



Meet our Research Faculty

Dr. Gianluca Mola

PhD in Mathematics



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Name: Dr. Gianluca Mola

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Research Interests

The main topic where my research interests are collocated are the Partial Differential equations (PDEs) of evolution. In this general framework, I have been studying problems raising in two different areas: *inverse problems* of identification and *dynamical systems*. Both of these areas require a deep knowledge of recent developments on real and functional analysis, as well as possible extensions of the classic PDEs techniques.

Research Collaborations

Visiting Positions

January - February 2012 visiting fellow at University of Osaka (Japan)

January - February 2013 visiting fellow at the Institut Henry Poincaré, Paris (France), as a member of the RIP project *Identification of time-dependent constant in linear parabolic equations*

2013-2014 direction of GNAMPA research group *Problemi di identificazione di coefficienti in equazioni paraboliche lineari*

April - May 2014 visiting fellow at Tokyo University of Science (Japan)

April - May 2015 visiting fellow at Tokyo University of Science (Japan)

Conferences

Salò, 3-5 July, 2003 *Materiali speciali e memorie: problemi modellistici e analitici*

Rimini, 17-19 March, 2005 *DIPEE 2005-Direct and inverse problems in evolution equations*

Cortona, 20-24 June, 2005 *Inverse and direct problems*

Montecatini, 29-30 September, 2005 *Modellizzazione Matematica ed analisi dei problemi a frontiera libera*

Poitiers (France), 25-28 June, 2006 *AIMS '06*

Salò, 13-15 July, 2006 *Modelli matematici e problemi analitici per materiali speciali*

Levico Terme, 14-16 September, 2006 *Recent advances in free boundary problems and related topics*

Fukuoka (Japan), 7 August, 2007 *Joint Symposium of Real Analysis and Functional Analysis organized by Mathematical Society of Japan*

Kumamoto (Japan), 11 August, 2007 *Kumamoto workshop on Nonlinear Evolution Equations*, in honor of prof. I. Tanabe on the occasion of his 80th birthday

Cortona, 22-26 September, 2008 *Direct, inverse and control problems for PDEs*

Taranto, 28 June-3 July, 2009 *Evolution equations and mathematical models in the applied sciences*

Brescia, 9-11 July 2009 *Mathematical models and analytic problems for special materials*

London (UK)-Imperial College, 9-11 July, 2009 *7th ISAAC congress*

Rio de Janeiro (Brazil), 24-27 August, 2010 IX Workshop on Partial Differential Equations

Bologna, 1-4 September, 2010 PDEs, Semigroup Theory and Inverse Problems

Moscow (Russia)-PFUR, 22-27 August, 2011 8th ISAAC congress

Bologna, 16-20 July 2012 PDE's, Inverse Problems and Control Theory

Marseille (France), 5 February 2013 CMI, sminaire LATP (seminar)

Cortona, 17-21 June 2013 Differential Equations, Inverse Problems and Control Theory

Knoxville (TN, USA), 21-23 March 2014 Southeastern Spring Sectional Meeting of the American Mathematical Society

Bologna, 15-19 September 2014 PDE's, Control Theory and Inverse Problems

Parma, 6-10 July 2015 New advances in PDE's, Inverse Problems and Control Theory

Milano, 13-16 September 2016 SIMAI national congress

Cesena, 25-28 June 2019 Functional Analytic Methods for PDEs

Publications

Journal Articles

M. Conti & G. M. *Attractors for a phase field model on \mathbb{R}^3* , Advances in Mathematical Sciences and Applications **15**, No.2, pp.527-543 (2005)

G. M. *Global attractors for a three-dimensional conserved phase-field system with memory*, Communications on Pure and Applied Analysis **7**, No.2, pp.317-353 (2008)

G. M. *Convergence to equilibria for a three-dimensional conserved phase-field system with memory*, Electronic Journal of Differential Equations, No.23, pp.1-16 (2008)

J. Cholewa, R. Czaja & G. M. *Remarks on fractal dimension of bi-spaces global and exponential attractors*, Bollettino dell'Unione Matematica Italiana **1**, No.9, pp.121-145 (2008)

M. Conti & G. M. *3-D viscous Cahn-Hilliard equation with memory*, Mathematical Methods in the Applied Sciences **32**, No.11, pp.1370-1395 (2009)

G. M. & A. Yagi *A forest model with memory*, Funkcialaj Ekvacioj **52**, No.1, pp.19-40 (2009)

E. Mainini & G. M. *Exponential and polynomial stability for a first order linear Volterra evolution equation*, Quarterly of Applied Mathematics **67**, No.1, pp.93-111 (2009)

G. M. *Stability of global and exponential attractors for a three-dimensional conserved phase-field system with memory*, Mathematical Methods in the Applied Sciences **32**, No.18, pp.2368 - 2404 (2009)

A. Lorenzi & G. M. *Identification of unknown terms in convolution integro-differential equations in a Banach space*, Journal of Inverse and Ill-posed Problems **18**, No.3, pp.321-355 (2010)

M. Grasselli, G. M. & A. Yagi *On the longtime behavior of solutions to a model for epitaxial growth*, Osaka University Mathematical Journal **48**, No.4 (2011)

A. Lorenzi & G. M. *Identification of a real constant in linear evolution equations in Hilbert spaces*, Inverse Problems and Imaging **5**, No. 3 (2011)

G. M. *Identification of the diffusion coefficient in linear evolution equations in Hilbert spaces*, Journal of Abstract Evolution Equations and Applications **2**, No.1, pp.14-28 (2011)

A. Lorenzi & G. M. *Recovering the reaction and the diffusion coefficients in a linear parabolic equation*, Inverse Problems **28**, No.7 (2012)

G. M. *Recovering the Reaction Coefficient in a Linear Parabolic Equation*, Chapter 17 in New Prospects in Direct, Inverse and Control Problems for Evolution Equations, Springer (2014)

G. M., N. Okazawa, J. Prüss & T. Yokota *Semigroup-theoretic approach to identification of linear diffusion coefficients*, Discrete and Continuous Dynamical Systems - Series S **9**, No.3, pp.777 – 790 (2016)

G. M., N. Okazawa & T. Yokota *Reconstruction of two constant coefficients in linear anisotropic diffusion model*, Inverse Problems **32**, No.11 (2016);

S. Azizi, G. M. & A. Yagi *Longtime convergence for epitaxial growth model under Dirichlet conditions*, Osaka University Mathematical Journal **54**, pp. 691–708 (2017);

G. M. *Recovering a large number of diffusion constants in a parabolic equation from energy measurements*, Inverse Problems and Imaging **12**, No. 3, pp.527 – 543 (2018).