

TECHNICAL PROGRAM - CMCS 2025

Computational Modeling of Complex Materials Across the Scales

May 13-16, 2025 - Gustave Eiffel University, Champs-sur-Marne, France

<https://cmcs2025.sciencesconf.org>



Program overview

Time table	Tuesday May 13	Wednesday May 14	Thursday May 15	Friday May 16
8:00	Welcome Coffee Registration			
8:45	Introduction	Welcome Coffee	Welcome Coffee	Welcome Coffee
9:00	Lectures <i>Chair: J. Yvonnet</i>	Lectures <i>Chair: M.G.D. Geers</i>	Lectures <i>Chair: V. Kouznetsova</i>	Lectures <i>Chair: A. Pandolfi</i>
10:30	Coffee break	Coffee break	Coffee break	Coffee break
11:00	Lectures <i>Chair: P. Steinmann</i>	Poster Session	Lectures <i>Chair: J. Rimoli</i>	Lectures <i>Chair: J. Zeman</i>
12:30	Lunch break	Lunch break	Lunch break	Lunch break
13:30	Lectures <i>Chair: D.M. Kochmann</i>	Lectures <i>Chair: K. Veroy-Grepl</i>	Lectures <i>Chair: K. Terada</i>	
15:30	Coffee break	Coffee break	Coffee break	
16:00	Lectures <i>Chair: F. Hild</i>	Lectures <i>Chair: F. Aldakheel</i>	Lectures <i>Chair: M. Muramatsu</i>	
17:30	Welcome Cocktail Reception			
19:00			Conference Banquet	

Program - Tuesday, May 13

8:00	Welcome Coffee and Registration
8:45	Introduction to CMCS 2025
9:00	Lectures <i>Chair: J. Yvonnet</i>
9:00	Dark Energy in Crystals: Prediction of Stored Energy and Impact on Recrystallization S. Forest , <i>F. Ghiglione, V. Phalke, A. Ask, K. Ammar</i>
9:45	Fracture in Concrete: X-Ray Tomography With in-Situ Testing, Digital Volume Correlation and Phase-Field Modeling <i>A. Mishra, P. Carrara, M. Griffa, L. De Lorenzis</i>
10:00	Computational Modeling of Intertwined Architected Materials D.M. Kochmann , <i>E. Pesciulli, K. Karapiperis</i>
10:30	Coffee break
11:00	Lectures <i>Chair: P. Steinmann</i>
11:00	Probing Ductile Damage Models With Random Porous Metamaterials <i>A. Rocco, L. Salvi, B. Smaniotto, F. Hild, M.G. Tarantino</i>
11:30	Phase Field Modeling and FEM Simulation of Bone Fracture Occurring in Human Vertebra After Screws Fixation Procedure P. Lenarda , <i>D. Preve, D. Bianchi, A. Gizzi, M. Paggi</i>
12:00	Modeling of Short Crack Propagation: Coupling Phase Field Method With Discrete Dislocation Dynamics B. Appolaire , <i>L. Eon, A. Finel, R. Gatti</i>
12:30	Lunch break
13:30	Lectures <i>Chair: D.M. Kochmann</i>
13:30	Interface Fracture and Morphogenesis in Solid State Batteries <i>R. Gulati, M. Faghih Shojaei, X. Zhang, T. Gupta, K. Garikipati</i>
14:00	Modelling Liquid Uptake, Expansion and Curl of Paper Sheets <i>N. Dave, C. Rojas, T. Massart, M.G.D. Geers, R. Peerlings</i>
14:30	Fully Coupled Model for Analysis of Shape Memory Alloy M. Muramatsu , <i>C.M. Landis</i>
15:00	Data-Driven Mechanics of Softening Materials <i>V. Kamasamudram, L. Stainier</i>
15:30	Coffee break
16:00	Lectures <i>Chair: F. Hild</i>
16:00	In-Silico Design of Electro-Active Polymer Based Soft Robotics: Stability, Multi-Scale Modelling and Enhanced Gaussian Predictors A.J. Gil , <i>R. Ortigosa, J. Martínez-Frutos, N. Ellmer</i>
16:30	Computational Homogenization of Porous Media – Application to Ion Transport in Batteries F. Larsson , <i>D. Rollin, K. Runesson, R. Janicke</i>
17:00	A Unified Dual Modeling Framework for Soft and Hard Magnetorheological Elastomers: Theory, Computations and Experiments K. Danas , <i>D. Mukherjee, M. Rambauser</i>
17:30	Welcome Cocktail and Reception

Program - Wednesday, May 14

8:45	Welcome Coffee
9:00	Lectures <i>Chair: M.G.D Geers</i>
9:00	On Efficiency and Accuracy of Eigenstrain Homogenization Method for Modeling Polycrystalline Materials <i>A. Nasirov, C. Oskay</i>
9:45	Multiscale Modeling of Electro-Chemo-Mechanical Interactions in Particle Composites With Material Interfaces <i>R. Jänicke, D. Rollin, K. Runesson, F. Larsson</i>
10:00	A 3D Multi-Scale Hygro-Mechanical Model of Oak Wood <i>M.A. Livani, A.S.J. Suiker, E. Bosco</i>
10:30	Coffee break
11:00	Poster Session
12:30	Lunch break
13:30	Lectures <i>Chair: K. Veroy-Grepl</i>
13:30	Recent Developments on Physics-Augmented Neural Networks for Material Modeling <i>O. Weeger, D.K. Klein</i>
14:00	Physics-based Machine Learning for Computational Failure Mechanics <i>F. Aldakheel</i>
14:30	Deep Learning-Based Multiscale Modeling Framework for Two-Phase Fiber-Reinforced Microstructures <i>L. Graham-Brady, A. Gupta, I. Saha</i>
15:00	Symmetry-Enforcing Neural Networks With Applications to Constitutive Modeling <i>K. Garanger, J. Kraus, J.J. Rimoli</i>
15:30	Coffee break
16:00	Lectures <i>Chair: F. Aldakheel</i>
16:00	Learning Elastoplasticity With Implicit Layers <i>J. Bleyer</i>
16:30	Multiphysics Modeling of Electroactive Polymers <i>M. Jabareen</i>
17:00	A Clustering Approach to Accelerate FE ² Anisotropic Fracture Simulations <i>J. Yvonnet, S. Chaouch</i>

Program - Thursday, May 15

8:45	Welcome Coffee
9:00	Lectures <i>Chair: V. Kouznetsova</i>
9:00	RBF-based Surrogate Computational Homogenization for 3D Inelastic Composites K. Terada , A. Nakamura, Y. Yamanaka
9:45	Model Order Reduction for Parametrized Two-Scale Simulations T. Guo, O. Rokos, V.G. Kouznetsova, M.G.D. Geers, K. Veroy-Grepl
10:00	Physically Recurrent Neural Networks Applied to Multiscale Analysis of Thermoplastic Composites M.A. Maia, I.B.C.M. Rocha, D. Kovačević, F.P. van der Meer
10:30	Coffee break
11:00	Lectures <i>Chair: J.J. Rimoli</i>
11:00	Thermo-Plastic Nonuniform Transformation Field Analysis F. Fritzen , J. Herb, S. Sharba
11:30	Generative DIC-FEMU With Unknown Fields of Material Constants Enabled by Sparse Gaussian Process Priors P. Kerfriden , A. Touminet, V. Fabre, S. Cantournet
12:00	FFT Solvers for Computational Micromechanics: Enhancing Numerical Efficiency Through PDE Preconditioning Perspective M. Ladecký, I. Pultarová, J. Zeman
12:30	Lunch break
13:30	Lectures <i>Chair: K. Terada</i>
13:30	Simulation Framework for the Chemical Degradation in Polymeric Solids K. Steiakakis, G.G. Vogiatzis, L.C.A. van Breemen, M. Hütter
14:00	Canonical Interfaces With Application to Micro-Heterogeneous Solids A. Javili, F. Larsson, K. Runesson, P. Steinmann
14:30	Modeling of Additive Manufacturing Processes of Metals – A Multiscale Approach A. Menzel , I. Noll, T. Bartel
15:00	The Minimum Energy Atomic Deposition Method for Thin Film Growth and Mechanics S. Karewar, G. Clavier, O. van der Sluis, J. Hoefnagels, M.G.D. Geers
15:30	Coffee break
16:00	Lectures <i>Chair: M. Muramatsu</i>
16:00	Metamaterials for Acoustic and Elastic Subwavelength Applications: Design and Multi-Scale Modelling V. Kouznetsova , X. Kuci, R. Liupekevicus, H. van Dommelen, M.G.D. Geers
16:30	A Continuum-Micromechanical Model of the Human Stroma A. Pandolfi , M.L. De Bellis, C. Miller
19:00	Conference Banquet <i>Restaurant Flora Danica, 142 Avenue des Champs Elysées, Paris, 75 008</i>

Program - Friday, May 16

8:45	Welcome Coffee
9:00	Lectures <i>Chair: A. Pandolfi</i>
9:00	A Better Synergy Between Meshing and Computing to Track Fronts (and More): X-MESH N. Moës
9:45	Databased Multi-Scale Topology Optimization of Architected Materials A. Gravouil , <i>T. Djourachkovitch, N. Blal, N. Hamila</i>
10:00	A Sequential Approach for Topology Optimization of Coated, Manufacturable Structures E. Chroni , <i>D. Savvas, V. Papadopoulos</i>
10:30	Coffee break
11:00	Lectures <i>Chair: J. Zeman</i>
11:00	Gradient-Extended Modeling of Porous Media Across the Scales <i>E. Polukhov, H. Khurshid</i> , M.-A. Keip
11:30	Nonlocal Elasticity via Continuum-Kinematics-Inspired Peridynamics A. Javili , <i>A. McBride, P. Steinmann</i>
12:00	Continuum-Kinematics-Inspired Peridynamics for Transverse Isotropy A. McBride , <i>A. De Villiers, A. Javili, P. Steinmann</i>
12:30	Lunch break

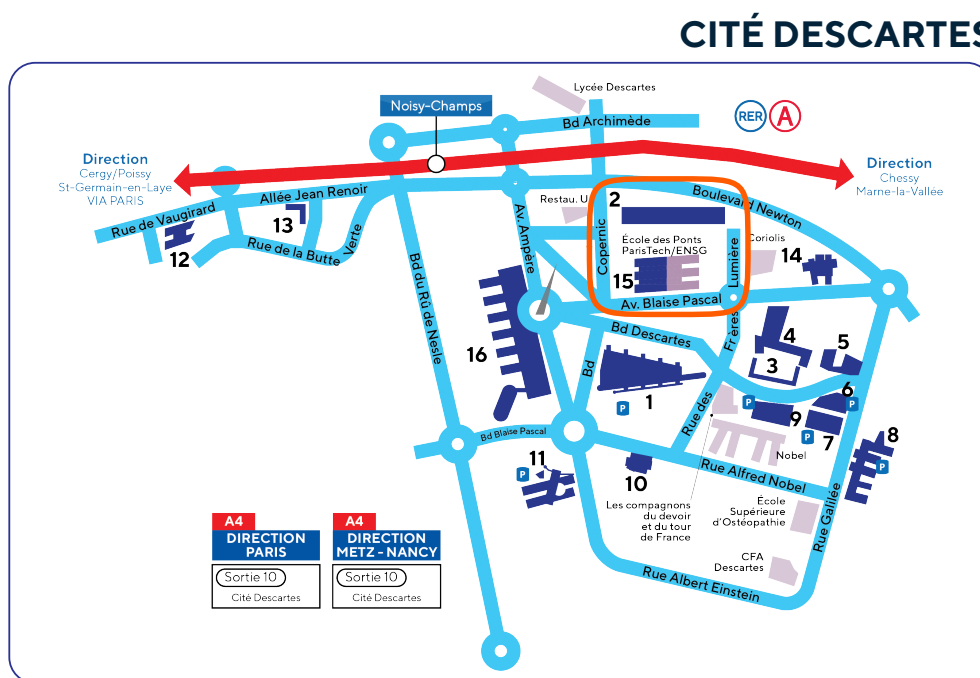
Conference venue - Université Gustave Eiffel

Location

- **Bienvenue building**, 14-20 Boulevard Newton, Champs-sur-Marne, 77 420 (see map below)
- **École des Ponts ParisTech/ENSG building**, 6-8 avenue Blaise Pascal, Champs-sur-Marne, 77 420 (see map below) for lunches

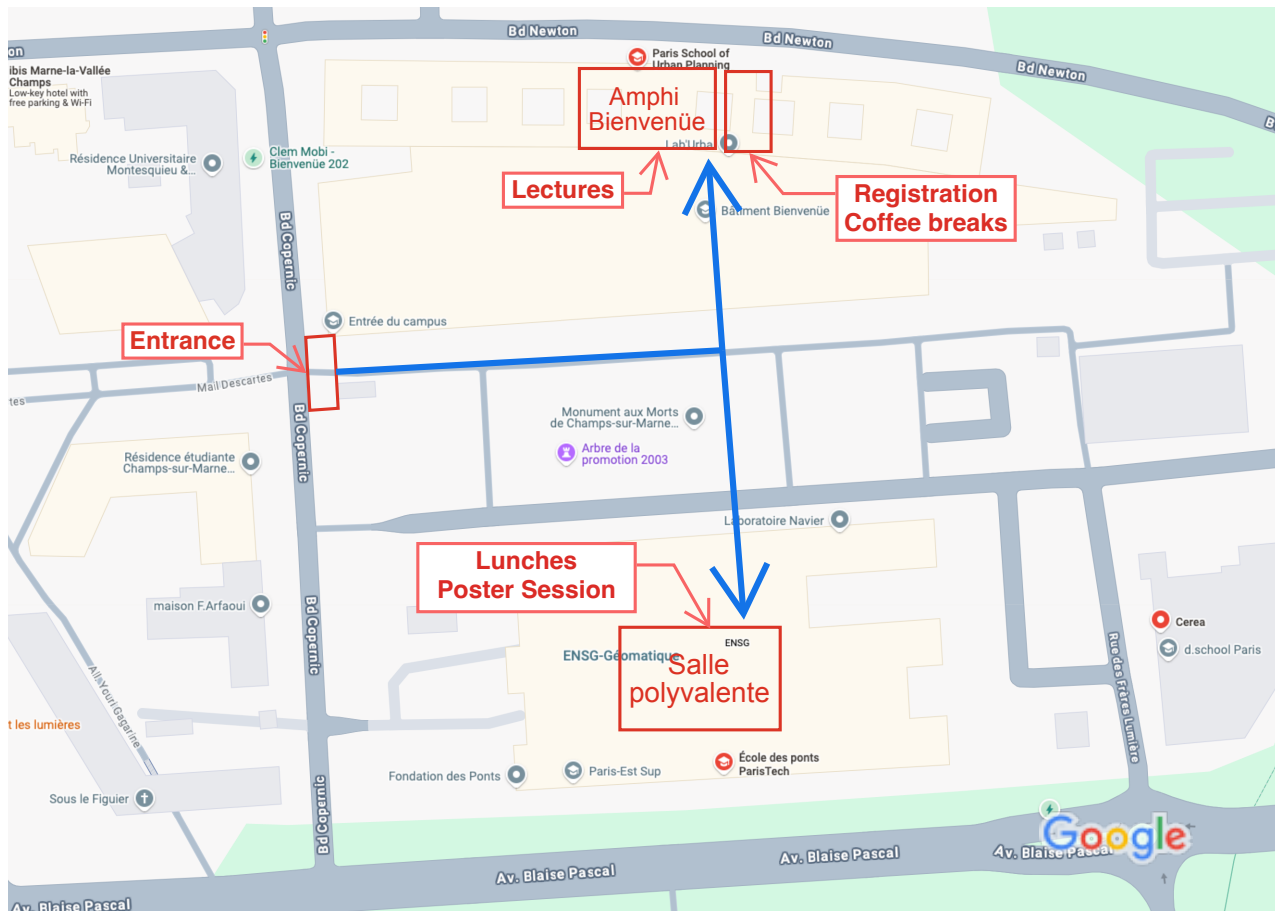
Transportation

- **Public transport:**  Noisy-Champs station, exit 3 “Cité Descartes”.
- **By car from Paris:** Take the Motorway A4 (direction Metz-Nancy), exit 10 “Champs-sur-Marne – Cité Descartes”, then turn left (3rd exit at the roundabout) towards “Cité Descartes” (road RN370).
- **By car towards Paris:** Take the motorway A4 (direction Paris), exit 10 “Champs-sur-Marne”, then take the first right towards “Cité Descartes” (road RN370).



1. **Bâtiment Copernic** : 5, bd Descartes • Champs-sur-Marne
2. **Bâtiment Bienvenue** : 14-20, bd Newton • Champs-sur-Marne
3. **Maison de l'Étudiant** : rue des Frères Lumière • Champs-sur-Marne
4. **Bibliothèque Georges Perec** : rue des Frères Lumière • Champs-sur-Marne
5. **Gymnase de la Haute Maison** : bd Descartes • Champs-sur-Marne
6. **Bâtiment François Rabelais** : bd Descartes • Champs-sur-Marne
7. **Bâtiment Lavoisier** : rue Galilée • Champs-sur-Marne
8. **Bâtiment Bois de l'Étang** : rue Galilée • Champs-sur-Marne
9. **Bâtiment Clément Ader** : bd Descartes • Champs-sur-Marne
10. **Bâtiment Ada Lovelace – La Centrif** : 2, rue Alfred Nobel • Champs-sur-Marne
11. **IUT de Marne-la-Vallée, site de Champs** : 2, rue Albert Einstein • Champs-sur-Marne
12. **Bâtiment Alexandra David-Néel** : 2, allée du Promontoire • Noisy-le-Grand
13. **Bâtiment Albert Camus** : 2, allée Jean Renoir • Noisy-le-Grand
14. **ÉAV&T** : 12, av. Blaise Pascal • Champs sur Marne
15. **ENSG Géomatique** : 6-8, av. Blaise Pascal • Champs sur Marne
16. **ESIEE Paris** : 2, bd Blaise Pascal • Noisy-le-Grand

Bienvenüe and École des Ponts ParisTech/ENSG buildings



Conference Banquet - Restaurant Flora Danica

Location

- 142 Avenue des Champs-Élysées, Paris, 75 008

Transportation

- Public transport:  Charles De Gaulle-Étoile station

Restaurant overview

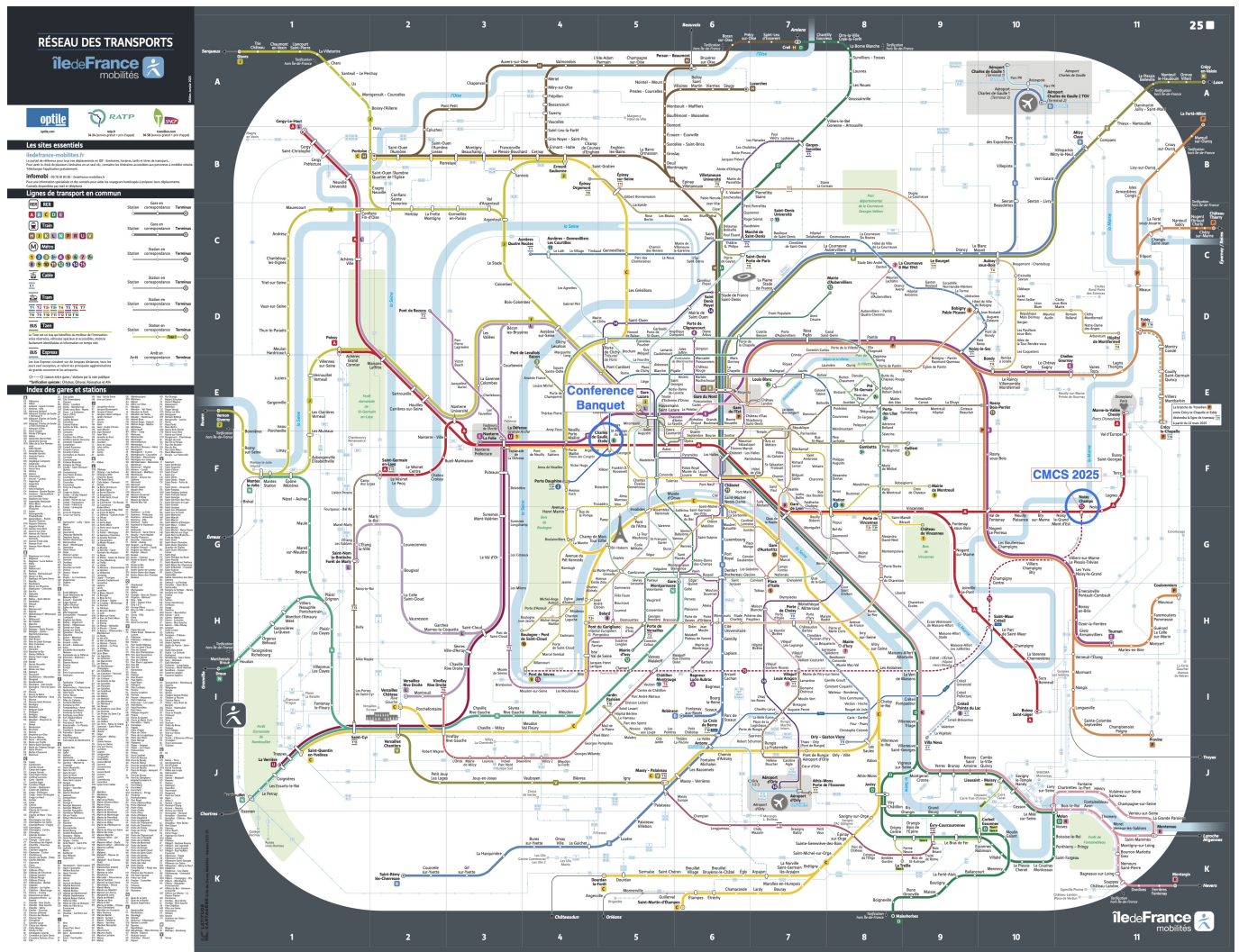


Web site: <https://www.floradanica.fr>

Champs-Élysées Avenue



Public Transportation map



Web site: <https://www.ratp.fr/en/plans-accessibles>