



UPCOMING EVENTS



C3NIT presents:

1 Invited talk, 5 contributed talks and 3 poster presentations at the compound semiconductor week 2024 in Lund, 3 – 6 June. Program Chair is C3NIT co-director Erik Lind and program committee members are Vanya Darakchieva and Muhammad Nawaz.

<https://mkon.nu/csw>

2 poster presentations at the GaN Marathon 2024 in Verona, 9 -12 June.

<https://ganmarathon.com/>

PUBLICATIONS

R. Ferrand Drake Del Castillo, et al., "Characterization of trapping effects related to carbon doping level in AlGaIn back-barriers for AlGaIn/GaN HEMTs", IEEE Trans. Electron. Dev., (2024), [link](#)

N. Armakavicius, et al., "Electron effective mass in GaN revisited: New insights from terahertz and mid-infrared optical Hall effect", APL Mater. **12** (2): 021114 (2024). [link](#)

S. Knight, et al., "Terahertz permittivity parameters of monoclinic single crystal lutetium oxyorthosilicate", Applied Physics Letters **124** (3), 032101 (2024). [link](#)

D. Gogova, et al., "High crystalline quality homoepitaxial Si-doped β -Ga₂O₃ (010) layers with reduced structural anisotropy grown by hot-wall MOCVD", Journal of Vacuum Science & Technology A **42** (2), 022708 (2024). [link](#)

A. Gustafsson, et al., "Cathodoluminescence investigations of darkline defects in platelet-based InGaIn nano-LED structures", Nanotechnology **35** (25), 255703 (2024). [link](#)

V. Rindert, et al., "THz Spectroscopic Electron Paramagnetic Resonance of the Fe³⁺ Defect in GaN", 48th International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz), 1–2 (2023). [link](#)

for more publications visit c3nit.se

C3NIT in the WBG Pilot Line 4

The C3NIT research groups at Lund, Chalmers and LiU form the Swedish node of the newly funded 4th Pilot Line on Wide Band Gap Semiconductors. C3NIT is responsible for the development and fabrication of GaN, AlN and Ga₂O₃ material and device technologies for rf and power applications. The total budget of the three universities is over 18 MEuro.

PROJECT UPDATES



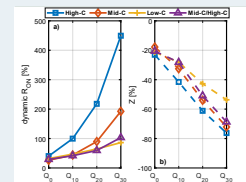
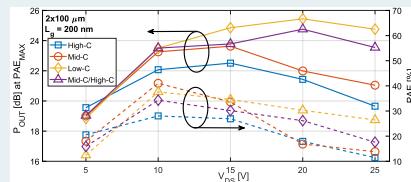
Linear E/W band HEMTs and MMICs

A novel drain current injection technique to assess drain-induced barrier lowering is developed by Chalmers. This method facilitates a direct measure of the threshold voltage over a wide range of drain-source voltages in a single measurement and provides generalized means to compare results from different device designs and sources.



High voltage HEMTs and circuits for power and microwave applications

In a joint effort by Chalmers SweGaN, and LiU, the impact of the C concentration in the graded back barrier and GaN buffer layers in microwave HEMTs for power amplification and generation is established.



Vertical devices for power application

Lund has developed Ti/Al/Ni/Au Ohmic contacts with a record low resistivity of 1.1×10^{-6} Ohm.cm² without any annealing, which is beneficial for processes demanding reduced thermal budget. Annealing at 750°C results in further reduction of the resistivity to 6.5×10^{-7} Ohm.cm².



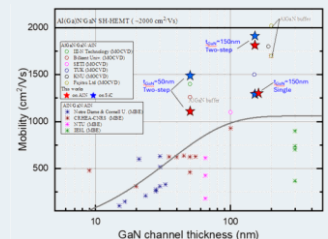
Propulsion/Charger/Converter/Switching applications

A converter set-up for doing double-pulse testing is built at Chalmers and initial experiments at reduced voltage are performed in excellent agreement with simulations.



Advanced epitaxial concepts for cost reduction

State-of-the-art AlGaIn/GaN HEMT structures on AlN substrates are developed at LiU and record high 2DEG mobility of 1800 cm²/V.s. are demonstrated for a GaN channel of 150 nm. Device processing is under way at Chalmers.



Next Board Meeting June 18th 2023 - 14:00 via Teams