

## SHORT CV

Maria Rosaria Lancia

PRESENT POSITION: Associate Professor of Mathematical Analysis.

EDUCATIONAL BACKGROUND:

1988 Laurea in Mathematics 110/110 Magna cum laude, University of Rome La Sapienza.

FELLOWSHIPS: C.I.R.A. (Italian Center for aerospace research) fellowship 1987. C.N.R.(National Research Council) fellowship 1989.

ACCADEMIC CAREER: November 1991 -October 2005, Assistant Professor ( Mathematical Analysis) at the University of Rome La Sapienza . 1993, Ph.D. in Applied and Theoretical Mechanics. November 2005- present, Associate Professor in Mathematical Analysis.

RESEARCH INTERESTS: Dirichlet forms and fractals,functional spaces on d-sets, fractals, boundary value problems in domains with boundary and/or interface of fractal type.Non linear energy forms on unbounded self-similar fractal sets.Energy forms on non self-similar fractal sets. Heat diffusion on fractal domains. Semilinear, Quasilinear evolution problems in fractal domains, possibly with nonlocal terms with dynamical boundary conditions. Approximation of BVPS in fractal domains with dynamical BCNS. NON local models in smooth domains. Vector Analysis on Fractafolds .Shape optimization. Numerical approximation of some BVP's in Prefractal domains.Subelliptic operators of Hoermander type.Linear and non linear elasticity. BVPs in domains with edges and singularities: boundary integral formulations for some problems in fluidodynamics.

PROFESSIONAL SOCIETIES/ MEMBERSHIPS

UMI (Italian Mathematical Union) SIMAI (Italian Society of industrial Applied mathematics)GNAMPA (National Group of Mathematical Analysis, Propability and its applications)

PROFESSIONAL EXPERIENCE

Reviewer of AMS (Americal Mathematical Society)

Reviewer of J.of Computational physics, Physica D, Applicable Analysis,Mathematical Methods in the Applied Sciences, NORWA, ZAMM, DCDS series -B, JFA, DCDS-S

Reviewer for F.I.R.B.(M.I.U.R),A.N.V.U.R., Talent research, Re.Pri.Se

EDITORIAL BOARDS: Journal of Applied Mathematics and Computation, Hill Publishing Group; Fractal and Fractional, MDPI

MEMBERSHIPS OF RESEARCH PROJECTS/ACTIVITIES

COFIN 1998 Dirichlet forms and fractals,COFIN2003:Non linear differential problems algorithms, analysis and applications,COFIN 2005:Extension of continuum physics to non regular bodies. Progetti di ateneo 2000-2008,Progetti di ricerca Sapienza 2015 : Frattali dinamici e applicazioni. P.I. of Progetto di Ateneo Federato 2008: Heat diffusion on fractal domains, P.I. Progetto di Ateneo Federato 2009: Transmission phenomena across fractal structures. P.I.of Progetti di Ricerca di Universita' 2013 : Diffusion phenomena across fractal structures, P.I. of Progetti di Ricerca di Universita' 2014 : Fractal structures and Fluids. P.I. 2017: Boundary Value Problems with Integrodifferential Terms on Fractafolds. P.I.2018: Vector Boundary Value Problems on fractafolds. SEAL of EXCELLENCE MSCA IF 2018

INTERNATIONAL AGREEMENTS

Responsible of the International agreement between Sapienza and W.P.I. (USA) for research activities on fractal fibers and homogenization.

Responsible of International agreement between Sapienza and Steklov Mathematical Institute of Russian Academy of Sciences for research activities on PDEs in non regular domains.

MEMBERSHIPS of ACADEMIC BOARDS

Member of the academic board of the PhD in Mathematical Models for Engineering, Electromagnetics and Nanosciences

P.I. of INTERNATIONAL project : Fast diffusion across fractal interfaces ([https:// www.sbai.uniroma1.it](https://www.sbai.uniroma1.it) / Fast diffusion across fractal interfaces) main participants M.Hinz university of di Bielefeld, A.Teplyaev, University of Connecticut, A.Velez Santiago University of Puertorico, A.Nazarov University of St.Petersburg, Anna Rozanova-Pierrat Centrale Supelec Paris, U.Mosco WPI, MA Usa.

#### ORGANIZATION OF CONFERENCES AND MINYSIMPOSIA

- International Conference "Perspectives in PDEs, in honour of U.Mosco, Roma, 24-26 giugno 2009.
- International Conference " Homogenization : flows in collapsing domains and composite materials" Roma, 25-27 giugno 2012.
- Minicourse : "About the use of differential 1-forms on the Sierpinski Gasket and other fractals" prof. A.Teplyaev, University of Connecticut 15-16 aprile e 6 e 7 maggio 2015, Dept. SBAI
- Special session "Variational convergence and Degeneracies in PDES: fractal domains, composite media, dynamical boundary conditions", AIMS2016 Orlando, USA
- One day workshop on PDEs, in honour of Umberto Mosco, Rome May 28, 2019. (Coorganizers: D.Andreucci,R.Capitanelli, S.Carillo, M.A.Vivaldi)
- ICIAM 2019, minisymposium Fractals in Engineering (coorganizer Anna Rozanova Pierrat), Valencia, July 14-19, 2019

#### CONFERENCES, since 09-2000

- M.R.Lancia:" Nonlocal heat transfer across irregular interfaces" , Workshop on Analysis of nonlocal and non smooth models, Bielefeld March 25-29,2019
- M.R.Lancia:"Boundary value problems in irregular domains", MASCOT18, 15th MEETING ON APPLIED SCIENTIFIC COMPUTING AND TOOLS, October 2-5, Rome 2018.
- S. Creo, M.R.Lancia, P. Vernole, "Asymptotics for quasi-linear BVPs with dynamical boundary conditions in fractal domains"  
FIFTH WORKSHOP ON THIN STRUCTURES (Naples, September 13-15, 2018)
- M.R.Lancia:"Vector analysis on fractafolds: applications to some BVPs", SIMAI2018, in Complexity Reduction: Mathematical Modelling and Control. July 2-6 ,Rome 2018.
- M.R.Lancia:" Magnetostatic problems in fractal domains, 6th Cornell Conference on Analysis, Probability, and Mathematical Physics on Fractals, Ithaca USA, June 13-17, 2017.
- M.R.Lancia:" Venttsel problems in fractal domains", AIMS 2016, July 2016 Orlando, U.S.A.
- M.R.Lancia:"Regularity results for evolution problems with dynamical boundary conditions in a (pre-)fractal domain", COPDE, Munich 2015.
- M.R.Lancia "Numerical approximation of evolution problems in (pre)fractal domains", Seventh European conference on elliptic and parabolic equations , Gaeta, Italy June 2012

- M.R.Lancia: "Heat flow problems across fractal layers", Conference: New Function spaces in PDEs and Harmonic Analysis, Naples, Italy, May 31-June 4, 2011.
- M.R.Lancia: "An optimal mesh generation for domains with Koch type boundaries", MASCOT11, 11th Meeting on Applied scientific computing and tools, Rome, Italy October 19-21, (2011).
- M.R.Lancia, M.Cefalo, G.Dell'Acqua: "Numerical approximation of some conditioned heat flow problems across fractal layers", SIMAI 2010, Minisimposio Advances and challenges in Biomathematics and Bioinformatics, Cagliari, Italy June 21-25 2010.
- M.R.Lancia: "Irregular heat flow problems", Workshop on Asymptotic analysis and Stochastics methods for heterogeneous media, Alba Julia (Romania) June 9-13, 2010.
- M.R.Lancia: "Heat flow problems in varying Hilbert spaces", 6th European Conference on Elliptic and Parabolic Problems, Minisymposium: Degenerate structures and fractals, Gaeta, May, 25-29, 2009.
- M.R.Lancia: "Numerical approximation of heat flow problems across a Koch-type layer", Mathematical Modelling Mechanics and Materials, Udine 11-13 gennaio 2008.
- M.R.Lancia: "Heat Propagation across fractal layers", Analysis PDEs and Applications, on the occasion of Vladimir Maz'ya's 70th birthday, Roma, June 30 - July 3, 2008.
- M.R.Lancia: "Conditioned semigroups in some heat flow problems across fractal layers", Minisymposium: Differential modeling in applied sciences, SIMAI2008, Roma 15-19 September, 2008.
- M.R.Lancia: "Conduzione del calore attraverso strati frattali", Assemblea scientifica del G.N.F.M. Montecatini Terme, 11-13 ottobre 2007
- M.R.Lancia : "Parabolic transmission problems across irregular layers", International Symposium : Problemi attuali dell'analisi e della fisica matematica, Taormina, Italy June 29-July 1 2006.
- M.R.Lancia: "A constructive approach to some fractal transmission problems", S.I.A.M. Conf. on Analysis of P.D.E. Minisymposium :fractals, homogeneization and P.D.E., Boston July 10-12 2006.
- M.R.Lancia: "Convergence results for parabolic transmission problems across irregular layers.", Workshop on fractal analysis, Eisenach, September 2005,
- "Energy forms on non self similar fractals", Fifth European conference on elliptic and parabolic equations in honor of H.Brezis, Gaeta, Italy June 2004
- M.R.Lancia: "Fractal manifolds: results and open problems", Secondo incontro del Progetto GNAMPA-GNFM : Fisica su varietà Frastagliate, Roma, Italy Dept. Me.Mo.Mat. January 2004
- M.R.Lancia: "Variational convergence of singular energy forms associated with second order transmission problems with highly conductive layers" U.M.I. Conference, Milan, Sept. 8-13, 2003,
- M.R.Lancia: "On some second order transmission problems", Primo incontro del Progetto GNAMPA-GNFM : Fisica su varietà Frastagliate, Milano, Politecnico, May 2003,

- M.R.Lancia: "Variational convergence of singular energy forms related to transmission problems", International Conference: Fractal Geometry and Stochastics III, Friedrichroda, Marzo, 2003,
- M.R.Lancia "Problemi variazionali in domini non Euclidei", Conference " Recenti sviluppi nella teoria delle equazioni differenziali", Bologna, Italy, April 2002,
- M.R.Lancia "On the approximation of fractal transmission energies", SIMAI 2002, Chia Italy June 2002,
- M.R.Lancia: "A transmission problem with a fractal interface", SIMAI 2000, Ischia, Italy June 2000
- M.R.Lancia: "A transmission problem with a fractal layer", POTENTIAL THEORY AND DIRICHLET FORMS, Varenna Italy September 2000,