging opportunities presented by AI, automation, green technologies, and sustainable manufacturing. By providing insights into regional resource networks, skill development, and policy implications, the project will strengthen regional innovation and technology transfer.

Finally, LUSEM addresses micro-level organisational dynamics under uncertainty. This research will explore strategic decision-making processes and organisational practices necessary for managing disruptions and fostering innovation. Employing surveys and detailed

[6] MS Ram, et al, High-density logic-in-memory devices ... NATURE ELECTRONICS 4, 914 (2021)

ethnographic studies, the project aims to deepen understanding of leadership capabilities and organisational resilience in complex, uncertain technological environments.
Together, these contributions from LUSEM provide comprehensive, multi-level insights essential for addressing barriers and capitalising on opportunities within emerging semiconductor technologies as outlined in the cluster proposal.

A new advanced testing platform for semiconductor research will be established and used by the cluster, leveraging the unique co-location of the European Spallation Source (ESS) and MAX IV Laboratory. At the heart of this initiative is the ECHIR instrument at ESS, a fast neutron irradiation facility designed to simulate cosmic-ray-induced effects on semiconductor devices. This facility addresses a critical gap in Europe's semiconductor infrastructure, where only one comparable instrument, ChipIr at ISIS, currently exists, and demand far exceeds capacity.
The proposed ECHIR instrument will enable accelerated testing of Single Event Effects (SEEs), which are crucial for ensuring the reliability of microelectronic and power devices in terrestrial and avionic environments, within and beyond the cluster. Its neutron spectrum is comparable to that of ChipIr, but with an order of magnitude higher intensity, allowing for faster and more sensitive testing. This capability is vital as devices become increasingly radiation-sensitive and as the European semiconductor industry scales up in response to the European Chips Act. The facility also supports testing for high-radiation applications such as particle detectors for the LHC and FCC, and instrumentation for advanced nuclear reactors.
International industry commitment is strong. Companies such as Infineon and ST Microelectronics, alongside emerging players in space and nuclear technologies, have expressed support for ECHIR. The facility promises to make SEE testing a routine part of semiconductor development, enabling faster innovation cycles and supporting the development of international standards for radiation tolerance. Its high flux and large-area capabilities allow testing of complex systems, such as aircraft avionics, in realistic conditions.
The development of the ECHIR beamline at ESS benefits from a uniquely favourable starting position: the necessary modifications to the ESS target station, such as the fast neutron channel, shielding provisions, and beam dump infrastructure, have already been implemented during the early construction phase. As a result, the completion of the facility would require only a modest additional investment in shielding, control room and sample automation of estimated ca. 35MSEK, at 10–20% of the cost of a full-scale neutron instrument. ECHIR can be realised swiftly and cost-effectively, offering immediate value to both academic and industrial users from as early as 2028 without interfering with the ESS's operational roadmap.
Beyond ECHIR, MAX IV and ESS together offer a dozen instruments relevant to semiconductor research across all Technology Readiness Levels (TRLs). These include at the fundamental end the BLOCH beamline for band structure analysis[7] and NanoMAX for nanometre-resolution imaging[8]. The newly funded TomoWISE beamline, part of the Wallenberg WISE initiative will provide high-resolution 3D tomography, enabling characterisation of individual transistors within large chip structures[9].
Applying these new characterization techniques to the novel technology within the cluster will provide a cutting edge advantage with a deeper understanding on materials and device operation in harsh environment such as space.

Naturally, the challenging technical research will be at the forefront in generating new semiconductor applications and we will use our combined expertise to explore materials synthesis, device technology and system design for application implementation. We will apply our knowledge in epitaxial growth into new emerging materials like ultrawidebandgap AlN but also narrow gap materials, building on the long legacy of MOVPE at Lund university. Process flows will be established to fabricate devices with state-of-the-art metrics delivering performance on the targeted application scenarios and to generate a deeper understanding

[7] Karakachian, H et al Periodic Nanoarray of Graphene pn-Junctions ..Adv. Func. Mat., 32(18) 2022.
[8] Zhang, Y., et al. Measuring residual stresses in individual… Applied Physics Letters, 124(8). 2024
[9] Aidukas, T.,et al High-performance 4-nm-resolution X-ray tomo…. Nature, 632, 81–88. 2024

of the material properties. Heterogeneous integration technologies[10] will be introduced using a pick-and-place approach. One key aspect is to establish a compound semiconductor process platform within MyFab utilizing strengths at Chalmers and Lund university.

Forms for collaboration *T*he main vision for the excellence cluster is to develop word-leading research on compound semiconductors of relevance to the scientific community, industry and society. To achieve the goal, the excellence cluster will jointly work on a number of common research and policy questions. Combined they form the long-term strategy for the ground-breaking technology within the excellence cluster:

- *Establish unique device technology* contributing to the international development and putting Sweden on the international arena. One key point is to establish process flows using the best technology available at either partner within MyFab and identifying gaps in equipment and process technology. Equipment needs include dedicated deposition (sputters) and etching systems, heterogeneous integration pick-and-place tools, as well as increased redundancy for lithography. Already today, Lund and Chalmers are jointly active in the pilot-line funded by Chips-JU and Vinnova. The device and circuit characterization infrastructures at Lund and Chalmers need to ensure the capability to perform application-relevant characterization, requiring continuous activity on updating test equipment in terms of, for example, frequency and power ranges.
- *Enabling specialized characterization at ESS* for device testing. The effort will generate key knowledge and it will bring Sweden a stronger position at the ESS infrastructure.
- *Obtain critical mass* to attract international interest and funding. By working together in the cluster, we increase our international visibility and will be able to scientifically and technically compete with leading international efforts. Already today Lund and Chalmers are active in international conference organization in Sweden (CSW 2024, ICNS 2025, EUMW 2028)
- *Provide long-term funding stability* to address larger and more complex research questions related to technology and economic and societal impact. Semiconductor research relies on infrastructure investments, and long-term stability is essential in the international competition. by exploring different funding avenues, including investments and competitiveness funds and business models beyond funding through research grants. Provide knowledge and information on policy documents to Swedish decision makers, and feed to the EU research funding process. As members of the SCCC - Swedish Chips Competence Center, LU and Chalmers are already part of the EU **Chips for Europe Initiative** (European Chips Act) through the Chips Joint Undertaking. Thus, they are part of the EU consultation process for research funding.
- *Engage with national and international industry*. The strength of the cluster will allow us to expand and strengthen engagement with industrial partners.
- *Further develop Swedish competitiveness* by integrating research and education for next generation system designers.

Governance: During the planning phase, we will establish the governance structure for the excellence cluster. It will consist of a board, a stakeholder forum with connections to MyFab, branch organizations, industry etc. An international advisory board will further be included.

Building the Team: The PIs form the core group to which we will add further competence and networks. Potential candidates include Prof. Lind (device technology), Prof. Timm (structural characterization), Prof. Darakchieva (semiconductor materials), Prof. Rorsman (devices) Prof. Borgström (III-V epitaxy), Pia Kinhult, (Head of Host States Relations at ESS), M Nilsson (LUSEM). For the administration we will use support for Lund university collaboration and innovation offices. The project will be placed at Lund university Semiconductor Office at Science Village, Lund.

[10] A. Malko, et al, A 474 GHz HBV Frequency Quintupler .., IEEE Trans. Terahertz Sci. Technol., 5, 85 (2015)

Beskrivning av meriter

Meritbeskrivning (engelska)

The group of PIs has ample of experience in various forms of leadership includng academic research, institutional organisation, industry collaboration and tech-transfer, internatinal project management and policymaking. These are all aspects that will be critical in establishing a world leading reserch environment.

The PIs have strong academic track-records including **ERC-funding (AdG)**, **international recognition** (invited talks, conference organisation), **student tutoring** (number of phD students graduated), **mentorship of young researchers**, and **publications** in relevant journals to the field of study. The academic merits form the basis for the planned excellence cluster.

Several **spin-out companies** are formed based on the research by the PIs and we have experience from serving as board members. We further collaborte with major Swedish companies, SMEs and scale-ups via **Vinnova competence centers** (ACT coordinated by PI) providing experience in tech-transfer.

The PI has for three years collected all major Swedish players for **round-table discussions related to Semiconductors** including provided joined input to the Swedish research and Innovation Bill from three major univeristies (Lund, Chalmers and KTH).

Building research environments: In 2011 the PI moved into a new department at Lund Univeristy establishing a new line of research, an effort that today is the basis for a complete division within the department.

The PI has succesfully been i**nternational coordinating** two major Horizon 2020 and Horizon Europe EU projects (Insight and Sequence) with major European players indlucing Fraunhofer, LETI, IBM etc. Strong links to European and international academic and industrial partners are established.

The PI has served three years as **Vice Prefect** at Electrical and Information Technology department at Lund Univerity.

The PI has been coordination one very valuable **NT-forskningsmiljö in Lund (Electronics beyond kT/q) bridging device research and structural characterization at Max IV**.

Sökandes publikationer och andra forskningsoutputs (engelska)

Se nästa sida för bilaga.

Wernersson Publications

Publications Wernersson

M. K. Ram, H. Dahlberg, L.-E. Wernersson *Cryogenic Ferroelectricity of HZO Capacitors on a III–V Semiconductor* IEEE Electron Device Letters, 45, 1827 (2024)

The work demonstrates cryogenic operation of ferroelectric HZO on InAs with a pulsing scheme applicable to maintain a high polarization at low T. It is a first demonstration for the cryo-memory and was part of the ERC AdG Dynamism.

G. Rangasamy, Z. Zhu and L. -E. Wernersson, *High Current Density Vertical Nanowire TFETs With I_{60} > 1 μA/μm*, IEEE Access, 11, 95692 (2023)

Record high current levels are measured for TunnelFETs with subthermal operation. The work shows the strong experience in compound device technology at Lund university in a very competing and challenging field where our results stand out.

Z. Zhu, A. Persson and L.-E. Wernersson *Reconfigurable Signal Modulation in a Ferroelectric Tunnel Field-Effect Transistor* Nature Communications 14, 2530 (2023)

Anti-ambipolar operation of a gated tunneldiode with ferroelectric gate stack is used to operate as a pass transistor or a frequency doubler with high efficiency dependent of the bias configuration. It is a unique structure that also has been used for and published as in-memory computing applications.

Z. Zhu, A. Persson and L.-E. Wernersson *Sensing single domains and individual defects in scaled ferroelectrics* SCIENCE ADVANCES, 9, 7098 (2023)

Tunneling IV spectroscopy is applied to demonstrate the digital operation of individual grains in a ferroelectric film under pulsed bias operation.

MS Ram, KM Persson, A Irish, A Jonsson, R Timm, LE Wernersson, *High-density logic-in-memory devices using vertical indium arsenide nanowires on silicon* NATURE ELECTRONICS 4, 914 (2021)

A logic 4F2 square memory element is demonstrated and its performance evaluated. The cell integrates a RRAM memory element with a nanowire transistor acting as a selector. Key advantages include reduced area, reduced power consumption and decreased latency. The structural characterization at interfaces are essential.

Z. Yong, K.-M. Persson, M. S. Ram, G. D'Acunto, Y. Liu, S. Benter, J. Pan, Z. Li, M. Borg, A. Mikkelsen, L.-E. Wernersson, R. Timm *Tuning Oxygen Vacancies and Resistive Switching Properties in Ultra-Thin HfO2 RRAM via TiN Bottom Electrode and Interface Engineering* Applied Surface Science, 551 (2021)

Structural characterization using synchrotron-based XPS measurements are correlated with electrical measurements for RRAM structures identifying how processing conditions can be used to tailor the interface properties and consequently the memory element.

S. Andrić, L. O. Fhager, and L. -E. Wernersson *Millimeter-Wave Vertical III-V Nanowire MOSFET Device-to-Circuit Co-Design* IEEE TRANSACTIONS ON NANOTECHNOLOGY 20 434 (2021)

A co-design strategy is presented for III-V MOSFETs with optimization of the LNA noise and power performance.

O.-P. Kilpi, M. Hellenbrand, J. Svensson, A. Persson, R. Wallenberg, E. Lind, L.-E. Wernersson *High-Performance Vertical III-V Nanowire MOSFETs on Si with gm > 3 mS/μm* IEEE Electron Dev. Lett., 41, 1161 (2020)

The work demonstrates a very high transconductance of the III-V MOSFETs at scaled gate-lengths. The work is essential as it demonstrates the capability to implement transistors with very competitive performance using MyFab processing.

L. Fhager Ohlsson, S. Heunisch, H. Dahlberg, A. Evertsson, L.-E. Wernersson *Pulsed Millimeter Wave Radar for Hand Gesture Sensing and Classification* IEEE Sensor Letters 3, 3502404 (2019)

Gesture control is demonstrated using a short range pulsed radar fabricated in-house. Training a ML network, the gestures can be identified with >95% accuracy.

Wernersson Publications

Journal publications

70. Z. Zhu, K. Ram, A. Persson, L.-E. Wernersson *Low-Frequency Noise in Ferroelectric III-V Vertical Gate-All-Around FETs* IEEE Electron Device Letters, 46, 751 (2025)
69. H. Dahlberg, O. Kaatranen, K.-M. Persson, A. Rantala; J. Flak, L.-E. Wernersson *Memory State Dynamics in BEOL FeFETs: Impact of Area Ratio on Analog Write Mechanisms and Charging* IEEE ACCESS, 13, 9923 (2025)
68M. Ram, K. Ram, L.-E. Wernersson, *Cryogenic Evaluation of Resistive Random Access Memory With Enhanced Endurance at 14 K* IEEE TRANSACTIONS ON ELECTRON DEVICES, 72, 678 (2025)
67. Z. Zhu, A. Persson, L.-E. Wernersson *Multifunctional Reconfigurable Operations in an Ultra-Scaled Ferroelectric Negative Transconductance ..* ACS Nano 18, 28977 (2024)
66. M. K. Ram, H. Dahlberg, L.-E. Wernersson *Cryogenic Ferroelectricity of HZO Capacitors on a III–V Semiconductor* IEEE Electron Device Letters, 45, 1827 (2024)
65. A Krishnaraja, Z. Zhu, J. Svensson, L.-E. Wernersson, *III-V heterostructure tunnel field-effect transistor operation at different temperature regimes* APPLIED PHYSICS LETTERS, 125 193501 (2024)
64. A.Persson, S. Andric, L.-E. Wernersson, *RF Characterization of Ferroelectric MOS Capacitors* IEEE Electron Device Letters 45, 1653 (2024)
63. Z. Zhu, A. Persson, and L.-E. Wernersson *A Reconfigurable Ferroelectric Transistor as An Ultra-Scaled Cell for Low-Power In-Memory Data Processing* Advanced Electronic Material 2400335 (2024)
62. G. Rangasamy, Z. Zhu, L. Fhager, L.-E. Wernersson, *TFET Circuit Configurations Operating Below 60 …* IEEE TRANSACTIONS ON NANOTECHNOLOGY, 23, 441 (2024)
61. G. Rangasamy, Z. Zhu and L. -E. Wernersson, *Source Design of Vertical III–V Nanowire Tunnel Field-Effect Transistors*, IEEE Journal on Exploratory Solid-State Computational Devices and Circuits,10, 8 (2024)
60. K. Cherkaoui, P. La Torraca, J. Lin, N. Maraviglia, A. Andersen, L.-E. Wernersson, A. Padovani, L. Larcher, P Hurley, *High-k/InGaAs interface defects at cryogenic temperature* SOLID-STATE ELECTRONICS, 207, 108719 (2023)
59. S. Ram, J. Svensson, and L.-E. Wernersson *Effects of Interface Oxidation on Noise Properties and Performance in III–V Vertical Nanowire Memristors* ACS Applied Materials & Interfaces 15, 19085 (2023)
58. A. Krishnaraja, Z. Zhu, J. Svensson, L.-E. Wernersson, *Low-Power, Self-Aligned Vertical InGaAsSb NW PMOS …*IEEE ELECTRON DEVICE LETTERS 44, 1064 (2023)
57. G. Rangasamy, Z. Zhu, L. O Fhager and L. -E. Wernersson *gm/Id Analysis of vertical nanowire III-V TFETs* Electronics Letters 59 (2023)
56. S. Benter, A.Jönsson, J. Johansson, L. Zhu, E. Golias, L.-E. Wernersson, A. Mikkelsen. *Geometric control of diffusing elements on InAs semiconductor surfaces via metal contacts*. Nat Commun 14, 4541 (2023)
55. G. Rangasamy, Z. Zhu and L. -E. Wernersson, *High Current Density Vertical Nanowire TFETs With I_{60} > 1 μA/μm*, IEEE Access, 11, 95692 (2023)
54. G. Rangasamy, S. Ram, L. O Fhager and L. -E. Wernersson *Self-Heating in Gate-All-Around Vertical III-V InAs/InGaAs MOSFETs* IEEE Electron Device Letters, 44, 1212 (2023)
53. Z. Zhu, A. Persson and L.-E. Wernersson *Reconfigurable Signal Modulation in a Ferroelectric Tunnel Field-Effect Transistor* Nature Communications 14, 2530 (2023)
52. Z. Zhu, A. Persson and L.-E. Wernersson *Sensing single domains and individual defects in scaled ferroelectrics* SCIENCE ADVANCES, 9, 7098 (2023)

2022

51. R. Athle, T. Blom, A. Irish, A. Persson, L.-E. Wernersson, R. Timm, M. Borg *Improved Endurance of Ferroelectric HfxZr1-xO2 Integrated on InAs Using Millisecond Annealing* Advanced Materials Interfaces, 9, 2201038 (2022)
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Se nästa sida för bilaga.

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PUBLICATIONS AND OTHER RESEARCH OUTPUTS

Selection of research outputs relevant to the proposed project

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List of publications

Selection of ten publications, original articles

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Publications

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Motivering av sökt budget

Motivering av sökt budget (engelska)

The project consists of four different partners all contributing with different strengths and they will have different roles in the project.

Lund University School of Economics and Management (LUSEM) contributes critical interdisciplinary perspectives including meso- and macro-level geopolitical and industrial policy dimensions. This research analyses how Europe's semiconductor sector aligns with the EU's strategic autonomy goals, evaluates the European Chips Act's impact. Responsible internationalization is a further contribution.
Chalmers will contribute with experience and know-how in high-frequency technology and applications as well as system design. Infrastructure will be available both in the processing cleanroom within MyFab and the advanced characterization lab (Kollberg laboratory). A number of projects and centers are associated including one ERC AdG.

ESS will use the resources to outline the detailed plan for the installation of the EHCIR equipment and with a time line for the installations and the sample testing. The key will be to understand failure mechanisms in harsh environments.

Lund Univeristy (Electro and Information technolgy, EIT) coordinate the project, provide experience from national round table discussions on semiconductor in Sweden, and contribute with material and device technology. The effort is embedded in a number of major grants with strong experience from European coordination and includes one ERC AdG.

The budget will be divided among the partners:

Lund Univeristy (EIT) will receive 600 ksek för project coordination, arrangement of 2 workshops (one internal and one external), formulation of the report, further engegement with key international partners to be correlated in the cluster, networking with national stakeholders (industry and society including Regions, Svensk Elektronik, institutes, university management and leadership, etc).

Lund University (LUSEM) will receive 200 ksek for contribution to the report, participating in the workshops, further engegement with international aspects.

Chalmers Univeristy will receive 200 ksek for contribution to the report, detailing the investment needs for process and characterization technolopgy, participating in the workshops, internationalization and educational aspects.

European Spalation Source will receive 200 ksek for outlining the ECHIR installation and the associated national and international user network. The partner will contribute to all other aspects as well.

CV

CV - Lars-Erik Wernersson

Projektledare: Lars-Erik Wernersson	**Dr-examen:** 1998-05-26
Födelsedatum: 19680523	**Akademisk titel:** Professor
Kön: Man	**Arbetsgivare:** Lunds universitet
Land: Sverige	

Doktorsexamen

Examen	Organisation	Avhandlingens titel (originalspråk)	Handledare

Examen	Organisation	Avhandlingens titel (originalspråk)	Handledare
21002. Nanoteknisk elektronik, 1998-05-26	Lunds universitet, Fysiska institutionen 107131	Three-dimensional metal-semiconductor heterostructures for device applications	Lars Samuelson

Utbildning

Forskarutbildning

Examen	Organisation	Avhandlingens titel	Namn på handledare
Doktorsexamen, 10399. Annan fysik, 1998-06-02	Lunds universitet, Sverige	Three-dimensional metal-semiconductor heterostructures for device applications, 110 poäng	Lars Samuelson
Doktorsexamen, 21002. Nanoteknisk elektronik, 1998-05-26	Lunds universitet, Sverige, Fysiska institutionen 107131	Three-dimensional metal-semiconductor heterostructures for device applications	Lars Samuelson

Utbildning på grund- och avancerad nivå

År	Examen
1993	21001. Nanoteknik, Civilingenjörsexamen/motsv, Lunds universitet, Sverige

Arbetsliv

Anställningar

Period	Anställning	Del av forskning i anställningen (%)	Arbetsgivare
mars 2005 - Nuvarande	Professor	80	Lunds universitet, Sverige, Elektro- och informationsteknik 107201

Forskarutbyten

Period	Typ	Organisation	Ämne
februari 2011 - april 2011	Gästprofessor	Univeristy of Notre Dame, USA	21001. Nanoteknik
maj 2002 - april 2003	Gästforskare	Univeristy of Notre Dame, USA	21001. Nanoteknik

Meriter och utmärkelser

Docentur

År	Ämne	Organisation
2002	21001. Nanoteknik	Lunds universitet, Sverige

Handledda personer

År	Handledda personer	Lärosäte (handledd person)	Roll
2024	Doktorand, Saketh Ram		Huvudhandledare
2023	Doktorand, Anton Persson		Huvudhandledare
2023	Doktorand, Zhongyunshen Zhu		Huvudhandledare
2021	Doktorand, Adam Jönsson		Huvudhandledare
2021	Doktorand, Stefan Andric		Huvudhandledare
2020	Doktorand, Marcus Hellenbrand		Huvudhandledare
2019	Doktorand, Olli-Pekka Kilpi		Huvudhandledare
2019	Doktorand, Sebastian Heunsich		Huvudhandledare
2017	Doktorand, Elvedin Memisevic		Huvudhandledare
2016	Doktorand, Aein Shiribabadi		Huvudhandledare
2016	Doktorand, Jun Wu		Huvudhandledare
2015	Doktorand, Kristoffer Jansson		Huvudhandledare
2015	Doktorand, Lars Ohlsson		Huvudhandledare
2015	Doktorand, Martin Berg		Huvudhandledare
2014	Doktorand, Karl-Magnus Persson		Huvudhandledare
2013	Doktorand, Anil Dey		Huvudhandledare
2012	Doktorand, Borg Mattias		Huvudhandledare
2012	Doktorand, Egard Mikael		Huvudhandledare
2012	Doktorand, Mats Ärlelid		Huvudhandledare
2010	Doktorand, Astromskas Gvidas		Huvudhandledare

Bidrag erhållna i konkurrens

Period	Finansiär	Projektledare	Din roll	Delbelopp (kr)	Totalt belopp (kr)
2024 - 2028	VINNOVA - Verket för innovationssystem, Sverige - Annan forskningsfinansiär	Wernersson	Projektledare	0	121 554 000
2024 - 2027	Europeiska Unionen (EU),	IMEC	Medverkande	17 000 000	360 000 000
2022 - 2027	Europeiska Unionen (EU),	Lars-Erik Wernersson	Projektledare	0	25 000 000
2022 - 2025	VR - Vetenskapsrådet, Sverige - Annan forskningsfinansiär	Lars-Erik Wernersson	Projektledare	0	4 000 000
2020 - 2022	Europeiska Unionen (EU),	Larss-Erik Wernersson	Projektledare	0	45 000 000
2017 - 2022	VR - Vetenskapsrådet, Sverige - Annan forskningsfinansiär	Lars-Erik Wernersson	Projektledare	0	24 000 000
2015 - 2018	Europeiska Unionen (EU),	Larss-Erik Wernersson	Projektledare	0	43 000 000
2014 - 2020	Sverige - Universitet och högskolor,	Lars-Erik Wernersson	Projektledare	0	32 000 000
2010 - 2015	VR, Sverige - Övriga statliga myndigheter	Lars-Erik Wernersson	Projektledare	0	9 600 000
2004 - 2010	Sverige - Universitet och högskolor,	Lars-Erik Wernersson	Projektledare	0	9 000 000

Priser och utmärkelser

År	Land	Namn på priset/utmärkelsen	Utfärdare	Beskrivning
2022	Sverige	Medlem i IVA	IVA	
2018	USA	Best student paper award CSW	Compound Semiconductor Week	
2014	USA	Best student paper award	DRC	Pris till Cezar Zota
2014	Irland	Best student paper award	WODIM	Pris för Aein Shiribabadi
2012	Sverige	Elected member of the Royal Physiographical Society in Lund	the Royal Physiographical Society in Lund	Nominering och inval
2011	Sverige	SSF Successful Research Leaders	SSF	Framgångsrika forskningsledare
2010	Kina	Best student paper award	ICUWB	Pris till Mats Ärlelid
2008	Frankrike	Best student paper award	ICMOVPE	Pris till Mattias Borg
2005	USA	Best student paper award	DRC	Pris till Tomas Bryllert
2004	Sverige	SSF Ingvar Career Award	SSF	Framtidensforskningsledare

Andra meriter

Period	Typ av merit	Beskrivning
2024 - 2024	Conference Chair Compound Semiconductor Week	Conference Chair Compound Semiconductor Week (CSW) arranged in Lund, Sweden, June 3-6, 2024
2022 - 2022	Invald medlem av IVA	Invald i klassen för teknikens grunder och tvärvetenskap
2016 - 2021	Commercialization	Main founder of C2Amps (now NordAmps)
2017 - 2020	Board member of Royal Physiographic Society in Lund	
2011 - 2015	Editor for IEEE Transaction on Nanotechnology	
2010 - 2012	Chair for Engineering Physics-panel within the Swedish Research Council	
2011 - 2011	Commercialization	Main founder of Acconeer AB, Lund, Sweden, (high-frequency electronics)
2005 - 2005	Co-founder of QuNano AB, and later Sol Voltaics AB and Sol AB	

Immaterialrätt

Immaterialrätt

Typ	Datum för beviljning	Status	ID	Licensierad till annan	Produkt klassificering

Typ	Datum för beviljning	Status	ID	Licensierad till annan	Produkt klassificering
Patent		Beviljad	Semiconductor nanowire transistor	Sverige - Företag (även statliga och kommunala bolag samt statliga affärsdrivande verk)	32. Andra tillverkade varor
Patent		Beviljad	Semiconductor nanowire vertical device architecture	Sverige - Företag (även statliga och kommunala bolag samt statliga affärsdrivande verk)	32. Andra tillverkade varor
Patent		Beviljad	Method of producing precision vertical and horizontal layers in a vertical semiconductor structure	Sverige - Företag (även statliga och kommunala bolag samt statliga affärsdrivande verk)	32. Andra tillverkade varor
Patent		Beviljad	Assembly of Nanoscaled Field Effect Transistors	Sverige - Företag (även statliga och kommunala bolag samt statliga affärsdrivande verk)	32. Andra tillverkade varor
Patent		Beviljad	Nanowire Circuit Architecture	Sverige - Företag (även statliga och kommunala bolag samt statliga affärsdrivande verk)	32. Andra tillverkade varor
Patent		Beviljad	Nanostructure d MOS capacitor	Sverige - Företag (även statliga och kommunala bolag samt statliga affärsdrivande verk)	32. Andra tillverkade varor
Patent		Beviljad	Process for Manufacturing a Semiconductor Device and an Intermediate Product for the Manufacture of a Semiconductor Device	Sverige - Företag (även statliga och kommunala bolag samt statliga affärsdrivande verk)	32. Andra tillverkade varor
Patent		Beviljad	Transceiver Module	Sverige - Företag (även statliga och kommunala bolag samt statliga affärsdrivande verk)	32. Andra tillverkade varor

Typ	Datum för beviljning	Status	ID	Licensierad till annan	Produkt klassificering
Patent		Beviljad	Radial Nanowire Esaki Diode Devices and Methods	Sverige - Företag (även statliga och kommunala bolag samt statliga affärsdrivande verk)	32. Andra tillverkade varor
Patent		Beviljad	METHOD FOR A VERTICAL GATE-LAST PROCESS IN THE MANUFACTURING OF A VERTICAL NANOWIRE MOSFET	Sverige - Företag (även statliga och kommunala bolag samt statliga affärsdrivande verk)	32. Andra tillverkade varor

CV - Helena Rodilla

Medverkande forskare: Helena Rodilla
Födelsedatum: 19820324
Kön: Kvinna
Land: Sverige
Dr-examen: 2010-10-01
Akademisk titel: Docent
Arbetsgivare: Chalmers tekniska högskola

Utbildning

Forskarutbildning

Examen	Organisation	Avhandlingens titel	Namn på handledare
Doktorsexamen, 10399. Annan fysik, 2010-10-01	Universidad de Salamanca, Spanien, Applied Physics Department	Estudio de HEMTs basados en semiconductores de gap estrecho. Desde los materiales al dispositivo	Javier Mateos

Utbildning på grund- och avancerad nivå

År	Examen
2006	10399. Annan fysik, Magisterexamen, Universidad de Salamanca, Spanien

Arbetsliv

Anställningar

Period	Anställning	Del av forskning i anställningen (%)	Arbetsgivare
januari 2020 - Nuvarande	Associate Professor, Tillsvidareanställning	90	Chalmers tekniska högskola, Sverige, 59600 - Terahertz- & millimetervågstek
mars 2015 - januari 2020 (Nuvarande)	Forskarassistent, Vikariat	90	Chalmers tekniska högskola, Sverige, 59600 - Terahertz- & millimetervågstek

Period	Anställning	Del av forskning i anställningen (%)	Arbetsgivare
mars 2013 - februari 2015	Postdoktor	100	Chalmers tekniska högskola, Sverige, 59600 - Terahertz- & millimetervågstek
mars 2011 - februari 2013	Postdoktor	100	Chalmers tekniska högskola, Sverige, 59100 - Mikrovågselektronik
september 2006 - augusti 2010	Doktorand	90	Universidad de Salamanca, Spanien, Applied Physics Department

Postdoktorvistelser

Period	Organisation	Ämne
mars 2013 - februari 2015	Chalmers tekniska högskola, Sverige, 59600 - Terahertz- & millimetervågstek	20299. Annan elektroteknik och elektronik
mars 2011 - februari 2013	Chalmers tekniska högskola, Sverige, 59100 - Mikrovågselektronik	20299. Annan elektroteknik och elektronik

Forskarutbyten

Period	Typ	Organisation	Ämne
april 2009 - juni 2009	Gästforskare	Chalmers tekniska högskola, Sverige, 59100 - Mikrovågselektronik	20299. Annan elektroteknik och elektronik

Uppehåll i forskningen

Period	Beskrivning
2020-08-17 - 2022-01-28	Maternity leave. 100% 101 days, 75% 74days and 50% 239 days. Total 276 effective days (around 9 months)
2017-09-28 - 2018-12-31	Maternity leave. 100% 146 days, 60% 98 days and 50% 167 days. Total 288 effective days (around 10 months)

Meriter och utmärkelser

Docentur

År	Ämne	Organisation
2017	202. Elektroteknik och elektronik	Chalmers tekniska högskola, Sverige, Terahertz- & millimetervågsteknik

Handledda personer

År	Handledda personer	Lärosäte (handledd person)	Roll
2029	Doktorand, Daniel Hellmich		Huvudhandledare
2028	Doktorand, Francesco Fortunato		Huvudhandledare
2023	Doktorand, Anis Moradikouchi		Huvudhandledare
2022	Doktorand, Juan Cabello Sanchez		Huvudhandledare
2028	Doktorand, Shufei Sun		Bihandledare

År	Handledda personer	Lärosäte (handledd person)	Roll
2027	Postdok, Kasturie D. Jatkar		Huvudhandledare
2021	Gästpostdok, Irina Nefedova		Huvudhandledare

Bidrag erhållna i konkurrens

Period	Finansiär	Projektledare	Din roll	Delbelopp (kr)	Totalt belopp (kr)
2025 - 2028	VR - Vetenskapsrådet, Sverige - Annan forskningsfinansiär	Helena Rodilla	Projektledare	0	4 150 000
2025 - 2029	VR - Vetenskapsrådet, Sverige - Annan forskningsfinansiär	Helena Rodilla	Projektledare	0	10 000 000
2023 - 2023	Chalmers Excelence iniciative Nano, Sverige - Universitet och högskolor	Roland Kadar/Helena Rodilla	Medverkande	375 000	750 000
2021 - 2024	VR - Vetenskapsrådet, Sverige - Annan forskningsfinansiär	Helena Rodilla	Projektledare	0	3 700 000
2021 - 2021	VR - Vetenskapsrådet, Sverige - Annan forskningsfinansiär	Jan Stake	Medverkande	0	7 850 000
2020 - 2021	Genie Iniciative (Chalmers), Sverige - Universitet och högskolor	Helena Rodilla, Jan Stake	Projektledare	0	1 000 000
2019 - 2022	Europeiska Unionen (EU),	X. Shang, N. Ridler, et al.	Medverkande	845 000	20 000 000
2018 - 2021	Stiftelsen för Strategisk forskning, SSF, Sverige - Regioner och kommuner	Helena Rodilla	Medverkande	5 000 000	5 000 000
2016 - 2019	VR - Vetenskapsrådet, Sverige - Annan forskningsfinansiär	Helena Rodilla	Projektledare	0	3 400 000
2014 - 2014	Sverige - Universitet och högskolor,	Helena Rodilla	Projektledare	0	280 000

Priser och utmärkelser

År	Land	Namn på priset/utmärkelsen	Utfärdare	Beskrivning
2024	Sverige	VR Consolidator grant	VR project grant for young researchers	
2016	Sverige	Areas of Advance Prize 2016	Chalmers University of Technology	
2015	Sverige	VR project grant for young researchers	VR project grant for young researchers	

Andra meriter

Period	Typ av merit	Beskrivning
2025 - 2031	International Organizing Committee and Society Board Member	International Organizing Committee member of the Infrared, Millimetre, and Terahertz Waves, IRMMW-THz, society. (https://www.irmmw-thz.org/committee/)

Period	Typ av merit	Beskrivning
2025 - 2025	Conference organization	Technical Program Chair (TPC) for The 50th International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz) to be held in Helsinki in August 2025 (main international conference of the terahertz scientific community).
2019 - 2024	Editorial board	Associate Editor of the journal IEEE Transactions on Terahertz Science and Technology, main journal in the terahertz technology field.
2020 - 2020	Deputy Head of Division	Head of the Terahertz and Millimetre Wave Laboratory during the Sabbatical of Prof. Jan Stake at TU Delft.

CV - Tommy Shih

Medverkande forskare: Tommy Shih
Födelsedatum: 19760427
Kön: Man
Land: Sverige
Dr-examen: 2009-09-25
Akademisk titel: Docent
Arbetsgivare: Utrikespolitiska institutet

Utbildning

Forskarutbildning

Examen	Organisation	Avhandlingens titel	Namn på handledare
Doktorsexamen, 50202. Företagsekonomi, 2009-09-25	Uppsala universitet, Sverige, Företagsekonomiska inst	Scrutinizing a policy ambition to make business out of science: Lessons from Taiwan	Alexandra Waluszewski

Utbildning på grund- och avancerad nivå

År	Examen
2002	50202. Företagsekonomi, Magisterexamen, Uppsala universitet, Sverige

Arbetsliv

Anställningar

Period	Anställning	Del av forskning i anställningen (%)	Arbetsgivare
juli 2013 - Nuvarande	Lektor, Tillsvidareanställning	20	Lunds universitet, Sverige, Företagsekonomiska institutionen 263011

Meriter och utmärkelser

Docentur

År	Ämne	Organisation
2017	502. Ekonomi och näringsliv	Lunds universitet, Sverige, Företagsekonomiska institutionen 263011

CV - Jan Stake

Medverkande forskare: Jan Stake
Födelsedatum: 19710329
Kön: Man
Land: Sverige
Dr-examen: 1999-03-31
Akademisk titel: Professor
Arbetsgivare: Chalmers tekniska högskola

Utbildning

Forskarutbildning

Examen	Organisation	Avhandlingens titel	Namn på handledare
Doktorsexamen, 20299. Annan elektroteknik och elektronik, 1999-03-31	Chalmers tekniska högskola, Sverige	Planar Hererostructure Barrier Varactor Diodes for Millimetre Wave Applications	Erik Kollberg

Utbildning på grund- och avancerad nivå

År	Examen
1994	20299. Annan elektroteknik och elektronik, Civilingenjörsexamen/motsv, Chalmers tekniska högskola, Sverige
1992	20204. Telekommunikation, Högskoleingenjörsexamen/motsv, Högskolan Väst, Sverige

Arbetsliv

Anställningar

Period	Anställning	Del av forskning i anställningen (%)	Arbetsgivare	Övrig information
juli 2006 - Nuvarande	Professor, Tillsvidareanställning	80	Chalmers tekniska högskola, Sverige, 59600 - Terahertz- & millimetervågstek	
augusti 2003 - juni 2006	Lektor, Tillsvidareanställning	10	Chalmers tekniska högskola, Sverige, 59600 - Terahertz- & millimetervågstek	Head of nanofabrication laboratory at MC2
augusti 2001 - juli 2003	Konsult, Tillsvidareanställning	0	SAAB, Sverige, Combitech systems	

Postdoktorvistelser

Period	Organisation	Ämne
maj 1999 - april 2001	STFC Rutherford Appleton Laboratory, Storbritannien och Nordirland, Space Science and Technology Department	20299. Annan elektroteknik och elektronik

Forskarutbyten

Period	Typ	Organisation	Ämne

Period	Typ	Organisation	Ämne
oktober 2024 - september 2027	Gästprofessor	National Physical Laboratory, Storbritannien och Nordirland, Electromagnetic and Electrochemical Technologies	20299. Annan elektroteknik och elektronik
februari 2020 - juli 2020	Gästprofessor	Delft University of Technology, Nederländerna, Microelectronics	20299. Annan elektroteknik och elektronik
mars 2007 - juli 2007	Gästprofessor	California Institute of Technology	20299. Annan elektroteknik och elektronik
januari 1997 - juni 1997	Gästforskare	University of Virginia, USA, EE	20299. Annan elektroteknik och elektronik

Uppehåll i forskningen

Period	Beskrivning
2001-09-01 - 2003-04-30	Senior system consultant (microwave engineer), Saab Combitech Systems AB

Meriter och utmärkelser

Docentur

År	Ämne	Organisation
2002	20299. Annan elektroteknik och elektronik	Chalmers tekniska högskola, Sverige

Handledda personer

År	Handledda personer	Lärosäte (handledd person)	Roll
2024	Doktorand, Divya Jayasankar	Chalmers tekniska högskola, Sverige	Huvudhandledare
2020	Doktorand, Xinxin Yang	Chalmers tekniska högskola, Sverige, Terahertz- & millimetervågsteknik	Huvudhandledare
2019	Doktorand, Arvid Hammar	Chalmers tekniska högskola, Sverige	Huvudhandledare
2016	Doktorand, Michael Andersson	Chalmers tekniska högskola, Sverige	Huvudhandledare
2016	Doktorand, Robin Dahlbäck	Chalmers tekniska högskola, Sverige	Huvudhandledare
2015	Doktorand, Aleksandra Malko	Chalmers tekniska högskola, Sverige, 59600 - Terahertz- & millimetervågstek	Huvudhandledare
2013	Doktorand, Aik-Yean Tang	Chalmers tekniska högskola, Sverige	Huvudhandledare
2012	Doktorand, Omid Habibpour	Chalmers tekniska högskola, Sverige	Huvudhandledare
2011	Doktorand, Peter Sobis	Chalmers tekniska högskola, Sverige	Huvudhandledare
2009	Doktorand, Biddut Banik	Chalmers tekniska högskola, Sverige	Huvudhandledare
2004	Doktorand, Mattias Ingvarson	Chalmers tekniska högskola, Sverige	Huvudhandledare

År	Handledda personer	Lärosäte (handledd person)	Roll
2021	Doktorand, Muhammad Asad	Chalmers tekniska högskola, Sverige, Terahertz- & millimetervågsteknik	Bihandledare
2019	Doktorand, Marlene Bonmann	Chalmers tekniska högskola, Sverige, Terahertz- & millimetervågsteknik	Bihandledare
2017	Postdok, Andrey Generalov	Chalmers tekniska högskola, Sverige, Terahertz- & millimetervågsteknik	Huvudhandledare
2012	Postdok, Huan Zhao	Chalmers tekniska högskola, Sverige, 59600 - Terahertz- & millimetervågstek	Huvudhandledare

Bidrag erhållna i konkurrens

Period	Finansiär	Projektledare	Din roll	Delbelopp (kr)	Totalt belopp (kr)
2024 - 2029	Europeiska Unionen (EU),	Jan Stake	Projektledare	0	27 500 000
2024 - 2027	Europeiska Unionen (EU),	Helena Rodilla	Medverkande	5 900 057	485 051 577
2024 - 2028	VINNOVA - Verket för innovationssystem, Sverige - Annan forskningsfinansiär	Ivashina/Fager	Medverkande	11 000 000	70 000 000
2024 - 2027	Rymdstyrelsen, Sverige - Annan forskningsfinansiär	Jan Stake	Projektledare	0	7 368 000
2021 - 2024	VR - Vetenskapsrådet, Sverige - Annan forskningsfinansiär	Jan Stake	Projektledare	0	7 850 000
2020 - 2026	SSF - Stiftelsen för strategisk forskning, Sverige - Annan forskningsfinansiär	Joachim Oberhammer	Projektledare	0	17 500 000
2019 - 2023	SSF - Stiftelsen för strategisk forskning, Sverige - Annan forskningsfinansiär	Jan Stake	Projektledare	0	2 500 000
2018 - 2022	SSF - Stiftelsen för strategisk forskning, Sverige - Annan forskningsfinansiär	Jan Stake	Projektledare	0	2 500 000
2018 - 2021	VR - Vetenskapsrådet, Sverige - Annan forskningsfinansiär	Jan Stake	Projektledare	0	3 200 000
2013 - 2015	VR - Vetenskapsrådet, Sverige - Annan forskningsfinansiär	Jan Stake	Projektledare	0	3 039 000

Priser och utmärkelser

År	Land	Namn på priset/utmärkelsen	Utfärdare	Beskrivning

År	Land	Namn på priset/utmärkelsen	Utfärdare	Beskrivning
2024	Belgien	ERC Advanced Research Grant	European Research Council	
2006	USA	Senior Member	IEEE	
1995	Sverige	John Ericsson-medaljen	Chalmers tekniska högskola	

Andra meriter

Period	Typ av merit	Beskrivning
2016 - 2018	Editor-in-Chief	IEEE Transactions on Terahertz Science and Technology
2012 - 2015	Topical editor	IEEE Transactions on Terahertz Science and Technology

CV - Luca Zanini

Medverkande forskare: Luca Zanini
Födelsedatum: 19680128
Kön: Man
Land: Sverige
Dr-examen: 1998-09-01
Akademisk titel: Docent
Arbetsgivare: Ingen nuvarande arbetsgivare

Utbildning

Forskarutbildning

Examen	Organisation	Avhandlingens titel	Namn på handledare
Doktorsexamen, 10301. Subatomär fysik, 1998-09-01	Delft University of Technology, Nederländerna	neutron capture gamma-ray spectroscopy with Ag107, Ag109 and In115 for parity violation and nuclear structure studies	Hans Postma

Arbetsliv

Anställningar

Period	Anställning	Del av forskning i anställningen (%)	Arbetsgivare
september 2025 - juli 2074	Professor, Tillsvidareanställning	80	Danmarks Tekniske Universitet
augusti 2011 - augusti 2025	Forskare, Tillsvidareanställning	100	European Spallation Source
januari 2003 - juli 2011	Forskare, Tillsvidareanställning	100	Paul Scherrer Institut

Postdoktorvistelser

Period	Organisation	Ämne
januari 2001 - december 2002	Organisation Européenne pour la Recherche Nucléaire, Schweiz	10301. Subatomär fysik
januari 1999 - december 2000	Los Alamos National Lab, USA	10301. Subatomär fysik

Immaterialrätt

Immaterialrätt Typ	Datum för beviljning	Status	ID	Licensierad till annan	Produkt klassificering
Patent	2025-12-01	Beviljad	US20090162278A1	Nej	74. Tjänster från annan verksamhet inom juridik, ekonomi, vetenskap och teknik
Patent	2021-03-03	Beviljad	EP3459083A1	Nej	74. Tjänster från annan verksamhet inom juridik, ekonomi, vetenskap och teknik
Patent	2019-11-28	Beviljad	HU231202B1	Nej	74. Tjänster från annan verksamhet inom juridik, ekonomi, vetenskap och teknik

Registrera

Villkor

Ansökan ska förutom av den sökande även signeras av behörig företrädare för medelsförvaltaren. Företrädaren är vanligtvis prefekten vid den institution där forskningen ska bedrivas men beror på medelsförvaltares organisationsstruktur.

Signering av den *sökande* innebär en bekräftelse av att

- uppgifterna i ansökan är korrekta och följer Vetenskapsrådets instruktioner
- eventuella bisysslor och kommersiella bindningar har redovisats för medelsförvaltaren och att det där inte framkommit något som strider mot god forskningssed
- de tillstånd och godkännanden som krävs finns innan forskningen påbörjas, exempelvis tillstånd från Läkemedelsverket eller godkännande från Etikprövningsmyndigheten respektive djurförsöksetisk nämnd
- sökande kommer att följa samtliga övriga villkor som gäller för bidraget.

Signering av *medelsförvaltaren* innebär en bekräftelse av att

- den beskrivna forskningen eller forskningsstödjande verksamheten kan beredas plats vid medelsförvaltaren under den tid och i den omfattning som anges i ansökan
- den sökande kommer vara anställd vid medelsförvaltaren under den tid som ansökan avser
- medelsförvaltaren godkänner kostnadsberäkningen i ansökan
- medelsförvaltaren kommer att följa samtliga övriga villkor som gäller för bidraget.

Ovanstående punkter ska ha diskuterats mellan parterna innan företrädaren för medelsförvaltaren godkänner och signerar ansökan.