

MATHS M2 IN LYON

GROUPS, GEOMETRY, DYNAMICS AND MODEL THEORY

Basic courses (3 out of 4x24h):

- Introduction to ergodic theory and topological dynamics (Damien Gaboriau, Adrien Le Boudec)
- Lie groups and Lie algebras (Sophie Morel, Bruno Sévenec)
- Geometric group theory (Jean-Claude Sikorav)
- Model theory and its applications (Itai Ben Yaacov)

Advanced courses (3 out of 4x24h):

- Amenability and dynamics (Nicolás Matte Bon, Todor Tsankov)
- Lattices in semisimple Lie groups (Amine Marrakchi, Mikael de la Salle)
- Actions on trees and the elementary theory of free groups (Abderezak Ould Houcine)
- Model theory of groups (Frank Wagner)

MORE INFORMATION ON APPLICATION AND GRANTS IS AVAILABLE AT

[HTTP://MATHEMATIQUES.ENS-LYON.FR](http://mathematiques.ens-lyon.fr) **MASTER2**

PARTIAL DIFFERENTIAL EQUATIONS AND APPLICATIONS

Basic courses (3x24h):

- Evolution equations (Emmanuel Grenier)
- Calculus of variations and elliptic equations (Filippo Santambrogio)
- Discontinuous finite-element methods and applications (Daniel Le Roux)

Advanced courses (4x18h):

- Stochastic PDEs and their asymptotic behaviour (Alexandre Boritchev)
- Many-body quantum mechanics and mean-field limits (Nicolas Rougerie)
- Optimal transport theory and links with parabolic equations (Ivan Gentil)
- Numerical approximation methods for fluid mechanics (Khaled Saleh)

PROBABILITY AND STATISTICS

Basic courses (3 out of 4x24h):

- Concentration of measure in probability and high-dimensional statistical learning (Guillaume Aubrun, Aurélien Garivier, Rémi Gribonval)
- Non-parametrics (Irène Gannaz, Clément Marteau, Franck Picard)
- Stochastic calculus (Grégory Miermont)
- Statistical physics (Christophe Garban)

Advanced courses (4 out of 6x18h):

- Large random matrices and applications (Alice Guionnet)
- Determinantal processes (Adrien Kassel)
- Random graphs (Dieter Mitsche)
- Mathematical foundations of deep neural networks (Aurélien Garivier, Rémi Gribonval)
- Inverse problems and high dimension (Yohann de Castro, Rémi Gribonval)
- Advanced machine learning theory (Laurent Jacob, Antoine Chambaz).