17h15 – 17h45	Break
Session 8 Alloys	**Chair: Hadas SHTRIKMAN**
17h45 – 18h00	**Sofiane Haffouz**, *Quantum dot-in-a-rod nanowire for single photon emission at elevated temperatures*, National Research Council of Canada, Ottawa, Canada. p.68
18h00 – 18h15	**Lukas Wind**, *Highly transparent Contacts to SixGe1-x Nanowires embedded in Metal-Semiconductor-Metal Heterostructures*, Institute of Solid State Electronics, TU Wien, Vienna, Austria. p.69
18h15 – 18h30	**Nitin Srirang Mukhundhan**, *Purcell Enhanced coupling of nanowire quantum emitters to silicon photonic waveguides*, Walter Schottky Institut, Technical University of München, Germany.p.70

Wednesday, April 27, Morning

08:45 - 09:00	Registration
Session 9 Devices	**Chair: Michael FILLER**
9h00 – 9h30	**Jesper Nygård**, *Superconductor-semiconductor nanowires - in-situ fabrication schemes and new materials for hybrid quantum devices*, University of Copenhagen, Denmark. **Invited** p.72
9h30 – 9h45	**Remy Vermeersch**, *UV-C emission in the 230 - 280 nm range from AlN based light emitting diode*, CEA-PHELIQS-NPCS / CNRS-Institut Neel-SC2G, Grenoble, France. p.73
9h45 – 10h00	**Lukas Hrachowina**, *Axially defined InAsP/InP/GaInP triple-junction photovoltaic nanowires*, Lund University, Sweden. p.74

Highly transparent Contacts to Si_xGe_{1-x} Nanowires embedded in Metal-Semiconductor-Metal Heterostructures

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High-quality electrical contacts are of utmost importance for nanoscale devices as they have a large impact on their electrical performance, reliability and reproducibility. Nanowires (NWs) are of particular interest to ultra-scaled transistors because of their enhanced suppression of short channel effects. Especially, a deterministic top-down NW processing has brought inroads towards implementation into mature CMOS technology.

In this regard, we investigate contact formation in Si_xGe_{1-x} NWs with different Ge contents and further systematically compare results from both top-down [1] and bottom-up processed NWs, the former are formed by patterning epitaxial grown Si_xGe_{1-x} layers on SOI and the latter by VLS growth. Specifically, we apply the thermally induced Al-SiGe exchange in Si_xGe_{1-x} nanostructures, resulting in monolithic metal semiconductor heterostructures with highly transparent Al-Si_xGe_{1-x} interfaces [2], without the formation of intermetallic phases. By implementing Si_xGe_{1-x} NWs with different stochiometric compositions Schottky barrier field effect transistors (SBFETs) with tunable band structure as well as contact properties are studied. The corresponding electrical behavior of the fabricated devices, such as Schottky barrier height, on/off currents, subthreshold slope and electrostatic gating capabilities can be extracted and optimized for specific applications. Further, pulsed I-V measurements were conducted to investigate dynamic effects of charge carrier trapping at different time scales. TEM and EDX are performed for a detailed study of the interface configuration and elemental composition of the formed metal-semiconductor heterostructure after the exchange reaction and are correlated to electrical data. To complement the results parallel arrays of epitaxial Si_xGe_{1-x} NWs embedded in metal-semiconductor-metal heterostructures (Fig. 1) are used to enable reconfigurable field-effect transistors (RFETs) to deliver controllable charge carrier polarity at runtime [3].

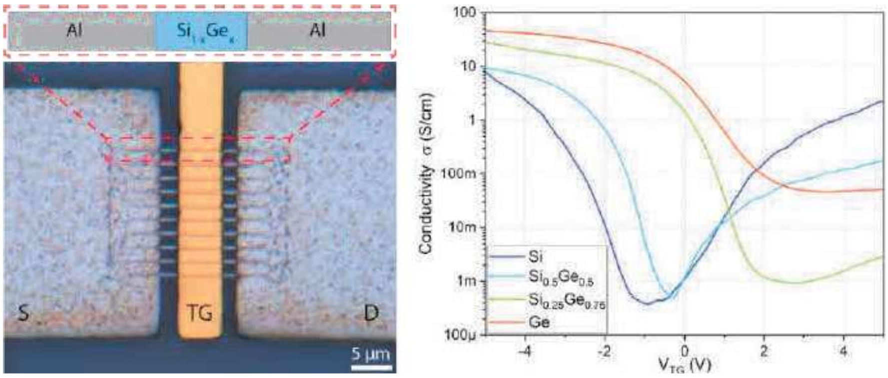

Figure 1 (left) Optical microscope image of a top-down fabricated SBFET, consisting of a parallel array of Al-Si_xGe_{1-x}-Al NW heterostructures. (right) Comparison of the transfer characteristics of NW-FETs with different Si_xGe_{1-x} compositions ranging from pure Si to pure Ge structures.

[1] L. Wind, M. Sistani, Z. Song, X. Maeder, D. Pohl, J. Michler, B. Rellinghaus, W. M. Weber, and A. Lugstein, ACS Applied Materials and Interfaces **13**, 12393 (2021).

[2] M.A. Luong, E. Robin, N. Pauc, P. Gentile, T. Baron, B. Salem, M. Sistani, A. Lugstein, M. Spies, B. Fernandez, and M. den Hertog, ACS Applied Nano Materials **3**, 10427 (2020).

[3] R. Böckle, M. Sistani, B. Lipovec, D. Pohl, B. Rellinghaus, A. Lugstein, and W. M. Weber, Advanced Materials Technologies, 2100647