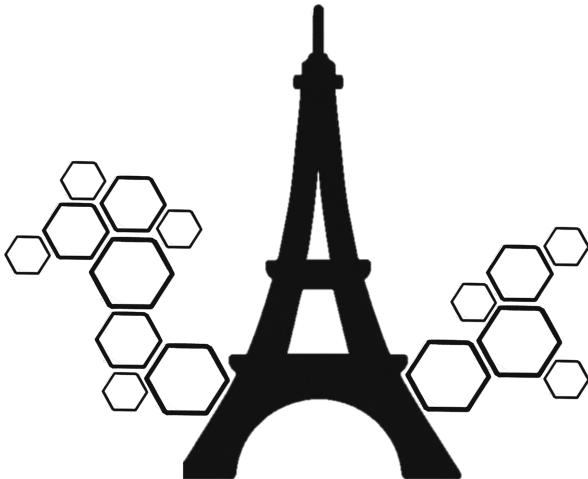


3rd International Workshop

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

Université Paris-Saclay, France



Contact

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🌐 <https://workshop-hексиге-2025.github.io/>

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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)

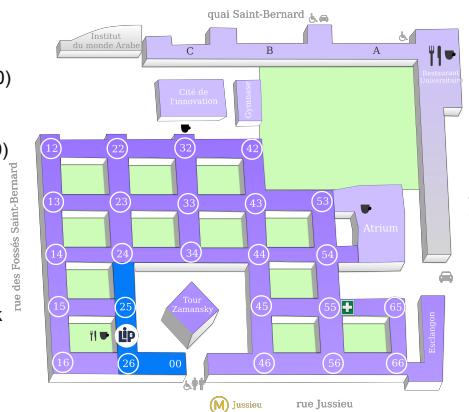
Bus Stops Nearby:

- 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)
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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			Tuesday 28th October		
08:30 - 09:00	Registration		08:30 - 09:00		
09:00 - 09:10	Presentation Organizers		09:00 - 09:40	Invited speaker José Penuelas	Chair Bianca Haberl
09:10 - 10:00	Keynote speaker Friedhelm Bechstedt	Chair Emilio Scalise	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	Chair Silvana Botti	11:00 - 11:20	Coffee Break	
12:00 - 12:20	Esther van de Logt		11:20 - 12:00	Invited speaker Jos E.M. Haverkort	Chair Laettitia Vincent
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	Chair Alexandre Courac	12:40 - 14:00	LUNCH	
15:20 - 16:00	Invited speaker Kiran Mangalampalli		14:00 - 14:40	Invited speaker Anna Marzegalli	Chair Christopher A. Broderick
16:00 - 16:20	Coffee Break		14:40 - 15:00	Frank Glas	
16:20 - 17:00	Invited speaker Steffen Meder	Chair Erik Bakkers	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	
18:45	Social Dinner		16:00 - 16:20	Twente conference announcement Coffee Break Closing Session	

Hexagonal SiGe and Related Materials

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	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- **Corentin Chatelet**, C2N, CNRS, Université Paris-Saclay

17:40 **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
-
- Dingshan Liu, Walter Schottky Institut, Technical University of Munich
P4 **Exploring spin dynamic properties of direct-bandgap hex-SiGe for On-Chip silicon photonics applications**
-
- Yetkin Pulcu, University of Konstanz
P5 **Electronic and optical properties of hexagonal SiGe and GeSn alloys: a combined first-principles and k-p investigation**
-
- Regis Andre, Institut NEEL - CNRS
P6 **Pseudo-substrates, based on m-plane ZnS, for hexagonal SiGe growth**
-
- Antonio M. Mio, CNR-IMM Catania
P7 **TEM analysis of textured silicon polymorph crystals obtained via nanoindentation and annealing**
-
- Fabrizio Rovaris, Università di Milano Bicocca
P8 **Pressure-dependent kinetics of phase transitions in Si and Ge using machine learning interatomic potentials**
-
- Órla N. McElhatton, School of Physics, University College Cork
P9 **Empirical tight-binding Hamiltonian for cubic and hexagonal Ge: parametrisation from first-principles calculations**
-
- Cedric Gonzales, University of Basel
P10 **Chemical vapor deposition growth of Ge/Si-based nanowire heterostructures as hole spin qubit device platforms**
-
- Marvin Marco Jansen, Eindhoven university of technology
P11 **Silicon germanium interdiffusion in hexagonal SiGe heterostructures**
-
- Sahar Gaddour, Groupe d'Étude de la Matière Condensée (GEMaC)
P12 **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**
-
- Alexandre Courac, IMPMC, CNRS, Sorbonne university
P13 **Crystallography of silicon element: stable and metastable crystalline forms**
-

Hexagonal SiGe and Related Materials

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	COFFEE 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 Break

