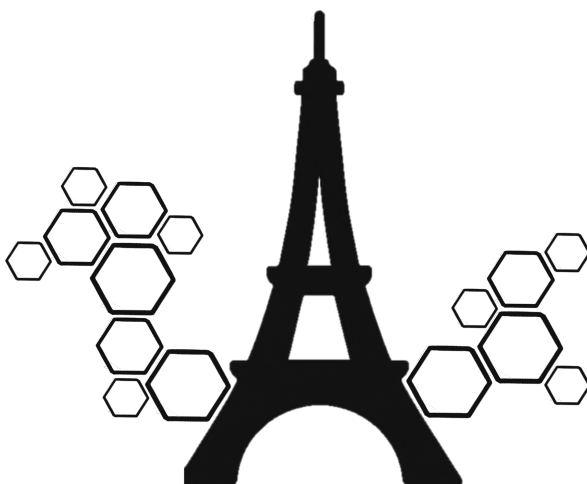


3rd International Workshop

Hexagonal SiGe and Related Materials



27-28 October 2025

International Conference Center
Sorbonne Université
Paris, France

Organizers

Michele Amato

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<https://workshop-hexsige-2025.github.io/>

Sponsors



Description

The 3rd International Workshop on Hexagonal SiGe and related materials will take place on **27-28 October 2025** at the International Conference Center of **Sorbonne Université in Paris, France**. The key objective of this interdisciplinary workshop is to identify challenges towards a fundamental understanding of the main properties of hexagonal silicon and related materials. This will be the third edition of a series of workshops on the physics, chemistry and applications of group IV hexagonal materials after the two successful previous editions in Eindhoven (2023) and Milan (2024). By bringing the most recent experimental and theoretical viewpoints together, we aim to cover the following topics:

- Growth of Hex-SiGe nanowires.
- Planar growth of Hex-SiGe and integration on silicon.
- Characterization of structural, electronic, and optical properties of Hex-SiGe.
- Defects in Hex-SiGe.
- First principles calculations of Hex-SiGe electronic properties.
- Modeling of Hex-SiGe structural and functional properties.
- Pressure-induced phase transitions: towards Hex-SiGe.
- Towards Hex-SiGe-based devices.
- III-Vs, II-VIs and related materials.

Monday 27th October		Tuesday 28th October	
08:30 - 09:00	Registration	08:30 - 09:00	
09:00 - 09:10	Presentation Organizer	09:00 - 09:40	Invited speaker José Penuelas
09:10 - 10:00	Keynote speaker Friedhelm Bechstedt	09:40 - 10:00	Ries Koolen
10:00 - 10:40	Invited speaker Chris G. Van de Walle	10:00 - 10:20	Andrea Besana
10:40 - 11:00	Christopher A. Broderick	10:20 - 10:40	Kyriaki Samioti
11:00 - 11:20	Coffee Break	10:40 - 11:00	Perpetua W. Muchiri
11:20 - 12:00	Invited speaker Michele Re Fiorentin	11:00 - 11:20	Coffee Break
12:00 - 12:20	Esther van de Logt	11:20 - 12:00	Invited speaker Jos E.M. Haverkort
12:20 - 12:40	Madiha M. Makhdoom	12:00 - 12:20	Riccardo Farina
12:40 - 14:40	LUNCH POSTER SESSION	12:20 - 12:40	Denny Lamon
14:40 - 15:20	Invited speaker Bianca Haberl	12:40 - 14:00	LUNCH
15:20 - 16:00	Invited speaker Kiran Mangalampalli	14:00 - 14:40	Invited speaker Anna Marzegalli
16:00 - 16:20	Coffee Break	14:40 - 15:00	Frank Glas
16:20 - 17:00	Invited speaker Jonathan J. Finley	15:00 - 15:20	Fabrizio Rovaris
17:00 - 17:20	Veronica Regazzoni	15:20 - 15:40	Mette F. Schouten
17:20 - 17:40	Corentin Chatelet	15:40 - 16:00	Hafssa Ameziane
17:40 - 18:00	Steffen Meder	16:00 - 16:20	Coffee Closing Session
19:00	Social Dinner		

Monday 27th October

08:30- 09:00	Registration
9:00- 9:10	Presentation
09:10- 10:00	Friedhelm Bechstedt , Friedrich-Schiller-Universitaet Jena Light emission from hexagonal SiGe?
10:00- 10:40	Chris G. Van de Walle , University of California, Santa Barbara First-principles theory of optical emission from hexagonal Ge
10:40- 11:00	Christopher A. Broderick , School of Physics, University College Cork Electronic and optical properties of stacking faults in hexagonal germanium
11:00- 11:20	COFFE BREAK
11:20- 12:00	Michele Re Fiorentin , Politecnico di Torino First-principles study of optical properties of hexagonal Si and Ge nanowires
12:00- 12:20	Esther van de Logt , University of Twente Electrical characterization of hexagonal silicon-germanium nanowires
12:20- 12:40	Madiha M. Makhdoom , University of Padova Composition dependent bandgap and thermal conductivity in hexagonal SiGe alloys: a DFT approach
12:40- 14:40	LUNCH AND POSTER SESSION
14:40- 15:20	Bianca Haberl , Oak Ridge National Laboratory and Australian National University Nucleation of hexagonal Si from bc8-Si on thermal annealing - Impact of sample volume and residual stresses on phase behavior
15:20- 16:00	Kiran Mangalampalli , SRM University A. P. Localized synthesis of mosaic hexagonal silicon via nanoindentation: reversible phase transformation and nanoscale electrical diagnostics
16:00- 16:20	COFFE BREAK
16:20- 17:00	Jonathan J. Finley , Walter Schottky Institut, Technical University of Munich Integration of hexagonal SiGe into silicon photonic nanostructures

17:00- **Veronica Regazzoni**, Università di Milano Bicocca
17:20 **Electronic properties of perfect dislocations in germanium: a first-principles study**

17:20- **Corentin Chatelet**, C2N, CNRS, Université Paris-Saclay
17:40 **Growth and characterization of hexagonal GaAs thin film on ZnS-4H**

17:40- **Steffen Meder**, Walter Schottky Institut, Technical University of Munich
18:00 **Lasing from individual InAs nanowires up to room temperature – A model system to compare with hexagonal-SiGe**

19:00 **SOCIAL DINNER**

Poster session

Monday 27th October, 12:40-14:40h

P1	Claudius S. A. Müller , University of Twente Realization of Ohmic Contacts on hexagonal SiGe Nanowires
P2	Anirban Das , Institute of Physics, Budapest University of Technology and Economics Hexagonal Germanium Nanowires as a Spin Qubit Platform
P3	Hadrien Le Petit , Walter Schottky Institut, Technical University of Munich Integration of Hex-SiGe into a NW-induced Photonic Crystal Cavity
P4	Dingshan Liu , Walter Schottky Institut, Technical University of Munich Exploring spin dynamic properties of direct-bandgap hex-SiGe for On-Chip silicon photonics applications
P5	Yetkin Pulcu , University of Konstanz Electronic and optical properties of hexagonal SiGe and GeSn alloys: a combined first-principles and k·p investigation
P6	Regis Andre , Institut NEEL - CNRS Pseudo-substrates, based on m-plane ZnS, for hexagonal SiGe growth
P7	Antonio M. Mio , CNR-IMM Catania TEM analysis of textured silicon polymorph crystals obtained via nanoindentation and annealing
P8	Fabrizio Rovaris , Università di Milano Bicocca Pressure-dependent kinetics of phase transitions in Si and Ge using machine learning interatomic potentials
P9	Órla N. McElhatton , School of Physics, University College Cork Empirical tight-binding Hamiltonian for cubic and hexagonal Ge: parametrisation from first-principles calculations
P10	Cedric Gonzales , University of Basel Chemical vapor deposition growth of Ge/Si-based nanowire heterostructures as hole spin qubit device platforms
P11	Arianna Nigro , University of Basel Ge/Si_{1-x}Ge_x planar heterostructures for spin qubit applications
P12	Marvin Marco Jansen , Eindhoven university of technology Silicon germanium interdiffusion in hexagonal SiGe heterostructures
P13	Sahar Gaddour , Groupe d'Étude de la Matière Condensée (GEMaC) Structural characterization of Cd_{1-x}Zn_xS thin films grown on GaAs and on a- and m-plane wurtzite CdS substrates by metalorganic chemical vapor deposition for the synthesis of hexagonal Si_xGe_{1-x} layers

Tuesday 28th October

09:00-09:40 **José Penuelas**, Ecole Centrale de Lyon
Growth of hexagonal Ge on GaAs nanowires by molecular beam epitaxy

09:40-10:00 **Ries Koolen**, Eindhoven university of technology
Progress in planar hex-Ge grown on metal sulfide substrates

10:00-10:20 **Andrea Besana**, Department of Physics, Politecnico di Milano
Planar hexagonal germanium grown on cadmium sulfide substrate by low-energy plasma-enhanced chemical vapor deposition

10:20-10:40 **Kyriaki Samioti**, Laboratoire de Physique des Solides, Université Paris-Saclay
Experimental study of the electronic band structure of hexagonal GaAs

10:40-11:00 **Perpetua W. Muchiri**, Laboratoire de Physique des Solides, Université Paris-Saclay
Dopant interactions with I3-basal stacking faults in hexagonal silicon: first-principles insights into fundamental mechanisms

11:00-11:20 **COFFE BREAK**

11:20-12:00 **Jos E.M. Haverkort**, Eindhoven university of technology
Optical properties of hex-SiGe

12:00-12:20 **Riccardo Farina**, Eindhoven university of technology
Heat management in hex-SiGe nanowires for silicon-compatible lasers

12:20-12:40 **Denny Lamon**, Eindhoven university of technology
Hexagonal SiGe quantum structures realized in nanowires

12:40-14:00 **LUNCH**

14:00-14:40 **Anna Marzegalli**, Università di Milano Bicocca
Towards Hexagonal Germanium via Nanoindentation

14:40-15:00 **Frank Glas**, C2N, CNRS, Université Paris-Saclay
The role of the contact angle in the hexagonal/cubic transition in semiconductor nanowires

15:00-15:20 **Fabrizio Rovaris**, Università di Milano Bicocca
Origin and evolution of I3 defects in hexagonal silicon and germanium

15:20-15:40 **Mette F. Schouten**, Eindhoven university of technology
Increased hexagonality in hex-SiGe core-shell nanowires

15:40- **Hafssa Ameziane**, C2N, CNRS, Université Paris-Saclay
16:00 **Growing SiGe nanowires with the hexagonal phase**

16:00-
16:20

Closing Session and Coffee

