

Spolaor Luca

Curriculum Vitae

Personal Information

Name Luca Spolaor
Born March 4, 1988 - Verona (VR), Italy
Citizenship Italian
Work Address Massachusetts Institute of Technology, Building 2, 77 Massachusetts Avenue Cambridge, MA 02139-4307 (USA)
Office 2-241
mail lspolaor@mit.edu

Actual Position

Sep. **CLE Moore Instructor**, *Massachusetts Institute of Technology*, Cambridge, MA.
2016–Current

Education

Sep. **Postdoc**, *Max Planck Institute for Mathematics in the Sciences*, Leipzig, Advisor:
2016–Aug. Prof. Dr. Emanuele Spadaro.
2016
Sep. **Ph.D. Student**, *University of Zurich*, Advisor: Prof. Camillo De Lellis, Employed
2012–Aug. in the ERC project 306247: Regularity of area-minimizing currents.
2015 Thesis: Regularity Theory for a class of 2-dimensional almost area minimizing currents.
Sep. **Master in Mathematics**, *University of Trento*, Advisor: Prof. R. Serapioni,
2010–Jul. Mark: 110/110 cum laude.
2012 Thesis: Regularity Theory for Stationary Varifolds
Sep. **Bachelor in Mathematics**, *University of Trento*, Advisor: Prof. A. Defranceschi,
2007–Jul. Mark: 110/110 cum laude.
2010 Thesis: The Generalized Dirichlet Problem (in Italian)

Research Interests

My research deals with the Calculus of Variations and Geometric Measure Theory. In particular, in collaboration with De Lellis and Spadaro, we proved a sharp regularity result for some classes of almost area minimizing surfaces in arbitrary codimension. Subsequently, I generalized this result to semicalibrated currents in any dimension and codimension. Recently I became interested in the regularity of solutions to free-boundary problems.

List of publications

1. **Uniqueness of tangent cones for 2-dimensional almost minimizing currents**, *in collaboration with Camillo De Lellis and Emanuele Spadaro*, to appear in *Comm. Pure App. Math.*, 2016.
2. **Regularity theory for 2-dimensional almost minimizing currents I: Lipschitz approximation**, *in collaboration with Camillo De Lellis and Emanuele Spadaro*, to appear in *Transaction of AMS*, 2016.
3. **Regularity theory for 2-dimensional almost minimal currents II: branched center manifold**, *in collaboration with Camillo De Lellis and Emanuele Spadaro*, submitted, 2015.
4. **Regularity theory for 2-dimensional almost minimal currents III: blowup**, *in collaboration with Camillo De Lellis and Emanuele Spadaro*, submitted, 2015.
5. **Almgren's type Regularity for Semicalibrated Currents**, submitted, 2015.
6. **On the number of singular points for planar multivalued harmonic functions**, *in collaboration with Francesco Ghiraldin*, submitted, 2016.
7. **Quantitative estimate on singularities in isoperimetric clusters**, *in collaboration with Maria Colombo*, submitted, 2016.
8. **An epiperimetric inequality for the regularity of some free-boundary problems: the 2-dimensional case**, *in collaboration with Bozhidar Velichkov*, preprint, 2016.

Talks

- 07.05.2013 WHAT IS...THE FEDERER'S DIMENSION REDUCTION ARGUMENT, Graduate colloquium of the University of Zurich and ETH, Zurich
- 08.10.2013 UNIQUENESS OF THE TANGENT CONE TO 2-D ALMOST AREA MINIMIZING CURRENTS, ERC Workshop on Geometric Measure Theory, Analysis in Metric Spaces and Real Analysis, Pisa
- 27.01.2014 UNICITÀ DEL CONO TANGENTE PER CORRENTI 2-DIMENSIONALI QUASI MINIME DELL'AREA, XXIV Convegno Nazionale di Calcolo delle Variazioni, Levico Terme, Trento
- 10.10.2014 CALIBRATIONS AND THE PLATEAU PROBLEM, Arbeitsgemeinschaft ANGEWANDTE ANALYSIS, Max-Planck-Institut, Leipzig
- 17.12.2015 THE REGULARITY OF 2-DIMENSIONAL AREA-MINIMIZING INTEGRAL CURRENTS, University of Trento, Trento
- 21.01.2016 ON THE NUMBER OF SINGULAR POINTS FOR PLANAR MULTIVALUED HARMONIC FUNCTIONS, XXVI Convegno Nazionale di Calcolo delle Variazioni, Levico Terme, Trento
- 01.03.2016 REGULARITY RESULTS FOR SEMICALIBRATED CURRENTS, ETH, Zurich
- 10.03.2016 REGULARITY THEORY FOR TWO DIMENSIONAL ALMOST AREA MINIMIZING CURRENTS, Imperial College, London
- 15.03.2016 REGULARITY RESULTS FOR SEMICALIBRATED CURRENTS, Oxbridge, Cambridge

Teaching Experience

- 2011–2012 Tutor for the course Analysis I for the degree course of Mathematics at the University of Trento
- 2012–2015 Teaching Assistant for the courses Topology and Geometry, Analysis III and Stochastic for the degree course of Mathematics at the University of Zurich
- Fall 2014 Organiser of the Analysis Seminar for the degree course of Mathematics at the University of Zurich (held in German)
- 2015 Coadvisor of the master thesis of Andrea Huber at the University of Zurich
- Fall 2015 Co-organiser of the research seminar SINGULARITIES OF MINIMAL HYPERSURFACES at MPI (Leipzig)
- Fall 2016 Instructor for the course Calculus 18.01 (lecturer Prof. Speck) at MIT

Visits

- 2013–2014 Several visits at the Max Planck Institut for Mathematics in the Sciences, invited by Dr. Emanuele Spadaro

Awards

- 2012 Best graduated student of the University of Trento (with money prize)
- 2015 PhD thesis awarded with distinction (and money prize)

Languages

- Italian Mother tongue
- English Fluent
- German Intermediate

References

Camillo De Lellis

Department of Mathematics
University of Zurich
Winterthurerstrasse 190
CH-8057 Zuerich (Switzerland)
✉ camillo.delellis@math.uzh.ch
☎ +41 (0)44 6355840

Alessio Figalli

Department of Mathematics and ICES
The University of Texas at Austin
2515 Speedway Stop C1200
Austin, Texas 78712-1202 (USA)
✉ figalli@math.utexas.edu
☎ +1 (512) 475-8145

Guido de Philippis

Department of Mathematics
SISSA
Via Bonomea, 265
34136 Trieste (Italy)
✉ guido.dephilippis@sissa.it
☎ +39 040 3787 463

Emanuele Spadaro

Max-Planck-Institute
Inselstrasse 22
04103 Leipzig (Germany)
✉ spadaro@mis.mpg.de
☎ +49 (0) 341 9959 953

Ashkan Nikeghbali

Department of Mathematics

University of Zurich

Winterthurerstrasse 190

CH-8057 Zuerich (Switzerland)

✉ ashkan.nikeghbali@math.uzh.ch

☎ +41-(0)44-63 55857

Tobias H. Colding

Department of Mathematics

MIT

77 Massachusetts Avenue

Cambridge, MA 02139-4307 (USA)

✉ colding@math.mit.edu