

Boris HASPOT
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RESEARCHER IN PDE AND HARMONIC ANALYSIS

Present situation

Postdoc at University University Ruprecht Karls of Heidelberg in Germany under the direction of professor Jaeger from september 2008.

Education

- 2008-2010: Postdoc at University University Ruprecht Karls of Heidelberg in Germany under the direction of professor Jaeger.
- 2006-2008: ATER at Université Paris XII-Val de Marne.
- 2003-2007: PhD student at Université Paris XII-Val de Marne under the direction of Raphael Danchin (Allocataire de recherche and Moniteur).
- 2002-2003:
 - Master studies in DEA d'Analyse et de Géométrie, Université Paris VI Pierre et Marie Curie, Rank 1 on 30, distinction Très Bien.
 - Magistère de Mathématiques fondamentales, Université Paris-Sud XI.
- 2001-2002: Agrégation de Mathématiques option Analyse numérique, Université Paris XI Orsay.
- 1999-2001: Licence and Maitrise in Mathematics, Université Paris-Sud XI.

Degrees

- Agrégation de Mathématiques, Université Paris-Sud XI (2002).
- Magistère de Mathématiques, Université Paris-Sud XI (2003).
- Ph.D. in Mathematics, Université Paris XII-Val de Marne, 29 November 2007.
Thesis Advisor: Raphaël Danchin.
Thesis Title: "Etude d'équations liées à la mécanique des fluides compressibles capillaires"
with the following jury:
 - Sylvie Benzoni (Examiner, Institut Camille Jordan Université Claude Bernard Lyon 1)
 - Didier Bresch (Referee, LAMA Université de Savoie)
 - Frédéric Coquel (Examiner, Laboratoire Jacques-Louis Lions Université Paris VI)
 - Raphaël Danchin (Thesis supervisor, LAMA Université Paris XII)
 - Antonín Novotný (Referee, ANAM Université de Toulon et du Var)
 - Marius Paicu (Examiner, Département de mathématiques Université Paris-Sud)

Research interests

Partial Differential Equations and Harmonic Analysis:

- Density-dependent incompressible Navier-Stokes equations
Existence and uniqueness in finite time of strong solution in critical Besov space checking the scaling of the equation for Navier-Stokes equations, continuation criterion, Littlewood-Paley theory, paraproduct of J.-M. Bony, losing estimates for transport equation (limited loss of regularity and linear loss of regularity in Besov spaces), critical regularity.
- Compressible Navier-Stokes equations
-Existence and uniqueness in finite time of strong solution in critical Besov space checking the scaling of the equation for Navier-Stokes equations with general viscosity coefficients (in particular including the Shallow-water system), continuation criterion, Littlewood-Paley theory, paraproduct of J.-M. Bony, critical regularity.
-Existence of global weak solution with specific viscosity terms, regularity of Lions's solutions, gain of integrability on the velocity, uniqueness strong-weak solution, effective viscous flux, renormalized Diperna-Lions solutions, Orlicz spaces.
- Compressible fluids with capillarity
-Capillarity of Korteweg's type: Existence of global weak solution, control of the vacuum, gain of regularity on the density with technics of effective viscous flux and fractional derivatives, existence of strong solution in critical space for the non isothermal system.
-Capillarity of Rode's type describing discontinuous interfaces : Existence of global weak solution with pressure of Van der Waals type, existence of strong solution in critical space for the scaling of the equation, critical estimates on transport equation, uniqueness and logarithmic methods, Osgood's lemma.

Publications

- B. Haspot, Existence of solutions for compressible fluid models of Korteweg type, *Annales Mathématiques Blaise Pascal* **16**, 431-481 (2009).
- B. Haspot, "Cauchy problem for Navier-Stokes system with a specific term of capillarity" to appear in *M3AS*.
- B. Haspot, "Existence of weak solution for compressible fluid models of Korteweg type" to appear in *Journal of Mathematical Fluid Mechanics*.
- B. Haspot, "Cauchy problem for capillarity Van der Waals model" to appear in *PSAPM volume*, edited by Drs. Tadmor, Liu, Tzavaras, entitled "Hyperbolic Problems: Theory, Numerics and Applications."
- B. Haspot "Existence of global weak solution for compressible fluid models with a capillary tensor for discontinuous interfaces" accepted in *Differential and Integral Equations*.
- B. Haspot, "Local well-posedness results for density-dependent incompressible fluids in critical spaces" submitted,
- B. Haspot, "Well-posedness in critical spaces for barotropic viscous fluids" submitted.
- B. Haspot "Regularity of weak solution for compressible barotropic Navier-Stokes equations" submitted,
- J. Haïnk, B. Haspot and C. Rohde, "The initial-boundary value problem for non-Local Navier-Stokes-Korteweg models" preprint.

- P. Germain and B. Haspot, "Density-dependent incompressible viscous fluids in critical spaces" in preparation.
- F. Charve and B. Haspot, "Convergence of compressible capillary fluid models: from the non-local to the local Korteweg system" in preparation.
- B. Haspot and M. Paicu, "Existence of strong solution for Olroyd models", in preparation.
- B. Haspot, "Existence of global solutions for compressible Navier-Stokes system", in preparation.

Invited talks in seminars and conferences

- 04-22 Januar 2010: Invited for the Conference "Stress Tensor Effects on Fluid Mechanics" in the Morningside center of mathematics (Chinese academy of sciences) in Beijing.
- May 2009: Seminar in Rennes, "Existence of strong solutions in critical spaces for Navier-Stokes compressible system".
- May 2009: Seminar in Caen, "Existence of global weak solution for the Korteweg system".
- April 2009: Seminar in Evry, "Existence of strong solutions in critical spaces for Navier-Stokes incompressible with dependent-density".
- 4 Februar 2009: workshop in Aachen, "Existence of global weak solution for the Korteweg system".
- 1 November 2008: Invitation of C. Rohde in Stuttgart "Existence of strong solutions in critical spaces for Navier-Stokes incompressible with dependent-density".
- 15 Oktober 2008, seminar in Heidelberg: "Existence of strong solutions in critical spaces for Navier-Stokes incompressible with dependent-density".
- 2-6 June 2008: Colloque: " Equations aux dérivées partielles " à Evian.
- 19-23 May: CIRM in Marseille, Vorticit , Rotation et Sym trie Stabilit  des  coulements.
- 20 March 2008: Moad Lyon, "Existence de solutions fortes pour le syst me de Navier-Stokes compressible dans des espaces critiques" Organisatrice: Sylvie Benzoni.
- 6 March 2008: Invitation of C. Rohde, university of Stuttgart : "Cauchy problem for compressible capillary fluid models".
- 1 June 2007: Invitation of D. Bresch, universit  de Chamb ry. "Existence de solutions faibles globales pour le syst me de Korteweg".
- 17-23 October 2006: S minaire de m canique des fluides, CIRM in Marseille. "Les solutions fortes du syst me de Korteweg avec coefficients variables dans le cas non-isotherme".
- 20-25 July 2006: Eleventh international conf rence on Hyperbolic Problems, Theory Numerics, Applications (ENS Lyon). "Existence de solutions pour un mod le de fluide compressible non-isotherme de type Korteweg".

Research stay

- 4-16 April 2010: Invited in Zhejiang Normal University by Prof. Y. Zhou.
- April 2008: Invited in University of Stuttgart by Prof. C. Rohde (one week).

Attended conferences

- 13-15 December: Nonlinear PDE's to commemorate the works of J. Nečas in Prague.
- 5-9 June 2006: “ Equations aux dérivées partielles ” in Evian. Conference organizers: J-Y.Chemin, I. Gallagher.
- 24-25 March 2005: Journées fluides compressibles in Grenoble. Conference organizers: D. Bresch, E. Dumas.
- 7-11 June 2004: Colloque: “ Equations aux dérivées partielles ” in Forges-les-Eaux . Conference organizers: J-Y.Chemin, I. Gallagher.
- 14-16 January 2004: Workshop modèles d'interfaces diffuses in Lyon. Conference organizers: S. Benzoni-Gavage, R. Danchin, S.Descombes, D. Jamet.
- January 2004: Journées de travail à l'Université Paris 12-Val de Marne sur le thème: “ Collaborations Scientifiques avec les Universités parisiennes ”.

Skills

- French (mother tong), English (fluent), German (conversational level).
- Software: Microsoft Office, Matlab, Maple, Linux, Windows, Latex.
- Strong sense of responsibility and organizational skills.

Complementary informations

Representative in Ecole doctorale de l'Université Paris XII-Val de Marne 2004-2006.

Interests

Russian literature , Cinema, Theater, Travel , Swimming, Snowboarding.

Research references

- Didier Bresch, Professor (University of Savoie, France).
- Raphael Danchin, Professor (University Paris Est).
- Isabelle Gallagher, Professor (Paris VII).
- Willi Jaeger, Professor (university Karls Ruprecht Heidelberg).
- David Lannes, Directeur de recherches CNRS (DMA, École Normale Supérieure de Paris, UMR 8553).
- Christian Rohde, Professor (university of Stuttgart).

Teaching references

- Colette Guillopé, Professor and teaching director (University of Paris XII).