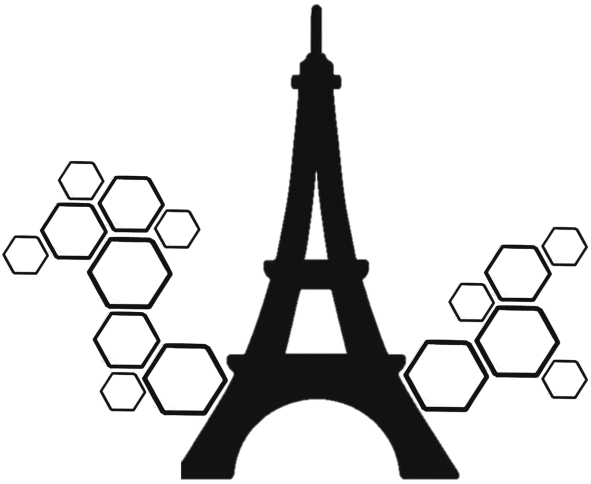
3rd International Workshop

Hexagonal SiGe and Related Materials



27-28 October 2025

International Conference Center
Sorbonne Université
Paris, France

Organizers

Michele Amato
Université Paris-Saclay, France

Silvia Pandolfi
Sorbonne Université, France

Silvana Botti
Ruhr University, Germany

Laetitia Vincent
Université Paris-Saclay, France

Marc Túnica
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Venue

International Conference Centre Sorbonne Université (CICSU)
Patio 44, 4
Place Jussieu 55, 75005 Paris, France

Nearest Metro Station: Jussieu (Lines 7 and 10)

Bus Stops Nearby:
- Jussieu (Lines 67, 89)
- Cuvier – Jardin des Plantes (Lines 63, 67, 89)
- Institut du Monde Arabe (Lines 86, 87)
- Place Monge (Lines 63, 75, 86)
- Cardinal Lemoine (Lines 63, 67, 89)

By Train / RER:
- Gare d'Austerlitz (RER C)
- Gare de Lyon (Mainline Train)

Parking: Campus Pierre et Marie Curie car park (upon request)

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.

Recent advances, such as the demonstration of direct bandgap emission in hexagonal SiGe nanowires and improved modeling of phase stability, have significantly expanded the frontiers of this emerging material system. The workshop will provide a unique platform to exchange knowledge, discuss open challenges, and outline future directions for both fundamental research and technological applications.

Monday 27th October		
08:30 - 09:00	Registration	
09:00 - 09:10	Presentation **Organizers**	
09:10 - 10:00	Keynote speaker **Friedhelm Bechstedt**	Chair **Emilio Scalise**
10:00 - 10:40	Invited speaker **Chris G. Van de Walle**	
10:40 - 11:00	**Christopher A. Broderick**	
11:00 -11:20	**Coffee Break**	
11:20 - 12:00	Invited speaker **Michele Re Fiorentin**	Chair **Silvana Botti**
12:00 - 12:20	**Esther van de Logt**	
12:20 – 12:40	**Madiha M. Makhdoom**	
12:40 – 14:40	**LUNCH** **POSTER SESSION**	
14:40 – 15:20	Invited speaker **Bianca Haberl**	Chair **Alexandre Courac**
15:20 – 16:00	Invited speaker **Kiran Mangalampalli**	
16:00 - 16:20	**Coffee Break**	
16:20 – 17:00	Invited speaker **Steffen Meder**	Chair **Erik Bakkers**
17:00 – 17:20	**Veronica Regazzoni**	
17:20 – 17:40	**Corentin Chatelet**	
18:45	**Social Dinner**	

Tuesday 28th October		
08:30 - 09:00		
09:00 - 09:40	Invited speaker **José Penuelas**	Chair **Bianca Haberl**
09:40 - 10:00	**Ries Koolen**	
10:00 - 10:20	**Andrea Besana**	
10:20 - 10:40	**Kyriaki Samioti**	
10:40 - 11:00	**Perpetua W. Muchiri**	
11:00 - 11:20	**Coffee Break**	
11:20 - 12:00	Invited speaker **Jos E.M. Haverkort**	Chair **Laettitia Vincent**
12:00 - 12:20	**Riccardo Farina**	
12:20 - 12:40	**Denny Lamon**	
12:40 - 14:00	**LUNCH**	
14:00 - 14:40	Invited speaker **Anna Marzegalli**	Chair **Christopher A. Broderick**
14:40 - 15:00	**Frank Glas**	
15:00 - 15:20	**Fabrizio Rovaris**	
15:20 - 15:40	**Mette F. Schouten**	
15:40 - 16:00	**Hafssa Ameziane**	
16:00 – 16:20	**Twente conference announcement** **Coffee Break** **Closing Session**	

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,** The 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	**Steffen Meder,** 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**
17:20-17:40	**Corentin Chatelet,** C2N, CNRS, Université Paris-Saclay **Growth and characterization of hexagonal GaAs thin film on ZnS-4H**
18:45	**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	**Marvin Marco Jansen,** Eindhoven university of technology **Silicon germanium interdiffusion in hexagonal SiGe heterostructures**
P12	**Sahar Gaddour,** Groupe d'Étude de la Matière Condensée (GEMaC) **Structural characterization of Cd1-xZnxS 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**
P13	**Alexandre Courac,** IMPMC, CNRS, Sorbonne university **Crystallography of silicon element: stable and metastable crystalline forms**

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**

15:40-16:00	**Hafssa Ameziane,** C2N, CNRS, Université Paris-Saclay **Growing SiGe nanowires with the hexagonal phase**
16:00-16:20	**Closing Session and Coffee Break**