

Christos Sourdis

Date and place of birth: 23-09-1978, Athens, Greece.

Marital status: Married.

Military service: 35th Rangers Unit, Cyprus, 2009-2010. Honored by an *Ethics Award*.

Education

Bachelor degree: 1996-2000, Mathematics, University of Patras, Greece.

Masters degree: 2000-2003, Applied and numerical analysis, University of Athens, Greece.

Doctorate degree: 2003-2006, Existence of connecting orbits in singularly perturbed systems of differential equations, University of Athens (Adviser: N. Alikakos), Greece.

Current position

Research fellow, Department of Mathematics 'Giuseppe Peano', University of Turin, Via Carlo Alberto 10, 10123 Torino (Italy).

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Fellowships-Grants

- Marie Skłodowska-Curie Train to Move (T2M) fellowship (March 2015-February 2017).
- Chilean FONDECYT post-doctoral grant 2007-2009.

Scholarships

Greek state scholarship for phd studies (2003-2006), first prize in written examinations.

Employment

Visiting scholar: Department of mathematics, Michigan State University, Fall 2005.

Researcher: Department of mathematics, University of Tokyo, October and December 2006.

Researcher: Department of mathematics, University of Hokaido, November 2006.

Postdoctoral Fellow: Universidad de Chile, Departamento de Ingenieria Matematika, 2007-2009.

Visiting Lecturer: Department of applied mathematics, University of Crete, Spring semester 2011.

Postdoctoral Fellow: Archimedes center for modelling, analysis and computation (AC-MAC), University of Crete, 2011-2013.

Visiting Assistant Professor: Department of mathematics, University of Crete, Spring 2013.

Researcher: Department of mathematics and statistics, University of Cyprus, Fall 2013.

Postdoctoral Fellow: Department of mathematics and applied mathematics, University of Crete, 2014-2015.

Researcher (Invited professor): CNRS, Versailles, April 2014 and November-December 2014.

Scientific visits

University of North Texas, October 2002, Spring 2003 and November 2005.

University of Kyoto, December 2006.

Comenius University, Slovakia, March 2007.

North Carolina State University, May 2009.

University of Versailles, April and July 2013.

ULB, Brussels, 7-13 November 2015 and 24 June-1 July 2016.

Foreign Languages

English fluent (Proficiency Diploma of Cambridge and of Michigan), French (Certificate diploma, DELFs), Spanish (moderate), Italian (beginner).

Publications

1. A. Aftalion, C. Sourdis, *Interface layer of a two-component Bose-Einstein condensate*, to appear in *Communications in Contemporary Mathematics* (2016).
2. C. Sourdis, *A Liouville type result for bounded, entire solutions to a class of variational semilinear elliptic systems*, to appear in *Differential and Integral Equations* (2016).
3. C. Sourdis, *The heteroclinic connection problem for general double-well potentials*, *Mediterranean Journal of Mathematics* (2016), DOI: 10.1007/s00009-016-0770-0.
4. C. Sourdis, *Optimal potential energy growth lower bounds for minimizing solutions to the vectorial Allen–Cahn equation in two space dimensions*, *Mathematical Methods in the Applied Sciences* (2016), DOI: 10.1002/mma.4009.
5. C. Sourdis, *Analysis of an irregular boundary layer behavior for the steady state flow of a Boussinesq fluid*, to appear in *Discrete and Continuous Dynamical Systems-A* (2016).

6. C. Sourdis, *On the profile of globally and locally minimizing solutions of the spatially inhomogeneous Allen–Cahn and Fisher–KPP equation*, *Advanced Nonlinear Studies* **16** (2016), 67–73.
7. C. Sourdis, *On the existence of dark solitons of the defocusing cubic nonlinear Schrödinger equation with periodic inhomogeneous nonlinearity*, *Applied Mathematics Letters* **46** (2015), 123–126.
8. A. Aftalion, B. Noris, C. Sourdis, *Thomas-Fermi Approximation for coexisting two component Bose-Einstein condensates and nonexistence of vortices for small rotation*, *Comm. Math. Physics* **336** (2015), 509–579.
9. C. Sourdis, *On the growth of the energy of entire solutions to the vector Allen-Cahn equation*, *Comm. Pure Appl. Anal.* **14** (2015), 577–584.
10. G.D. Karali, C. Sourdis, *The ground state of a Gross-Pitaevskii energy with general potential in the Thomas-Fermi limit*, *Archive for Rational Mechanics and Analysis* **217** (2015), 439–523.
11. C. Sourdis, *On periodics from homoclinics in a slow-fast system with normally elliptic slow manifold*, *Mathematical Methods in the Applied Sciences* **37** (2014), 270–276.
12. G. Karali, C. Sourdis, *Resonance phenomena in a singular perturbation problem in the case of exchange of stabilities*, *Communications in PDE* **37** (2012), 1620–1667.
13. G. Karali, C. Sourdis, *Radial and bifurcating non-radial solutions for a singular perturbation problem in the case of exchange of stabilities*, *Ann. Inst. H. Poincaré Anal. Non Linéaire* **29** (2012), 131–170.
14. S. Schechter, C. Sourdis, *Heteroclinic orbits in slow-fast Hamiltonian systems with slow manifold bifurcations*, *J. Dynam. Differential Equations* **22** (2010), 629–655.
15. C. Sourdis, *A spectral bound for a class of Schrödinger operators*, *Bull. Greek Math. Soc.* **54** (2007), 269–272.
16. N.D. Alikakos, P.C. Fife, G. Fusco, C. Sourdis, *Singular perturbation problems arising from the anisotropy of crystalline grain boundaries*, *J. Dynam. Differential Equations* **19** (2007), 935–949.
17. C. Sourdis, P.C. Fife, *Existence of heteroclinic orbits for a corner layer problem in anisotropic interfaces*, *Adv. Differential Equations* **12** (2007), 623–668.
18. N.D. Alikakos, P.C. Fife, G. Fusco, C. Sourdis, *Analysis of the heteroclinic connection in a singularly perturbed system arising from the study of crystalline grain boundaries*, *Interfaces Free Bound.* **8** (2006), 159–183.

Preprints

19. C. Sourdis, *Uniform estimates of positive solutions of a class of semilinear elliptic equations and related Liouville and one-dimensional symmetry results.*
20. C. Sourdis, *Energy estimates for minimizers to a class of elliptic systems of Allen-Cahn type and the Liouville property.*

Teaching experience

- 2002-2006: Ordinary differential equations, Applied mathematics, Departments of Mathematics and Physics, University of Athens (in collaboration with A. Poulkou).
- 2005: Calculus 132 (Emerging scholars class), Michigan State University 2008.
- 2008: Contributed lectures in the Phd course “Navier Stokes Equations”, Universidad de Chile.
- 2011: Analysis II, Departments of Applied Mathematics and Mathematics, University of Crete.
- 2013: Mathematical methods for classical physics, Department of Mathematics, University of Crete.
- 2016: Existence and qualitative properties for solutions to nonlinear elliptic equations and systems, Department of Mathematics, University of Turin.

Students

2012: Supervised the undergraduate thesis of D. Zacharenakis entitled “*Invariant manifolds in dynamical systems*”, Departments of Applied Mathematics, University of Crete. He was subsequently accepted in the graduate programmes of applied mathematics in Athens (NTUA) and Crete (DMAM).

2014: Supervised part of the graduate thesis of D. Zacharenakis in the topic of *Lyapunov-Schmidt reduction methods for solving PDE's*, School of mathematical and physical sciences, NTUA, Greece. He is currently a phd student in the Univ. of Stuttgart.

Review and referee activity

- Reviewer for *AMS reviews* and *zbMATH*.
- Served as referee for the following journals: Journal of Differential Equations, SIAM Journal of Mathematical Analysis, Journal of Mathematical Analysis and Applications, European Journal of Applied Mathematics, Nonlinearity (twice), ESAIM: Control, Optimisation and Calculus of Variations (twice), Discrete and Continuous Dynamical

Systems - Series A, Mathematical Methods in the Applied Sciences, Applied Mathematics Letters, Journal of Evolution Equations, Springer PLUS, Abstract and Applied Analysis, Mathematics.

Talks

- International Conference on Influence of Traditional Mathematics and Mechanics on Modern Science and Technology, Messini, Greece, May 2004.
- Partial differential equations seminar, Michigan State University, October 2005.
- International Conference of Mathematical Methods in Science and Technology, Paros, Greece, 2006.
- Seminar of applied analysis, Tokyo University, Japan, October 2006.
- Workshop in applied analysis, Kusatsu, Japan, October 2006.
- Sapporo Nonlinear Science Center seminar, Hokaido University, Japan, November 2006.
- Dynamical systems seminar, Kyoto University, December 2006.
- Singularities Arising in Nonlinear Problems (SNP), Kyoto, Japan, December 2006.
- Qualitative theory of dynamical systems seminar, Comenius University, Bratislava, Slovakia, March 2007.
- Applied analysis and PDE seminar, University of Crete, Greece, April 2007.
- Differential equations seminar, Universidad Catholica, Santiago, Chile, September 2007.
- First Chile-Japan Workshop on Nonlinear Elliptic and Parabolic PDE, Santiago, Chile, 23-27 Oct. 2007.
- Applied analysis and PDE seminar, University of Athens, Greece, February 2008.
- Dynamics in Samos Conference, Samos, Greece, September 2010.
- Three days of analysis for young researchers, University of Athens, Greece, November 2010.
- Numerical and Applied Analysis seminar, University of Crete, March 2011.
- 14th Panhellenic Conference in Mathematical Analysis, Patras, Greece, May 2012.
- Modern Mathematical Methods in Science and Technology, Kalamata, Greece, August 2012.
- Laboratoire de Mathématiques de Versailles, April 2013.

- Analysis seminar, University of Crete, May 2013.
- Workshop on Nonlinear Schrödinger Equation: Theory and Applications, May 20 - 24, 2013, Heraklion, Crete.
- International Conference on Applied Mathematics, September 16-20, 2013, Heraklion, Greece.
- Analysis seminar, Department of Mathematics and statistics, University of Cyprus, November 2013.
- Analysis seminar, Department of Mathematics and Applied Mathematics, University of Crete, March 2014.
- Workshop on Contemporary Differential Geometry, Ioannina, Greece, 24-27 September 2014.
- Complex Patterns in Nonlinear Phenomena Conference with a day dedicated to Jacobo Pejsachowicz on the occasion of his 70th birthday, University of Turin, January 26-30, 2015.
- Analysis seminar, University of Turin, April 2015.
- Special session Nonlinear Elliptic Systems and Applications at Joint International Meeting of the American, European and Portuguese Mathematical Societies (AMS-EMS-SPM), Porto, 10–13 June 2015.
- Modern Mathematical Methods in Science and Technology, 30 August–1 September 2015, Kalamata, Greece.
- Calculus of Variations and PDEs Le Bourget du Lac, September 24–25, 2015.
- Partial differential equations seminar, ULB, Brussels, 13 November 2015.
- Bruxelles–Torino talks in PDE’s. Department of Mathematics ‘Giuseppe Peano’, University of Turin, May 2-5, 2016.
- Workshop on Interactions Between Dynamical Systems and Partial Differential Equations (JISD2016), Polytechnic University of Catalunya, July 11-15, 2016.
- Patterns of Dynamics, Free University of Berlin, 25-29 July 2016.

Posters

Workshop on “Domain Microstructure and Dynamics in Magnetic Elements”, Heraklion, Crete, April 8–11, 2013.

Conferences and workshops that I attended (without giving a talk or presenting a poster)

- "Patterns and Waves", Summer School, Athens, June 2003.
- "Nonlinear Dynamics, Chaos and Complexity", Summer School / Conference, Patras and ancient Olympia, July 2004.
- 10th Panhellenic Conference in Mathematical Analysis, Athens, October, 2004.
- International Conference on Differential Equations "Equadiff 11", Bratislava, July 2005.
- 2nd Workshop on elliptic and parabolic PDEs, Santiago, Chile, 3-7 September 2007.
- New Developments in Partial Differential Equations II (US-Chile workshop), Santiago, Chile, 7-10 January 2008.
- One-Day Workshops in PDEs I-V, Santiago, Chile, 2008-2009.
- 2009 SIAM Conference on Dynamical Systems, Utah, May 2009.
- III CLAM Congreso Latino Americano de Matematicos, Santiago, Chile, 31 Aug.-4 Sept. 2009.
- Woman in applied mathematics, Crete, May 2011.
- Workshop on Stochastic Partial Differential Equations, June 13-17 2011, Heraklion, Greece.
- Workshop on "Waves and imaging in complex media" Introductory part on June 7-8, 2012, and main workshop June 11-15, Heraklion, Crete.
- Workshop on "Semiclassical and multiscale aspects of wave propagation" May 28-June 1, 2012, Heraklion, Crete.
- Workshop on "Wave propagation in complex media and applications" May 7-11, 2012, Heraklion, Crete.
- Workshop on convex geometric analysis, Crete, September 2012.
- Complex and harmonic analysis, Crete, September 2012.
- Workshop on Cell biology and physiology: PDE models, October 4-6, 2012, Heraklion, Crete.
- Workshop on Software Frameworks for Challenging Computational Problems, January 14-18, 2013, Heraklion, Greece.
- Workshop on Geometric Computing, January 21-25, 2013, Heraklion, Greece.

- The 11th European Finite Element Fair, May 31-June 1, 2013, Heraklion, Crete.
- Workshop on Kinetic Description of Multiscale Phenomena, June 17-28, 2013, Heraklion, Greece.
- Workshop on Stochastic Methods in Finance and Physics, July 15-19, 2013, Heraklion, Greece.
- Three days on geometric PDEs, Mathematics Department, Politecnico di Milano, March 11, 2015–March 13, 2015.
- Mini-workshop "Nonlinear Meeting in Turin 2015", Department of Mathematics, University of Turin, June 16–17, 2015.
- Summer Course UIMP 2015, Santander (Spain), July 20-24, 2015.
- Workshop in Nonlinear PDEs Brussels, September 7-11, 2015.
- Mathematical models for suspension bridges, Mathematics Department, Politecnico di Torino, 17–18 September 2015.
- Autumn School on ODEs and Dynamical Systems, Department of Mathematics "Giuseppe Peano", University of Turin, November 24–27, 2015.
- Sixth Trilateral Meeting on Nonlinear Partial Differential Equations and Applications, December 14th - 18th, 2015, Parma.
- An Afternoon of Nonlinear Problems, January 27th, 2016, Department of Mathematics and Applications, University of Milano-Bicocca.
- Variational Perspectives, 8 March 2016, Politecnico di Torino.
- PDEs at the Grand Paradis, in Cogne (Aosta Valley) June 20-24, 2016.
- Nonlocal and nonlinear diffusions and interactions: new methods and directions Cetraro (CS) July 4-8, 2016.
- A Mathematical Tribute to Ennio De Giorgi, Pisa, 19 September 2016 - 23 September 2016.

Co-organization of conferences and workshops

Mathematical analysis and applications, University of Athens, May 2007. (with N. Alikakos).

Training on Soft Skills

- International School for Junior PI, Pietra Ligure, October 2015.
- MSCA - Individual Fellowship Infoday, University of Torino, 18th January 2016.
- Workshop 'Impact and Innovation in Horizon 2020', Turin 11/03/2016.

Sports

Bronze national medal in fin swimming.

Interests

music, movies, traveling.