Charlotte Perrin

Research interests

- Partial differential equations
- Fluid mechanics, Multi-phase flows
- Granular flows
- Singular limits

Contacts

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I am currently CNRS researcher at Institut de Mathématique de Marseille

Work Experiences

Current CNRS Researcher
Institut de Mathématique de Marseille (France)

2016-2017 Postdoc at "Institut für Mathematik" (Prof. Michael Westdickenberg)
RWTH Aachen University (Germany)
Teaching activities

2013-2016 Research at LAMA Laboratory, Le Bourget-du-Lac (France)
Three years of teaching activities at Savoie Mont Blanc University

April-July 2013 Research internship (M2): LAMA Laboratory, Le Bourget-du-Lac (France)
Some multi-fluid models

June 2012 **Agrégation de mathématiques** National Competitive Exam to recruit teachers in Mathematics

May-June 2011 Research internship (M1): IMT Toulouse (France)
Lyapunov's techniques for the study of diffusion models

May-June 2010 Research internship (L3): Leyden University (Netherlands)
The discrete logarithm problem

Education

2013-2016 Phd Student: LAMA Laboratory, Le Bourget-du-Lac, France
Supervisor: Didier Bresch
Heterogeneous models in fluid mechanics: congestion phenomena, granular flows and collective motion

2012-2013 **Research Master**: Université Claude Bernard (Lyon 1), ENS Lyon, Lyon
Speciality:*Partial differential equations*

2011-2012 **Master**: École Normale Supérieure de Cachan, Rennes
Preparation of the *French agrégation* in Mathematics

2010-2011 First year of **Master**: École Normale Supérieure de Cachan and University of Rennes
Mathematics

2009-2010 **Bachelor**: École Normale Supérieure de Cachan and University of Rennes
Mathematics

2007-2009 **Preparatory classes**: Lycée Saint-Louis, Paris

Publications and Conferences

Publications

[1] **C. Perrin** and M. Westdickenberg, "One-dimensional granular system with memory effects," *To appear in SIAM Journal of Mathematical Analysis*, 2018, nn.
[2] **C. Perrin**, "Modelling of phase transitions in one-dimensional granular flows," *ESAIM: Proceedings and Surveys*, vol. 58, pp. 78–97, 2017, nn.
[3] M. Fabre, S. Faure, M. Laurière, B. Maury, and **C. Perrin**, "Non-classical solution of a conservation law arising in vehicular traffic," *ESAIM Proceedings and Surveys*, vol. 55, pp. 131–147, 2016, nn.
[4] **C. Perrin**, "Pressure-Dependent Viscosity Model for Granular Media Obtained from Compressible Navier–Stokes Equations," *Applied Mathematics Research eXpress*, vol. 2016, no. 2, pp. 289–333, 2016, nn.
[5] **C. Perrin** and E. Zatorska, "Free/congested two-phase model from weak solutions to multi-dimensional compressible navier-stokes equations," *Communications in Partial Differential Equations*, vol. 40, no. 8, pp. 1558–1589, 2015, nn.
[6] D. Bresch, **C. Perrin**, and E. Zatorska, "Singular limit of a Navier–Stokes system leading to a free/congested zones two-phase model," *Comptes Rendus Mathematique*, vol. 352, no. 9, pp. 685–690, 2014, nn.

Preprints

[1] D. Bresch, S. Necasova, and **C. Perrin**, "Compression Effects in Heterogeneous Media," 2018, nn. Submitted.

Talks

Invitations in conferences

- MathFlows 2018, Porquerolles, September 2018
- Colloque franco-roumain, Bordeaux, August 2018
- Journées EDP, Obernai, June 2018
- Workshop on Kinetic and Fluid Partial Differential Equations, Paris, March 2018
- Workshop "Schémas numériques pour les écoulements à faible nombre de Mach", IMT Toulouse, November 2017
- Conference "Dispersive Hydrodynamics and Oceanography", les Houches, August 2017
- Conference "Vorticity, Rotation and Symmetry (IV) - Complex Fluids and Regularity Problems", CIRM Marseille, May 2017
- Journées Jeunes EDPistes français, Autrans, March 2017
- Seminar CEA-SMAI/GAMNI, IHP Paris, January 2017
- Conference MATHFLOWS 2017, Bedlewo (Pologne), January 2017
- Congress SMAI 2015, mini-symposium "Quantum models", les Karellis, June 2015
- Rencontres Doctorales Henri Lebesgue, Rennes, October 2014
- Conférence COMPFLOWS 2014, Bedlewo (Pologne), March 2014

Recent invitations in seminars

- Séminaire du laboratoire Jacques-Louis Lions, Paris, May 2018
- Séminaire d'analyse du laboratoire J. A. Dieudonné, Nice, March 2018
- Séminaire d'analyse, Université de Bâle (Suisse), March 2018
- Séminaire de l'équipe MIP, IMT Toulouse, December 2017
- Séminaire d'analyse, Université Catholique de Louvain (Belgique), November 2017
- Séminaire d'analyse, Institut Elie Cartan, Nancy, October 2017
- Oberseminar, Bonn University (Allemagne), June 2017
- Séminaire d'analyse appliquée, I2M Marseille, April 2017
- Séminaire d'analyse numérique et EDP, Laboratoire de Mathématiques d'Orsay, March 2017

Science Popularization

- **Amphis pour tous (February 2015, Savoie Mont Blanc University)** joint presentation with Didier Bresch : "Transhumances, traffic jams, the mathematics of collective motion"
- **Workshop "Maths à Modeler" (January-March 2014)** mathematical project in primary school with Tom Hirschowitz

Special Skills

- Programming Languages: Matlab, Scilab, basis in Python
- Office automation tools: Latex, Beamer

Languages

- French (mother tongue)
- English (conversational)
- German (basic)