CURRICULUM VITAE

Antonio Segatti

Contacts

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Research Interests

- Nonlinear Partial Differential Equations
- Geometric Analysis and Gradient flows in metric spaces
- Mathematical analysis of models of Liquid Crystals, Phase Transition and damage
- Infinite dimensional dynamical systems

Employment

1.08.2015 - present : Associate Professor of Mathematical Analysis, Department of Mathematics "F. Casorati", University of Pavia
29.12.2008 - 31.07.2015 : Assistant Professor of Mathematical Analysis with Tenure, Department of Mathematics "F. Casorati", University of Pavia
20.7.2006 - 28.12.2008 : Researcher at the Weierstrass Institute for Applied Analysis and Stochastics, Berlin

Visiting Positions

2016 Visiting Fellowship, Erwin Schrödinger Institute in Vienna
2015 Visiting Professor, Department of Mathematics, Universidad Autònoma, Madrid
2014 Visiting Fellowship, Isaac Newton Institute for Mathematical Sciences, Cambridge
2010 Visiting Fellowship, School of Mathematical Sciences, Fudan University, Shanghai

Education

PhD in Matematics (with highest honors), 30-1-2007, Univ. Milano (advisor P. Colli)
Diploma of the *Scuola Universitaria Superiore* (S.U.S), Pavia, 2002
Laurea in Matematica (with highest honors), 19-09-2002, Univ. Pavia
Languages: Italian (Native), English (Fluent).

Invited Lectures & Seminars

- Semiplenary Speaker
  - *Free Boundary Problems and Applications (Phase Fields model session), Shanghai, July 2017*
  - *XIX Conference of the Italian Mathematics Union (UMI)* (30 min. lecture), Bologna September 2011
- In conferences and workshops
  - *INdAM-ISIMM workshop Symposium on Trends in Application of Mathematics to Mechanics (STAMM)*, Rome September 2016
  - *ERC Workshop Modeling Materials and Fluids using Variational Methods*, Berlin February 2016.
  - *Infinite dimensional dynamics, dissipative systems and attractors*, Nizhny Novgorod July 2015.
  - *CIME course Mathematical Thermodynamics of complex fluids*, Cetraro (CS) June 2015 (invited seminar).
  - *Indam Workshop SMaCS-2015 Special Materials in Complex Systems*, Rome May 2015
  - *MFO Meeting on "Variational Methods for Evolution"*, Oberwolfach December 2014.
  - Special session on *Nonlinear evolution PDEs and interfaces in applied sciences* in the *10 th AIMS International Conference on Dynamical Systems and Differential Equations,* Madrid July 2014
  - Special session on *Variational methods for evolution equations* in the *10 th AIMS International Conference on Dynamical Systems and Differential Equations,* Madrid July 2014
  - *XXIV Convegno Nazionale di Calcolo delle Variazioni*, Levico, January 2014.
  - *CIRM-ERC Workshop DIMO2013 Diffuse Interface Models* , Levico, September 2013.
  - *IX Giornata di Studio Politecnico di Milano-Università di Pavia su Equazioni Dfferenziali e Calcolo delle Variazioni*, Pavia May 2013.

- *MathProSpeM2012 Mathematical Models and Analytical Problems in Special Materials*, Roma, April 2012
- *Journées Lions-Magenes*, Paris, December 2011
- *MFO Meeting on "Variational Methods for Evolution"*, Oberwolfach December 2011.
- *International Workshop on Phase Separation, Damage and Fracture*, WIAS, Berlin September 2011.
- *Interfaces and Discontinuities in solids, liquids and crystals*, Gargnano June 2011
- Special session on *Qualitative Behavior of Dissipative Dynamical Systems* in the *8 th AIMS International Conference on Dynamical Systems and Differential Equations,* Dresden May 2010.
- *Nonlinear evolution equations and mathematical modeling*, RIMS Kyoto, October 2009.
- Special session on *Thermodynamics and Phase Change* in the *7 th AIMS International Conference on Dynamical Systems and Differential Equations*, Arlington TX, May 2008.
- Special session on *Asymptotic Behavior of PDEs* in the *7 th AIMS International Conference on Dynamical Systems and Differential Equations*, Arlington TX, May 2008.
- *Matheon - ICM Workshop on Free Boundaries and Material Modelling*, WIAS Berlin March 2008
- *Mathematical Models and Analytical Problems for Special Materials*, Salò, July 2006.
- *Inverse and Direct Problems*, Cortona, June 2005.

- Invited Seminars in Universities and Research Institutes
  - Pavia
  - WIAS (Berlin)
  - Shanghai (Fudan U.)
  - Kobe
  - Tokyo (Waseda U.)
  - Montreal (Mc Gill U.)
  - Cambridge (Newton Institute)
  - Oxford (OxPDE)
  - Bath,
  - Madrid (Autónoma U.),
  - Münster

- Sissa (Trieste)

Grants

- Coordinator
  - Italian INDAM GNAMPA (2012): *Analisi Matematica per Flussi di Cristalli liquidi*
- Partecipant
  - CNR - Japan Society for the Promotion of Science (JSPS) Grant Innovative variational methods for evolution equations, 2014-2015, coordinator U.Stefanelli,
  - Italian Prin Grant (2010-2011): Calcolo delle Variazioni, coordinator G. Dal Maso.
  - CNR - Japan Society for the Promotion of Science (JSPS) Grant Innovative variational methods for evolution PDEs, 2012-2013, coordinator U. Stefanelli
  - Italian Prin Grant (2008-2009): Problemi di transizioni di fase e dinamiche relative, coordinator A. Visintin
  - DFG Priority Program 1095 (2004-2006): Analysis, Modeling and Simulation of Multiscale Problems, coordinator A. Mielke

Professional Service

- International referee for The Israel Science Foundation (ISF) 2016.
- Referee for: Calculus of Variations and Partial Differential Equations, Discrete and Continuous Dynamical Systems A & B & S ; Electronic Journal of Differential Equations, Journal Differential Equations, Journal of Functional Analysis, Journal of Mathematical Analysis and Applications, M2AS, M3AS, Nonlinearity, Siam Journal of Mathematical Analysis, Siam Journal of Numerical Analysis
- Commissions:
  - 2009 – 2012 Member of the commission of the Math. Department for the entrance examination of prospective students in Mathematics.
  - 2016 – 2019: Joint Committee of the Engineer Faculty.
- Organization:

- *17th Italian Meeting on Hyperbolic Problems, IPERPV17*, Pavia September 2017.
- *Two days Workshop on LC-flows*, Pavia 24-25 March 2014.
- *Mathematical Models and Analytical Problems for Special Materials*, Saló (Brescia) 9-11 July 2009
- *Applied Mathematics Seminar* of the Mathematics Department of the University of Pavia and IMATI CNR (Pavia), 2010-2014.

- Memberships: UMI (2002-2015), INDAM (2002-present), ISIMM (2014-present).

Teaching

- Graduate:
  - October/November 2015: Variational Models for Nematic Shells, PhD Course at Universidad Autónoma de Madrid
- Undergraduate:[1]
  - 2016 – 2017: Complementi di Analisi Matematica e Statistica (for Engineers)
  - 2016 – 2017: Calculus(for students in Biotechnology)
  - 2015 – 2016: Complementi di Analisi Matematica e Statistica (for Engineers)
  - 2015 – 2016: Trasformate di Fourier e Ottimizzazione (for BioEngineers)
  - 2015 – 2016: Calculus(for students in Biotechnology)
  - 2014 – 2015: Trasformate di Fourier e Ottimizzazione (for BioEngineers)
  - 2014 – 2015: Calculus(for students in Biotechnology)
  - 2013 – 2014: Calculus (for students in Biotechnology).
  - 2013 – 2014: Trasformate di Fourier e Ottimizzazione (for BioEngineers)
  - 2012 – 2013: Calculus (for students in Biotechnology).
  - 2011 – 2012: Mathematical Analysis and Computer Science (For students in Biotechnology).
  - 2010 – 2011: Teaching assistant and tutorial for the courses of Mathematical Analysis 1 & 2 (for students in Mathematics & Physics).
  - 2009 – 2010: Teaching assistant and tutorial for the courses of Mathematical Analysis 1 & 2 (for students in Mathematics & Physics).
  - 2008 – 2009: Teaching assistant and tutorial for the courses of Mathematical Analysis 2 (for students in Mathematics & Physics).

[1] In Italian

– 2001 – 2006: Tutorial for the courses of Mathematical Analysis (for students in Mathematics, Civil Engineer & Physics)

- Theses (co)-supervised:
  - Giacomo Canevari, Diploma in Mathematics, Univ. Pavia (2010). Phd in Paris. Now Post Doc in Oxford
  - Luca Calatroni, Master in Mathematics, Univ. Pavia (2011). PhD in Cambridge. Now Marie Curie Fellow at MIDA group, Math. Department Genova.

Collaborators A complete list of the authors I have collaborated (or I am collaborating) with is the following: G. Akagi (Kobe Univ.), E. Bonetti (Univ. Pavia), M. Bonforte (Univ. Autónoma Madrid), G. Canevari (Paris VI), P. Colli (Univ. Pavia), L. Freddi (Univ. Parma), M. Grasselli (Politecnico di Milano), C. Heinemann (WIAS, Berlin), M. Herrmann (Univ. Münster), C. Kraus (WIAS, Berlin), L. Mazzieri (SNS, Pisa), A. Miranville (Univ. Poitiers), E. Rocca (Univ. Milano & WIAS, Berlin), R. Rossi (Univ. Brescia), G. Savaré (Univ. Pavia), G. Schimperna (Univ. Pavia), M. Snarsky (Brown), L. Spinolo (Imati-CNR), U. Stefanelli (Univ. Vienna), J. L. Vázquez (Univ. Autónoma Madrid), M. Veneroni (Univ. Pavia), S. Zelik (Surrey), H. Wu (Fudan Univ., Shanghai).

Publications[2]
Mathscinet indexes 27 items from the following list, recording 192 citations from 138 authors (Apr. 2017)

- **Papers in refereed journals**

1. A. Segatti, Analysis of a solid-solid phase change model coupling hyperbolic momentum balance and diffusive phase dynamics. *Adv. Math. Sci. Appl*, **14**, no. 1, (2004), 327-349.
2. A. Segatti, Error estimates for a variable time-step discretization of phase transition model with hyperbolic momentum. *Numer. Funct. Anal. Optim.*, **25**, no. 5-6, (2004), 547-569.
3. E. Bonetti, G, Schimperna, *A. Segatti*, On a doubly nonlinear model for the evolution of damaging in viscoelastic materials. *J. Differential Equations* **14**, no. 1, (2005), 91-116.
4. A. Segatti, Global attractor for a class of doubly nonlinear abstract evolution equations, *Discrete Contin. Dyn. Syst.* **14** no. 4 (2006) 801-820.
5. R. Rossi, *A. Segatti*, U. Stefanelli, Attractors for gradient flows of non convex functional and applications,. *Arch. Ration. Mech. Anal.* **187** , no. 1, (2008), 91-135.

[2] ordered as submitted

6. G. Schimperna, *A. Segatti*, U. Stefanelli, Well posedness and long time behaviour for a class of doubly nonlinear evolution equations. *Discrete Contin. Dyn. Syst.* **18**, no. 1, (2007), 15-38.
7. A. Segatti, On the hyperbolic relaxation of the Cahn Hilliard equation in 3-D:approximation and long time behaviour. *M3 AS Math. Models. Methods. Appl. Sci.* **17**, (2007) no.3, 411-438.
8. G. Schimperna, *A. Segatti*, Attractors for the semiflow associated with a class of doubly nonlinear parabolic equations. *Asymptot. Anal.* **56** (2008) no.2, 61-86.
9. P. Colli, *A. Segatti*, Uniform attractors for a phase transition model coupling momentum balance and phase dynamics. *Discrete Contin. Dyn. Syst.*, **22**, (2008), 909-932.
10. M. Herrmann, *A. Segatti*, Infinite harmonic chain with heavy mass, *Comm. Pure Appl. Anal.* **9**, (2010), 61-75.
11. M. Grasselli, G. Schimperna, *A. Segatti*, S. Zelik, On the 3D Cahn Hilliard equation with inertial term, *J. Evol. Equ.* **9**, (2009), 371-404.
12. *A. Segatti*, S. Zelik, Finite-dimensional global and exponential attractors for the reaction-diffusion problem with an obstacle potential, *Nonlinearity* **22**, (2009), 2733-2760
13. R. Rossi, *A. Segatti*, U. Stefanelli, Global attractors for gradient flows in metric spaces, J. Math. Pures Appl. (9), **95**, (2011), 204–244.
14. L. Mazzieri, *A. Segatti* Constant σ_k-curvature metrics with Delaunay ends, Adv. Math. **229**, (2012), 3147-3191.
15. *A. Segatti*, H. Wu, Finite dimensional reduction and convergence to equilibrium for incompressible Smectic-A liquid crystal flows, SIAM J. Math. Anal **43**, no. 6, (2011), 2445–2481.
16. R. Rossi, G. Savaré, *A. Segatti*, U. Stefanelli, A variational principle for gradient flows in metric spaces, C. R. Math. Acad. Sci. Paris. **349**, (2011), 1224-1228.
17. G. Schimperna, *A. Segatti* and S. Zelik, Asymptotic uniform boundedness of energy solutions to the Penrose-Fife model, J. Evol. Equ **12**, (2012), 863-890.
18. A. Segatti, A variational approach to gradient flows in metric spaces, *Bollettino dell'Unione Matematica Italiana* **6**, (2013), 765–780.
19. G. Schimperna, *A. Segatti* and S. Zelik, On a singular heat equation with dynamic boundary conditions, *Asymptot. Anal.*, (2016), no.1-2, 27–59.
20. A. Miranville, E. Rocca, G. Schimperna and *A. Segatti*, The Penrose-Fife phase-field model with coupled dynamic boundary conditions, *Discrete Contin. Dyn. Syst.* **34** (2014), 4259–4290.
21. *A. Segatti*, M. Snarski, and M. Veneroni, Equilibrium configurations of nematic liquid crystals on a torus, *Phys. Rev. E* E 90 012501 (2014).
22. E. Bonetti, C. Heinemann, C. Kraus and *A. Segatti*, Modelling and analysis of a phase field system for damage and phase separation processes, *J. Differential Equations* **258** (2015), no. 11, 3928–3959.

23. G. Akagi, G. Schimperna and *A. Segatti*, Fractional Cahn-Hilliard, Allen Cahn and Porous Medium Equations, *J. Differential Equations* (2016), no.6, 2935–2985.
24. *A. Segatti*, M. Snarski, and M. Veneroni, Analysis of a variational model for nematic shells, *M3 AS Math. Models. Methods. Appl. Sci.*, (2016), no. 10, 1865–1918.
25. G. Canevari, *A. Segatti*, M. Veneroni, Morse's Index formula in BMO for compact manifolds with boundary, *J. Funct. Anal* 269 (2015), 3043–3082.
26. M. Bonforte, *A. Segatti*, J.L. Vázquez, Non existence and instantaneous extinction of solutions for singular nonlinear fractional diffusion equation, *Cal. Var. PDEs* (2016), no. 3, Art.68, 23pp.
27. E. Bonetti, L. Freddi and *A. Segatti*, Some analytical and computational results on a model for complete damage, *Contin. Mech. Thermodyn.* vol 29, no. 1, pp 31-50. (2017).

- **Preprints**

P.1 G. Akagi, G. Schimperna, *A. Segatti*, L. Spinolo, Stability under domain perturbations of the solution of the Dirichlet problem for the fractional laplacian, arXiv:1606.06489 [math.AP], submitted (2016).

P.2 S. Lisini, E Mainini, and *A. Segatti*, A gradient flow approach for a fractional porous medium equation, arXiv:1606.06787 [math.AP], submitted (2016).

P.3 G. Canevari, *A. Segatti*, Defects in Nematic Shells: a Gamma convergence discrete to continuum approach arXiv:1612.07720v2 [math.AP], submitted (2017).

- Proceedings:

Pr1. A. Segatti, Global attractors for the quasi stationary phase field model: a gradient flow approach, in *Free Boundary problems* Vol. 154 International Series of Numerical Mathematics, Birkhauser (2007), 381-390.

Pr2. *A. Segatti* and S. Zelik, Finite dimensional reduction for a reaction diffusion problem with obstacle potential, RIMS Institute Kokyuroku Publication, no. 1693, (2010), 1-10.

Pr3. A. Segatti, Elliptic regularization for gradient flows in metric spaces, Oberwolfach Report 55/2011, MFO Workshop 'Variational methods for evolution', (2011), 1:3178–3180.

Pr4. A. Segatti, Analysis of a variational model for nematic shells, Oberwolfach Report 57/2014, MFO Workshop 'Variational methods for evolution', (2014), 43–46.

Pr.5 G. Canevari, *A. Segatti*, Variational Analysis of Nematic Shells, Proceedings of the INdAM-ISIMM, Springer-INdAM series, submitted (2017).

Pavia, 7-7-2017,
Antonio Segatti