



UNIVERSITÉ DE LILLE

# Asymptotic behaviors of systems of PDEs arising in physics and biology - 5th edition -

June 5-9, 2023

# Asymptotic Behavior of systems of PDE arising in physics and biology: theoretical and numerical points of view

5th edition

June 5<sup>th</sup>-9<sup>th</sup> 2023 – Lille



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## 5<sup>th</sup> edition

June 5<sup>th</sup>-9<sup>th</sup> 2023 – Lille  
Polytech Lille

### Monday

📍 Amphithéâtre Migeon, Polytech Lille

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|-------|--|
| 13:30 | Welcome (Polytech main hall)   |
| 14:30 | <b>Jie Shen</b><br><i>Highly efficient energy stable schemes for dissipative systems and a new fully decoupled scheme with uniform second-order accuracy for Navier-Stokes equations</i> |
| 15:30 | <b>Greta Marino</b><br><i>A cross-diffusion system with Cahn-Hilliard terms: analysis and long time behavior</i>   |
| 16:00 | <b>Charles Elbar</b><br><i>Cahn-Hilliard system: From nonlocal to local</i>  |
| 16:30 | Coffee break (Salle Pasteur)   |
| 17:00 | ”Ice breaker” poster session (Salle Pasteur)   |



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- 09:30     **Joséphine Evans**  
*Convergence to equilibrium for linear run and tumble chemotaxis models*
- 10:30     **Pierre Gervais**  
*Hydrodynamic limits for kinetic equations: a spectral and unified approach*
- 11:00     Coffee break (Salle Pasteur)
- 11:30     **Sébastien Tran Tien**  
*Vanishing diffusion limit for aggregation equations*
- 12:00     **Carmela Moschella**  
*Vicsek-Kuramoto third order system in collective dynamics and their macroscopic equations*
- 12:30     **Bérénice Grec**  
*Rigorous derivation of the Fick cross-diffusion system from the multi-species Boltzmann equation in the diffusive scaling*
- 13:00     Lunch (Restaurant universitaire Sully)
- 14:30     **Jian-Guo Liu**  
*Asymptotic Analysis of Non-Equilibrium Chemical Reactions in the Thermodynamic Regime using WKB Method*
- 15:30     **Matthieu Brachet**  
*Time discretization on Cahn-Hilliard equations*
- 16:00     Coffee break (Salle Pasteur)
- 16:30     **Tim Laux**  
*Sharp-interface limits in the dynamics of phase transitions: from the Allen-Cahn equation to liquid crystals*
- 17:30     **Aissa Guesmia**  
*Cauchy systems of type Rao-Nakra sandwich beam with frictional dampings or infinite memories: some  $L^q(\mathbb{R})$ -norm polynomial stability estimates ( $q \in [1, +\infty]$ )*



- 09:30     **Daniel Matthes**  
*Covariance modulated optimal transport: geometry and gradient flows*
- 10:30     **Laura Kanzler**  
*Boltzmann mean-field game model for knowledge growth*
- 11:00     Coffee break (Salle Pasteur)
- 11:30     **Hélène Hivert**  
*Concentration in a population model structured in age and phenotypical trait : an asymptotic-preserving scheme*
- 12:00     **Rim Mheich**  
*Cahn-Hilliard Equation with Regularization Term*
- 12:30     **Senoussi Guesmia**  
*Asymptotic behavior of Lamé's system in large size noncylindrical domains*
- 13:00     Lunch (Restaurant universitaire Sully)
- 14:30     **Virginie Ehrlacher**  
*Cross-diffusion systems in moving boundary domains: discretization and optimal control*
- 15:30     Free afternoon / Visit in Lille
- 19:00     Conference dinner (Restaurant "L'Assiette du Marché")





# Thursday

📍 Amphithéâtre Lebon (morning),  
Amphithéâtre Migeon (afternoon)  
Polytech Lille

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- 09:30     **Lorenzo Pareschi**  
*Asymptotic-preserving IMEX methods: bridging scales in hyperbolic and kinetic equations*
- 10:30     **Kévin Guillon**  
*Modelization and AP kinetic scheme for the 2D bi-temperature dimensionless Euler system in a plasma*
- 11:00     Coffee break (Salle Pasteur)
- 11:30     **Damien Prel**  
*Multiscale numerical schemes for the collisional Vlasov equation in the finite Larmor radius approximation regime*
- 12:00     **Federica Ferrarese**  
*Collective motion of birds: swarming dynamics with transient leadership*
- 12:30     **Tino Laidin**  
*Hybrid Kinetic/Fluid numerical method for the Vlasov-BGK equation in the diffusive scaling*
- 13:00     Lunch (Restaurant universitaire Sully)
- 14:30     **Steven Wise**  
*Doubly Degenerate Cahn-Hilliard Models of Surface Diffusion*
- 15:30     **Julien Moatti**  
*A high-order scheme for advection-diffusion preserving positivity and long-time behaviour*
- 16:00     Coffee break (Salle Pasteur)
- 16:30     **Matthieu Alfaro**  
*Long time behavior of the field-road diffusion model*
- 17:00     **Annamaria Massimini**  
*Finite volumes for a generalized Poisson-Nernst-Planck system with cross-diffusion and size exclusion*



- 09:30     **Amic Frouvelle**  
*Jumping in the middle, from alignment models to sexual population dynamics*
- 10:30     **Bao Ngoc Tran**  
*Rigorous derivation of Michaelis-Menten kinetics in the presence of diffusion*
- 11:00     Coffee break (Salle Pasteur)
- 11:30     **Quentin Chauleur**  
*Dynamics of the isothermal compressible Euler system with damping*
- 12:00     **Hélène Mathis**  
*Modelling compressible two-phase flows with surface tension*





## Poster session

📍 Salle Pasteur, Polytech Lille  
🕒 Monday 5<sup>th</sup>, 17:00-19:00

**Fakhrielddine Bader**

*Multi-scale unfolding homogenization method applied to bidomain and tridomain electro-cardiology models*

**Aymen Balti**

*Combining and Optimising the Innovative Cancer Therapies Based to the Mechanistic Modeling*

**Maxime Jonval**

*Robust resolution of chemical equilibrium by the methods of parametrization and cartesian representations*

**Zeinab Mohamad Ali**

*Polynomial stability of a transmission problem involving Timoshenko systems with fractional Kelvin-Voigt damping*

**Maxime Payan**

*Numerical and Theoretical Study of Patterns in a Chemotaxis Model*

**Alex Rossi**

*Instability of stationary solutions to Allen-Cahn type opinion formation models*

**Florian Salin**

*Numerical Analysis of Fractional Nonlinear Diffusion Equation on Bounded Domain*

**Niccolò Tassi**

*Asymptotic behaviour of a nonlocal Fokker-Planck equation*

**Luca Ziviani**

*$L^2$  Hypocoercivity methods for kinetic Fokker-Planck equations with factorised Gibbs states*

**Antoine Zurek**

*Explicit rates of convergence for the localization limit of some cross-diffusion systems*



# How to come to Polytech Lille

From Lille railway stations: take Line 1 subway and stop at station 4 Cantons - Pierre Mauroy.

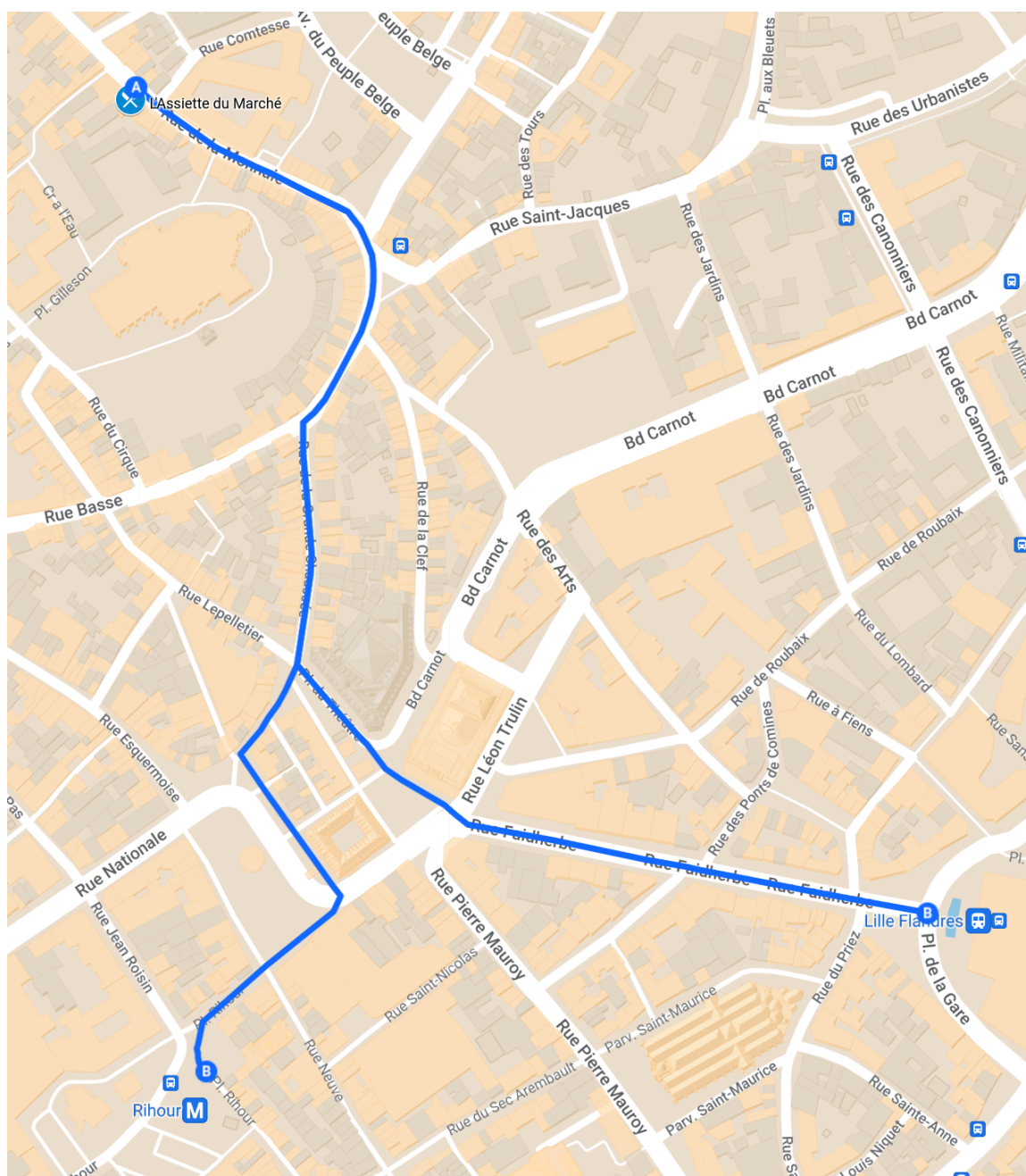


# How to come to the restaurant "L'assiette du Marché"

From Lille railway stations: take Line 1 subway and stop at station *Gare Lille Flandres* or *Rihour*.

If you come from Rihour, walk towards *Grand Place* and *Vieille Bourse* to find *Place du Théâtre*. From there, walk through *Rue de la Grande Chaussée*, then turn on the right through *Rue Basse* and you will find *Rue de la Monnaie* by continuing on the left.

The restaurant is located at 61, Rue de la Monnaie.



# How to access to Polytech work rooms

Two work rooms have been booked in Polytech Lille for the ABPDE participants who need some time and place for working. These rooms (A204 and A205) are located on 2nd floor of section *Aile A - Ader* of Polytech building.

- Salle Pasteur (coffee breaks, poster session)
- Amphithéâtre Migeon (talks)
- Rooms A204 and A205

