

Università di Roma “La Sapienza”
Dipartimento di Matematica “Guido Castelnuovo”

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POSITION

NOV. 2017 Associate professor at the University of Roma “La Sapienza”.

PREVIOUS POSITIONS

SEP. 2016-OCT. 2017 Professor at the University of Leipzig.

SEP. 2011-SEP. 2016 Research Group Leader at the Max Planck Institute for Mathematics in the Sciences Leipzig.

JAN. 2010-OCT. 2011 Postdoc at the Hausdorff Center for Mathematics of the University of Bonn.

OCT. 2006-DEC. 2009 Assistant at the University of Zürich.

RESEARCH AREAS

Geometric measure theory, calculus of variations and partial differential equations.

- Minimal surfaces and area-minimizing currents; regularity theory.
- Free boundary problems.
- Asymptotic analysis of variational models in applied mathematics.
- Existence, uniqueness and regularity of functionals in the calculus of variations.
- Isometric immersions and rigidity problems.
- Analysis of geometric flows.

AWARDS, GRANTS AND QUALIFICATIONS

FEB. 2018 ERC Starting Grant (ERC-2017-STG): HiCoS “Higher Codimension Singularities” (n. 759229, ca. 1350T €)

MARCH 2017 National scientific qualification for full professor in Italy: 01/A3 – Mathematical Analysis, Probability and Mathematical Statistics.

MAY 2015 Bartolozzi Prize of the Italian Mathematical Union.

SEPT. 2011 Grant for a five years Research Group of the Max Planck Society (ca. 650T €).

MAY 2010. Year Price of the Science Faculty at the Universität Zürich.

JAN. 2009. Forschungskredit of the Universität Zürich n. 57103701, two years grant (ca. 100T CHF).

EDUCATION

Università degli Studi di Pisa

B.SC. IN MATHEMATICS, June 2005, *cum laude*. Thesis: Rectifiable currents (in Italian).
Advisor: Prof. G. Alberti.

M.SC. IN MATHEMATICS, September 2006, *cum laude*. Thesis: A variational model for periodic pattern formation (in Italian).
Advisor: Prof. G. Alberti.

Scuola Normale Superiore di Pisa

M.SC. (LICENZA) IN MATHEMATICS, December 2007, *cum laude*. Thesis: Non-uniqueness for strictly polyconvex functionals.

Universität Zürich

PHD IN MATHEMATICS, May 2010, with a distinction and a money prize. Thesis: Q-valued functions and approximation of minimal currents.
Advisor: Prof. C. De Lellis.

PHD STUDENTS

Jan. 2012–Sep. 2016 Max-Planck-Institut MIS Leipzig: Philippe Logaritsch.
Thesis: *An obstacle problem for the mean-curvature flow*.

POSTDOC COLLABORATORS

June. 2012 – Aug. 2015 Max-Planck-Institut MIS Leipzig: Andrea Marchese (after assistant at the University of Zurich).

Jan. 2013 – Sept. 2015 Max-Planck-Institut MIS Leipzig: Katharina Bellova (after assistant at the University of Leipzig).

Sept. 2015 – Sept. 2016 Max-Planck-Institut MIS Leipzig: Francesco Ghiraldin (after post-doc at the University of Basel).

Sept. 2015 – Sept. 2016 Max-Planck-Institut MIS Leipzig: Luca Spolaor (after C. L. E. Moore Instructor at MIT).

TEACHING

- 2016/2017 University of Leipzig, master courses: Partial Differential Equations I and II.
- 2011/2016 MPI Leipzig, PhD courses: *Introduction to rectifiable currents, Regularity and Singularity in Obstacle problems, Elliptic partial differential equations: the minimal surface equation, Introduction to sets of finite perimeter*,
- 2011/2016 MPI Leipzig, reading seminars: *Singularities in minimal hypersurfaces, Parametric elliptic integrands, Navier–Stokes’ equations, De Giorgi’s method*.
- Course at the ERC-School on Geometric Measure Theory and Real Analysis, Pisa 30.09-04-10.2013: *Regularity of higher codimension area minimizing integral currents*.
- Course at the summer school in “Geometric Measure Theory and Optimal Transport” at ICTP Trieste 14.07-02.08.2013: *Regularity of minimal surfaces*.

- Winter School in Geometric Measure Theory, Scuola Normale Superiore di Pisa, January 2011: *The role of multi-valued functions in the regularity theory of minimal surfaces*.
- Teaching assistant at the Summer School Geometric Measure Theory and Applications at MSRI Berkely, July 2011.
- 2006/2010 Universität Zürich, teaching assistant:
 - Analysis I, II, III (held in German)
 - Functional Analysis
 - Geometry and Topology (held in German)

SELECTED INVITED TALKS OF THE LAST YEARS

- *Regularity of the thin obstacle problem*, Ninth Itinerant Workshop in PDEs, University of Bordeaux, 8-10.01.2018.
- *The structure of the free boundary of the thin obstacle problem*, PDE and Mathematical Physics Seminar, University of Zurich, 7.12.2017.
- *Regularity of the thin obstacle problem*, Harnack's inequalities and nonlinear operators. A conference to celebrate the 70th birthday of Emmanuele DiBenedetto, 18-23.6.2017.
- *Optimal regularity of three dimensional cones*, Geometry Seminar, University of Princeton 06.02.2017.
- *Optimal regularity of three dimensional cones*, Geometry Seminar, University of Postdam 10.09.2016.
- *An epiperimetric inequality for the thin obstacle problem*, Oberseminar Analysis RWTH Aachen, 09.02.2016.
- *Regularity of 2-dimensional almost minimal currents*, XXVI Convegno Nazionale di Calcolo delle Variazioni, Levico Terme (Trento) 19-22.01.2016.
- *Regularity of semi-calibrated 2-dimensional currents*, End of Year London Geometry Conference, King's College London 14-18.12.2015.
- *Lower semicontinuous functionals in the spaces of multiple valued maps*, Oberwolfach Mini-Workshop: Scales in Plasticity, 08-14.11.2015.
- *Lower semicontinuous functionals in the spaces of multiple valued maps*, Oberseminar Weierstrass-Institut (WIAS), 16.09.2015.
- *An epiperimetric inequality for the thin obstacle problem*, International workshop "Variational Analysis and Applications", Erice August 28 - September, 2015.
- *Regularity of 2-dimensional almost minimal currents*, Partial Differential Equations Seminar Oberwolfach 02-08.08.2015.
- *Equidimensional isometric maps*, Analysis seminar Duisburg-Essen 9.4.15.
- *An epiperimetric inequality for the thin obstacle problem*, Oxbridge PDEs workshop, Oxford 23-24.03.15.
- *An improved estimate for the singular set of Q -valued Dir-minimizing functions*, Geometry and Analysis seminar Imperial College, London 19.3.15.
- *Uniqueness of tangent cones of two-dimensional almost minimal currents*, Süddeutsches Kolloquium über Differenzialgeometrie, 11-12.07.14
- *Regularity of minimal surfaces*, analysis seminar Roma Tor Vergata, 1.4.2014.
- *Semicontinuous energied defined in the space of multiple valued maps*, workshop *Relaxation, homogenization and dimensional reduction in hyperelasticity* Paris 25-27.03.2014.

- *Regularity of minimal surfaces*, in *Two days of Hyperbolic PDEs, Geometric Measure Theory and Optimal transport* at SISSA Trieste 28-29.10.2013.
- *Regularity of higher codimension minimal surfaces*, Geometric analysis and PDEs seminar, University of Cambridge 27.05.2013.
- *Regularity of higher codimension minimal surfaces*, Vortrag im Kolloquium des Felix-Klein-Collegs, Universität Leipzig 16.01.2013.
- *Mean-curvature flow with obstacles*, ERC Workshop on Geometric Partial Differential Equations, Pisa 10-14.09.2012.
- *Droplet minimizers of a nonlocal variational problem*, Workshop on Variational Models and Methods for Evolution, Levico Terme 10-12.09.2012.
- *Regularity of minimal currents*, Meeting Applied Math. and Calculus of Variations, Università di Roma la Sapienza 04-07.09.2012.
- *Least barriers to minimal hypersurfaces: an approach via MCF with obstacle*, Variational Methods for Evolution Seminar Oberwolfach 07.12.2011.
- *On Almgren's center manifold and regularity of minimal surfaces*, PDEs Seminar Oberwolfach 08.08.2011.
- *The analysis of the higher codimension Plateau problem*, HCM- Hausdorff Kolloquium, Bonn 21.04.2011.

ACTIVITIES

- 2017- Member of the PhD committee at the University of Rome.
- 2016/2017 Member of the PhD committee at the University of Leipzig.
- Organization (with B. Kirchheim and S. Luckhaus) of the conference "Geometric Analysis, Free boundaries and Measure Theory", 15-17 June, Max-Planck-Institut Leipzig.
- 2015 Member of the Selection Committee for the Max Planck Research Groups for the year 2015/2016
- 2014 Member of the Selection Committee for the Max Planck Research Groups for the year 2014/2015