

New Trends in the Numerical Analysis of PDEs

Lille, June 10-13, 2024

INVITED SPEAKERS:

Emmanuel Creusé (Valenciennes)

Jérôme Droniou (Montpellier)

Geneviève Dusson (Besançon)

Virginie Ehrlacher (Paris)

Patrick E. Farrell (Oxford)

Francis Filbet (Toulouse)

Emmanuel Franck (Strasbourg)

Dietmar Gallistl (Jena)

Céline Grandmont (Paris)

Marien Hanot (Edinburgh)

Martin W. Licht (Lausanne)

Mario Ohlberger (Münster)

Ilaria Perugia (Vienna)

Francesca Rapetti (Nice)

Khaled Saleh (Lyon)

Iain Smears (London)

Eric Sonnendrücker (Munich)

Eitan Tadmor (College Park)

Andrea Thomann (Strasbourg)

Noel J. Walkington (Pittsburgh)

REGISTRATION AND POSTER SUBMISSION:

indico.math.cnrs.fr/e/napde



New Trends in the Numerical Analysis of PDEs

June 10th-13th 2024

Inria Center at the University of Lille

Monday, June 10th

📍 Amphitheater, Building B
Chair: Patrick E. Farrell

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- 12:30 Welcome buffet (Ground floor, Building B)
- 14:20 **Welcome speech**
- 14:30 **Ilaria Perugia**, Universität Wien
Structure-preserving discretization of nonlinear cross-diffusion systems
- 15:15 **Martin W. Licht**, EPFL
Computable reliable bounds for Poincaré–Friedrichs constants via Čech–de-Rham complexes
- 16:00 Coffee break (Ground floor, Building B)
- 16:30 **Emmanuel Creusé**, Université Polytechnique des Hauts-de-France
A posteriori goal-oriented error estimators based on equilibrated flux and potential reconstructions
- 17:15 **Francesca Rapetti**, Université Côte d’Azur
Basics for polynomial interpolation on simplices
- 18:00 End of session

Tuesday, June 11th

📍 Amphitheater, Building B
Morning Chair: Ilaria Perugia
Afternoon Chair: Francis Filbet

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- 09:30 **Eric Sonnendrücker**, Max Planck Institute for Plasma Physics & TU München
Hybrid compatible Finite Element and Finite Volume discretization for viscous and resistive MHD
- 10:15 Coffee break (Ground floor, Building B)
- 10:45 **Jérôme Droniou**, CNRS, Université de Montpellier & Monash University
The Exterior Calculus Discrete De Rham complex
- 11:30 **Marien-Lorenzo Hanot**, The University of Edinburgh
Polytopal methods on Riemannian manifolds
- 12:15 Lunch (W@else restaurant)
- 14:30 **Mario Ohlberger**, Universität Münster
Learning based reduction methods in the context of PDE constrained optimization
- 15:15 **Virginie Ehrlacher**, École des Ponts ParisTech & Inria Paris Centre
Global space-time low-rank methods for the time-dependent Schrödinger equations
- 16:00 **Eitan Tadmor**, FSMP and University of Maryland
Runge–Kutta methods are stable
- 16:45 Coffee break (Ground floor, Building A)
- 17:15 **Poster session** (Plenary room, Building A)
- 19:30 End of session

Margherita Castellano, École Polytechnique

A finite volume method for Cahn–Hilliard equations with surfactants

Jean Cauvin-Vila, TU Vienna

Structure-preserving finite volume approximation of cross-diffusion systems coupled via a moving interface

Farah Chaaban, ENSTA Paris

A volume optimal control-based numerical method for 2D time-harmonic Maxwell's equations with sign-changing coefficients

Amélie Dupouy, Centre Inria de l'Université de Lille

Theoretical and numerical analysis of a diffusion problem on a moving domain

Youssef Essadaoui, ENSA Khouribga - Université Sultan Moulay Slimane

Convergence to equilibrium for a sinc-type model surface growth model

Maxime Jonval, Centre Inria de l'Université de Lille & IFPEN

Parametrization and Cartesian representation techniques for robust resolution of chemical equilibria

Tino Laidin, Université de Lille

Conservative polynomial approximations and applications to Fokker–Planck equations

François Madiot, CEA Saclay

Criticality calculations in neutronics: model order reduction and a posteriori estimators

Christina Mahmoud, Université de Montpellier

Uniformly accurate schemes for hyperbolic relaxation systems

Ismail Merabet, Kasdi Merbah University Ouargla

Discontinuous finite element method for the contact problem of a linearly elastic shell

Julien Moatti, TU Vienna

A finite volume scheme for Maxwell–Stefan systems using Bott–Duffin inverse

Jia Jia Qian, Monash University

Discretisations of exterior calculus models from physics

Marwa Salah, Université de Montpellier

A serendipity fully discrete div-div complex on polygonal meshes

Wednesday, June 12th

📍 Amphitheater, Building B
Morning Chair: Clément Cancès
Afternoon Chair: Jérôme Droniou

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- 09:30 **Noel J. Walkington**, Carnegie Mellon University
Modeling Multiphase Multicomponent Porous Flows
- 10:15 Coffee break (Ground floor, Building B)
- 10:45 **Céline Grandmont**, Inria Paris Centre & Université Libre de Bruxelles
Asymptotic analysis of a fluid-structure-porous layer coupled model near contact
- 11:30 **Geneviève Dusson**, CNRS, Université Bourgogne Franche-Comté
A nonlinear reduced model based on optimal transport for electronic structure calculations
- 12:15 Lunch (W@else restaurant)
- 14:30 **Francis Filbet**, Université Toulouse III - Paul Sabatier
On the approximation of the von Neumann equation in the semi-classical limit
- 15:15 **Emmanuel Franck**, Inria Centre at Université de Lorraine
Neural and hybrid methods for elliptic problems
- 16:00 Coffee break (Ground floor, Building B)
- 16:30 **Khaled Saleh**, Université Claude Bernard, Lyon 1
A multi-dimensional staggered scheme for the diffusive limit in the radiative transfer equation
- 17:15 **Andrea Thomann**, Inria Centre at Université de Lorraine
A structure-preserving semi-implicit IMEX finite volume scheme for ideal magnetohydrodynamics at all Mach and Alfvén numbers
- 18:00 End of session
- 20:00 Social dinner (L'Assiette du Marché)

Thursday, June 13th

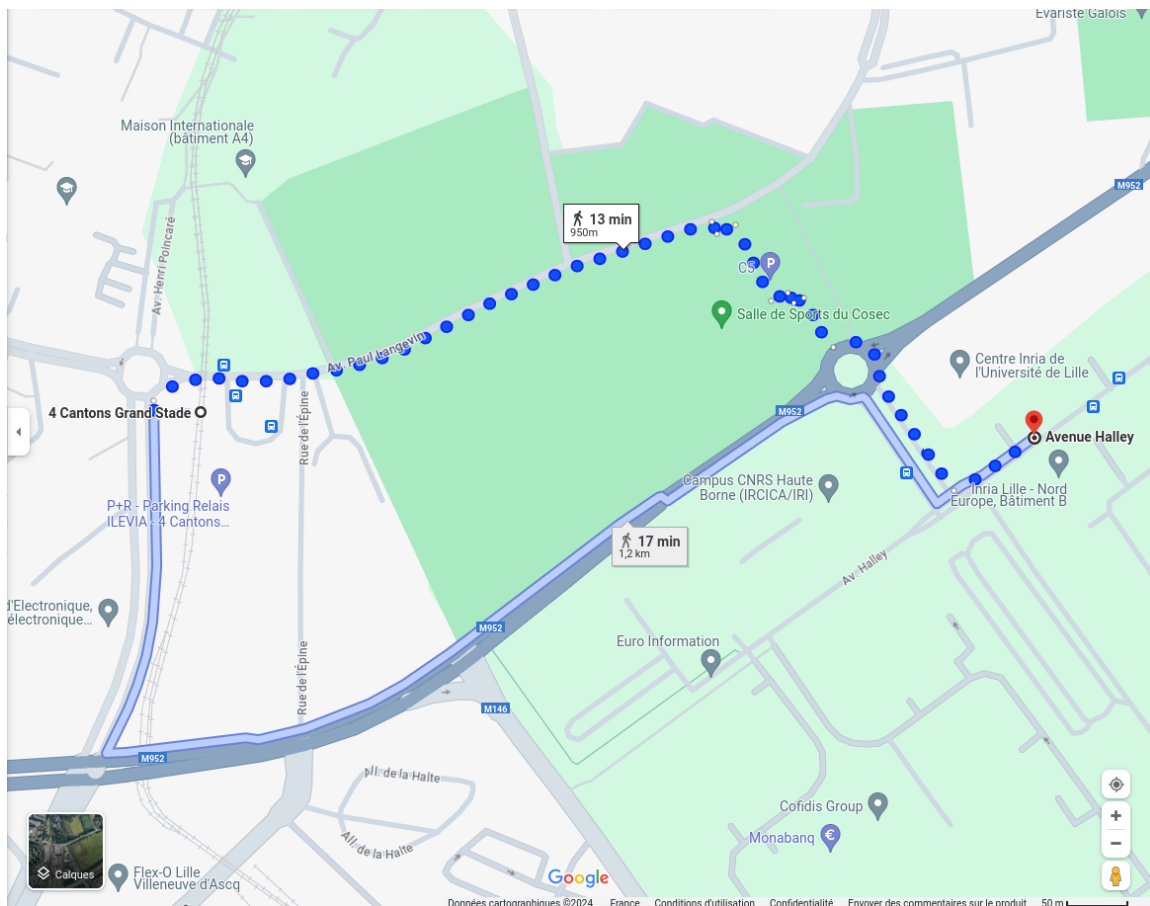
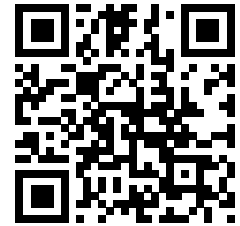
📍 Amphitheater, Building B
Chair: TBA

- 09:30 **Patrick E. Farrell**, University of Oxford
Designing conservative and accurately dissipative numerical integrators in time
- 10:15 Coffee break (Ground floor, Building B)
- 10:45 **Dietmar Gallistl**, Friedrich-Schiller-Universität Jena
A posteriori error control in the max norm for the Monge–Ampère equation
- 11:30 **Iain Smears**, University College London
Analysis and numerical approximation of mean field game partial differential inclusions
- 12:15 Workshop closing / Farewell buffet (Ground floor, Building B)

How to come to the Inria center?

The Inria center (Buildings A and B) is located in Villeneuve d'Ascq, in the east suburbs of Lille. The address is 40 avenue Halley.

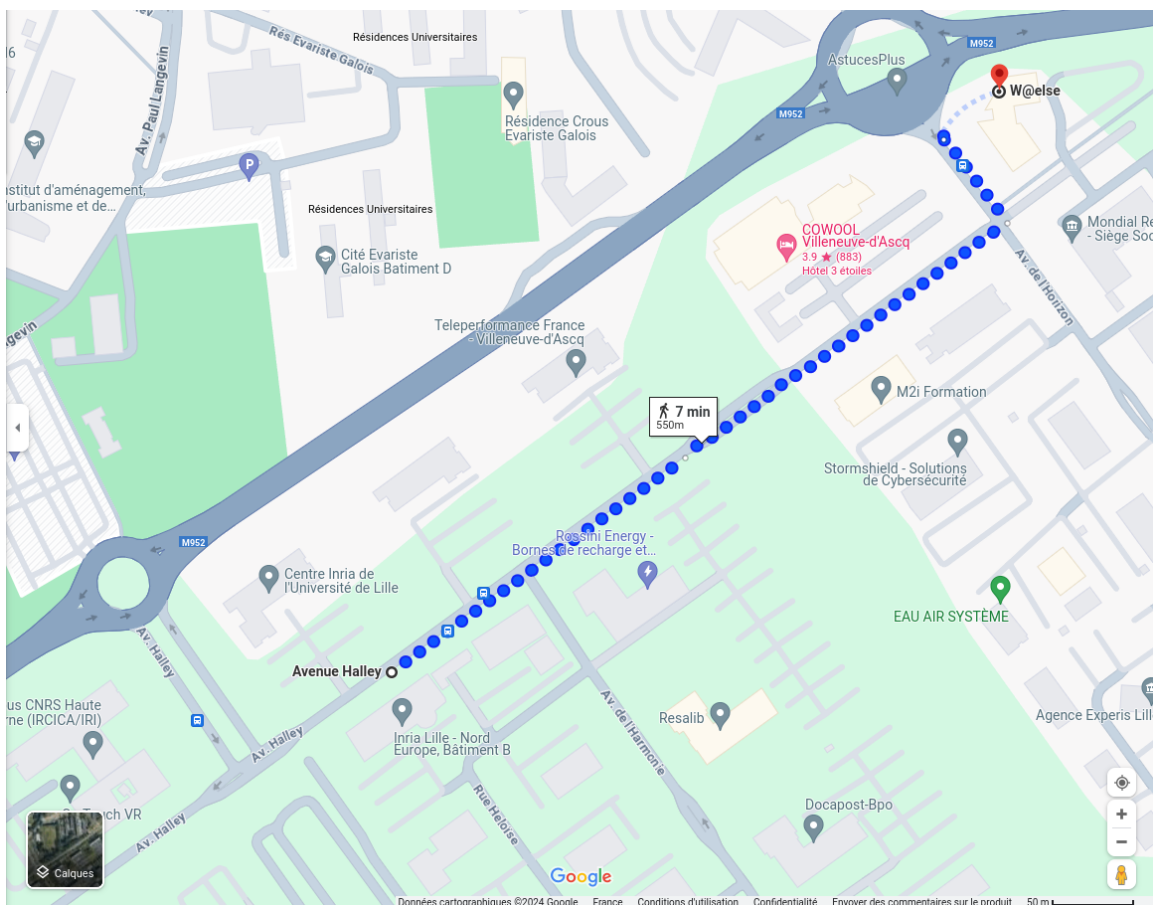
From Lille Flandres railway station in the city center of Lille, take the metro line M1 (yellow line) and stop at the terminus station *4 Cantons - Grand Stade*. Then, it is a 10-15 minute walk to reach the center.



How to get to the *W@else* restaurant?

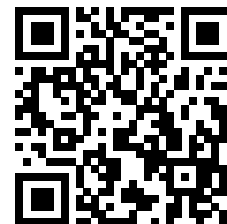
On Tuesday and Wednesday, lunch will be served at the *W@else* restaurant, located 2 avenue Halley.

To reach the restaurant from the Inria center, it is a 5-10 minute walk. We will all go there together after the morning sessions.

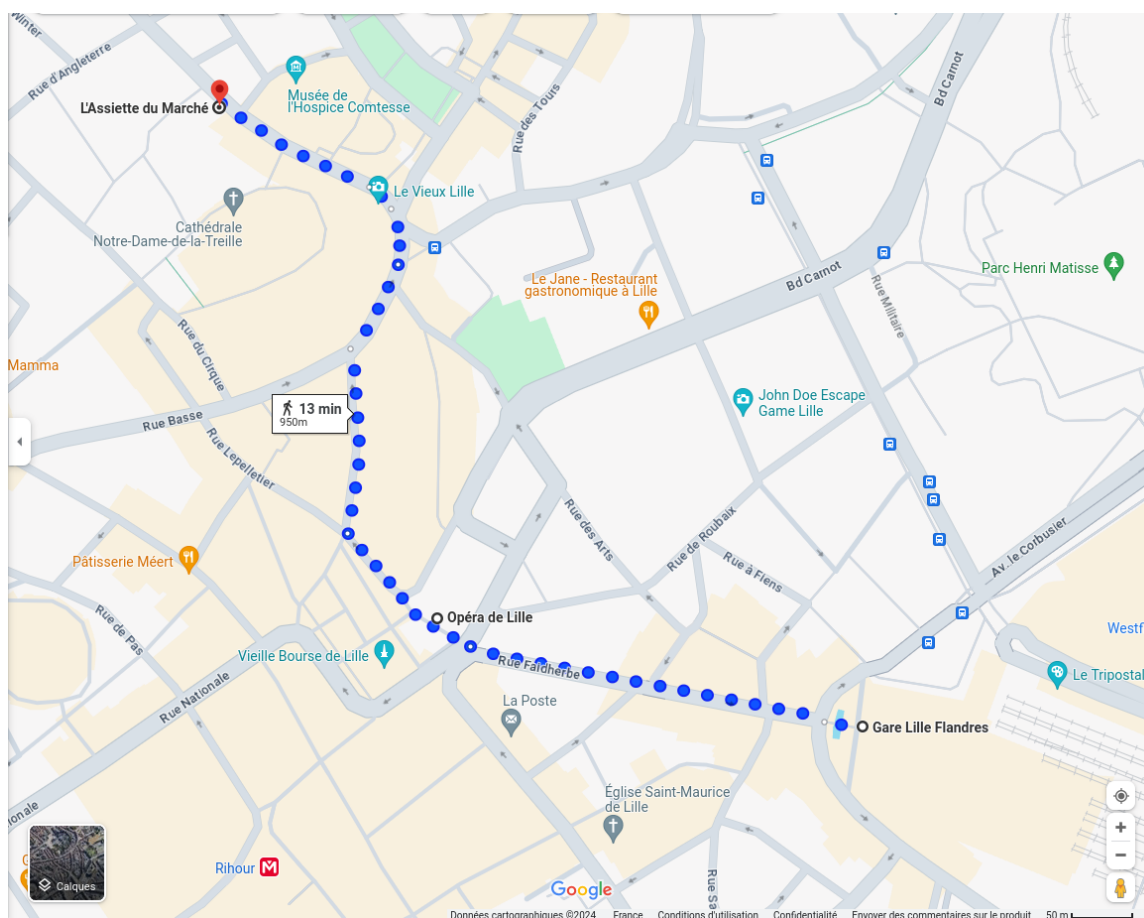


How to get to the restaurant *L'Assiette du Marché*?

The conference dinner will take place in the restaurant *L'Assiette du Marché*, located in the old city center of Lille, the so-called *Vieux-Lille*. The address is 61 rue de la Monnaie.



From Lille Flandres railway station, it is a 10-15 minute walk through the beautiful city of Lille.



Organizing committee

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