Curriculum Vitae

Mădălina Petcu

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Adrese profesionale: Institutul de Matematică al Academiei Române, 21 Calea Grivitei
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1 Experienţa profesională

2000–prezent: Cercetător la Institutul de Matematică al Academiei Române, Bucureşti (poziţia actuală: CP3 din 2008)

Septembrie 2007–prezent: Conferenţiar universitar, Laboratoire de Mathématiques, Université de Poitiers, Franţa

1 Noiembrie 2006–August 2007: Asistent postdoctoral la University of Geneva, Elveţia

1 Ianuarie–30 August 2006: Asistent cercetător (Attaché temperaire d'enseignement et de la recherche) la University of Paris-Sud, Orsay, Franţa

Semestrul de toamnă 2005: Asistent cercetător (Teaching instructor), Departmentul de Matematcă al Univesităţii Indiana, Bloomington, USA

2001– 2006, 2008– 2011: Cercetător asociat (Visiting Research Associate), Institute for Scientific Computing and Applied Mathematics, Indiana University, Bloomington, USA

1.1 Cursus universitar

2011: Abilitare (Habilitation à diriger des recherches, University of Poitiers)
Examen susţinut pe data de: 8 Decembrie 2011.
Titlul lucrării: *Modelisation, theoretical and numerical analysis of certain equations of mechanics and physics*
Juriu: Pierre Fabrie, Martin Gander, Olivier Goubet (referent), Alain Miranville, Frédéric Pascal, James Robinson (referent), Jean-Michel Rakotoson, Roger Temam

2002–2005: Teză de doctorat, directori de teză: Roger Temam (University of Paris-Orsay, Franţa) şi George Dincă (Universitatea Bucureşti).
Examen susţinut în: Mai 2005.
Titlul lucrării: *Regularity and asymptotics for the Primitive Equations*
Juriu: François Alouges, Jacques Blum, Benoît Desjardins (referent), George Dincă, Isabelle Gallagher (referent), Jacques Laminie, Roger Temam

1999–2001: Master în Analiză Reală şi Complexă, Facultatea de Matematică a Universitaţii din Bucureşti, România

2 Listă de publicaţii

2.1 Articole publicate

[1] M. Petcu, R. Temam, D. Wirosoetisno. Existence and regularity results for the primitive equations. *Comm. Pure Appl. Analysis*, 3(1):115–131, March 2004.

[2] M. Petcu, R. Temam. Control for the sine-Gordon equation. ESAIM: COCV, 10:553–573, 2004.

[3] M. Petcu. Gevrey class regularity for the primitive equations in space dimension 2. *Asymptotic Analysis*, 39(1):1–13, 2004.

[4] M. Petcu, A. Rousseau. On the δ-Primitive and Boussinesq type equations. *Advances in Differential Equations*, 10(5): 579–599, 2005.

[5] M. Petcu, R. Temam, D. Wirosoetisno. Renormalization group method applied to the primitive equation. *Journal of differential equations*, 208: 215–257, 2005.

[6] M. Petcu. Euler Equation in a channel in space dimension 2 and 3. *Discrete and Continuous Dynamical Systems* – series A, 13, no. 3, 755–778, 2005.

[7] M. Petcu, A. Rousseau. Numerical time-schemes for an ocean related system of PDEs. *Numerical Methods in Partial Differential Equations*, 22: 32–47, 2006.

[8] M. Petcu, D. Wirosoetisno. Sobolev and Gevrey regularity for the primitive equations in a space dimension 3, *Applicable Analysis*, 84(2005), no. 8, 769–788.

[9] M. Petcu. Euler equations in a 3D channel with nonhomogenous boundary conditions, *Differential and Integral Equations*, 19, no. 3, 297–326, 2006.

[10] M. Petcu. On the three-dimensional primitive equations, *Advances in Differential Equations*, 11, no. 11, 1201–1226, 2006

[11] M. Petcu. On the backward uniqueness of the primitive equations, *Journal de Mathématiques Pures et Appliquées*, 87, no. 3, 275–289, 2007

[12] B. Ewald, M. Petcu, R. Temam. Stochastic solutions of the two-dimensional primitive equations of the ocean and atmosphere, *Analysis and Applications*, 5, no. 2, 183–198, 2007

[13] M. Gander, M. Petcu. Analysis of the modified parareal algorithm for second-order ordinary differential equations, *AIP Conference Proceedings: Numerical Analysis and Applied Mathematics*, 233–236, 2007

[14] M. Gander, M. Petcu. Analysis of a Krylov subspace enhanced parareal algorithm, *ESAIM Proc.*, 25, pp.114–129, 2008

[15] M. Petcu, R. Temam. The Shallow Water equations with Dirichlet boundary conditions on the velocity, DCDS-S, vol. 4, no. 1, 2011

[16] L. Cherfils, M. Petcu, M. Pierre. A finite element discretization of the Cahn-Hilliard equation with dynamic boundary conditions, DCDS-A, vol. 27, no.4, 1511–1533, 2010

[17] K. Lucas, M. Petcu, A. Rousseau. Quasi-hydrostatic primitive equations for ocean global circulation models, *Chin. Ann. Math.*, 31B(5), 1–20, 2010

[18] C. Jung, M. Petcu, R. Temam. Singular perturbation analysis on a homogeneous ocean circulation model, *Analysis and Applications*, vol. 9, no. 3 (2011), 275–313

[19] S. Faure, M. Petcu, R. Temam, J. Tribbia. On the inaccuracies of some finite volume discretizations of the linearized Shallow Water problem, *International Journal of Numerical Analysis and Modeling*, vol. 8, no. 3, pp. 518–541, 2011

[20] M. Petcu, R. Temam. The Shallow Water equations with transparent boundary conditions , *Mathematical Methods in the Applied Sciences*, DOI: 10.1002/mma.1482, 2011

[21] A. Huang, M. Petcu, R. Temam. Supercritical Shallow Water equations with topography, *Annals of the University of Bucharest, Mathematics Section*, 2 (LX), 63–82, 2011

[22] M. Petcu. Exponential Decay of the Power Spectrum and Finite Dimensionality for Solutions of the Three Dimensional Primitive Equations, *Numerische Mathematik*, DOI 10.1007/s00211-011-0405-0, 2011

[23] M. Petcu, R. Temam. An interface problem: the two-layer Shallow Water equations, *DCDS-A*, vol. 33, no. 11 & 12, 5327-5345, 2013

[24] A. Bousquet, M. Marion, M. Petcu, R. Temam. Multilevel finite volume methods and boundary conditions for geophysical flows, *Computers&Fluids*, 74 (2013) 66–90

[25] A. Bousquet, M. Petcu, M. C. Shiue, R. Temam, J. Tribbia. Boundary conditions for limited area models, *Communications in Computational Physics*, vol. 14, no. 3, 664–702, 2013

2.2 Articole în pregătire

[26] M. Petcu, R. Temam, D. Wirosoetisno. Renormalization group method for the three dimensional primitive equations

[27] L. Cherfils, M. Petcu. A numerical analysis for the Cahn-Hilliard equation with non-permeable walls

[28] A. Huang, M. Petcu, R. Temam. The nonlinear $2D$ supercritical inviscid shallow water equations in a rectangle

[29] H. Israel, A. Miranville, M. Petcu. Well-posedness and long time behavior of a perturbed Cahn-Hilliard system with regular potentials

2.3 Cărți/Capitole în cărți

1. M. Petcu, R. Temam, M. Ziane. Some mathematical problems in fluid dynamics, *Handbook of Numerical Analysis* special volume on *Computational Methods for the Ocean and the Atmosphere*, 577-750, 2009

3 Participare la conferinţe internaţionale

Iulie 2013: AMS Meeting, Alba Iulia, Romania

Febr. 2013: AIMS workshop on "Stochastics in geophysical fluids", Palo Alto, USA

August 2012: 11ème colloque franco-roumain de mathématiques appliquées, Bucharest, Romania

Iulie 2012: The 9th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, Florida, USA

Sept. 2011: International Conference on Numerical Analysis and Applied Mathematics, Halkidiki, Greece

August 2010: 10ème colloque franco-roumain de mathématiques appliquées, Poitiers, France

Iunie 2011: The Seventh Congress of Romanian Mathematicians, Brasov, Romania

Iunie 2010: International Congress in Mathematical Fluid Dynamics and its Applications, Rennes, France

Iunie 2010: Conference on the honor of Prof. R. Temam, "Advances in Partial Differential Equations and their Applications", Shanghai, China

Mai 2010: The 8th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Dresden, Germany

Iunie 2009: Introductory course during the conference on "Analysis of Fluid Stability", Maxwell Institute, Edinburgh, UK

Mai 2009: 6th European Conference on Elliptic and Parabolic Problems, Gaeta, Italy

August 2008: 9ème Colloque Franco-Roumain de Mathématiques Appliquées, Brasov, Romania

Martie 2008: 9th IMACS International Symposium on Iterative Methods in Scientific Computing, Lille, France

Sept. 2007: International Conference on Numerical Analysis and Applied Mathematics, Corfu, Greece

Aprilie 2007: Colloque Numérique Suisse, Geneva, Switzerland

Febr. 2006: Workshop on Geophysical Fluid Dynamics, Palo Alto, USA

Dec. 2004: SIAM Conference on Analysis of PDEs (PD'04), Houston, Texas

4 Alte conferinţe şi prezentări

Febr. 2013: PDE seminar at IMAR, Bucharest, Romania

Mai 2012: PDE seminar at University of Geneva, Switzerland

Aprilie 2012: PDE seminar at University of Besançon, France

Martie 2012: PDE seminar at University of La Rochelle, France

Martie 2012: PDE seminar at University of Grenoble, IMAG, France

Martie 2012: PDE seminar at University of Picardie, Amiens, France

Dec. 2010: PDE seminar at University of Poitiers, France

Febr. 2009: Workshop, Poitiers, France

Noiembrie 2008: PDE seminar at Indiana University, Bloomington, USA

Oct. 2008: PDE seminar at University of Picardie, Amiens, France

Mai 2008: PDE seminar at Durham University, UK

Dec. 2007: PDE seminar at University of Orsay, France

Noiembrie 2007: PDE seminar at University of Poitiers, France

Martie 2007: PDE seminar at University of Nancy, France

Martie 2007: PDE seminar at University of Montpelliers II, France

Ian. 2007: PDE seminar at University of Geneva, Switzerland

Noiembrie 2006: PDE seminar at University of Illinois at Chicago, USA

Ian. 2006: Participation at the conference on "Analyse des Equations aux Dérivées Partielles", Evian, France

Mai 2006: Participation at CANUM (Congrès National d'Analyse Numérique), Guidel, France

Aprilie 2006: PDE seminar at University of Lille 1, France

Martie 2006: PDE seminar at University of Poitiers, France

Oct. 2005: PDE Seminar, Indiana University, Bloomington, USA

Mai 2005: SMAI Conference, Evian, France

Mai 2005: PDE seminar at Strathclyde University, Glasgow, Scotland

Aprilie 2005: Workshop on *Mathématiques et Océanographie*, Université Paris-Sud

5 Activităţi de popularizare a matematicii

- Sărbătoarea Ştiinţei (Fête de la Science), Octombrie 2010, Acţiune organizată de University of Poitiers
  Titlul prezentării: *Modelisation of fluid flows*

6 Incadrare de memorii, stagii de cercetare

- Coordonator de stagiu, Nivel master M2, 2009, student: Almokdad Nasr, University of Poitiers

- Coordonator de stagiu, Nivel master M2, 2010, student: Benjamin Moyet, University of Poitiers

- Coordonator de stagiu, Nivel master M1, 2010, studenţi: Adeline Choquet, Aurelia Leon, University of Poitiers

- Coordonator de memoriu de master M2, 2010, student: Heydi Israel, University of Poitiers

- Coordonator de stagiu, Nivel master M2, 2010-2011, studenţi: Adeline Choquet, Aurelia Leon, Thomas Ruffini, Mohamed Kaseb, University of Poitiers

7 Incadrare de teze de doctorat

- Haydi Israel, începând cu 2010, co-tutelă cu Alain Miranville, University of Poitiers

- Aimin Huang, începând cu 2010, co-tutelă cu Roger Temam, Indiana University, Bloomington

8 Editor şi referent

Editor la următoarele jurnale:

- Differential and Integral Equations

- Applied Mathematics and Optimization

- Asymptotic Analysis

Referent pentru următoarele jurnale:

- Discrete and Continuous Dynamical Systems

- Nonlinear Analysis. Real World Applications

- Journal of Computational and Applied Mathematics

- Differential Equations and Applications

- Indiana University Mathematics Journal

- SIAM Journal on Scientific Computing

- Domain Decomposition 21, Proceedings

- Proceedings of the Royal Society of Edinburgh

- Communications on Pure and Applied Analysis

9 Colaboratori

- Arthur Bousquet, Indiana University, Bloomington, USA
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- Carine Lucas, University of Orleans, France
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- Antoine Rousseau, INRIA (team MOISE)
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- Joseph Tribbia, NCAR, Boulder, USA
  National Center for Atmospheric Research, 3090 Center Green Drive, Boulder, CO 80301
  email: tribbia@ucar.edu, tel: (+01) 303 497 1377

- Ming-Cheng Shiue, National Chiao Tung University, Taiwan
  Department of Applied Mathematics, National Chiao Tung University
  1001 Ta Hsueh Road, Hsinchu 300, Taiwan
  email: mshiue@math.nctu.edu.tw, tel: 886 3 571 21 21 int: 56406

- Djoko Wirosoetisno, Durham University, UK
  Mathematical Sciences, Durham University
  CM322, Mountjoy Site, South Road, Durham DH1 3LE, United Kingdom
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- Mohammed Ziane, University of Southern California, Los Angeles, USA Department of Mathematics, KAP 108, University of Southern California
  Los Angeles, California 90089-1113, USA
  email: ziane@usc.edu, tel: (+01) (213) 740-3766

10   Alte responsabiliţi ştiinţifice

Membru al Comisiei de Specialiţi al Universitaţii din Poitiers, Laboratorul de Matematică

Membru în Consiliul Laboratorului de Matematică al Universitaţii din Poitiers

Co-organizator, împreună cu Laurence Cherfils şi Alain Miranville al simpozionului cu titlul:
"Mathematical Modelling and Numerical Methods for Phase-Field Problems"
în cadrul conferinţei:
"The 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications"
Madrid, Spania, 7 - 11 Iulie, 2014

Co-organizator, împreună cu Roger Temam şi Shouhong Wang al simpozionului cu titlul:
"Advances in Classical and Geophysical Fluid Dynamics"
în cadrul conferinţei:
"The 9th AIMS Conference on Dynamical Systems, Differential Equations and Applications"
Orlando, Florida, USA, 1 - 5 Iulie, 2012

Organizator al simpozionului cu titlul:
"Primitive Equations of the Ocean and of the Atmosphere"
în cadrul conferinţei:
"Mathematical Fluid Dynamics", Iunie 2010, Rennes

Co-organizator local al colocviului franco-român
"10ème colloque franco-roumain de mathématiques appliquées", August 2010, Poitiers

11 Prime

PES (prime d'excellence scientifique), primă obţinută la nivel naţional (perioada: 2012-2016)
PEDR (prime d'encadrement doctoral et de recherche), primă obţinută la nivel naţional (perioada: 2008-2012)