

# Curriculum Vitae of Tommaso Pacini

(updated May 2014)

*Current position:* Ricercatore, Scuola Normale Superiore, Pisa.

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*Citizenship:* Italy/USA (dual).

## Education:

- Ph.D. in Mathematics, Univ. of Pisa, 2002.
- Laurea (equivalent to M.S.) in Mathematics, Univ. of Florence, 1996.

## Ph.D. thesis:

- Advisors: Gang Tian (MIT), Paolo de Bartolomeis (Univ. of Florence).
- Thesis title: *Flows and deformations of Lagrangian submanifolds in Kaehler-Einstein Geometry.*

## Recent appointments:

- Professore aggregato, Scuola Normale Superiore, 2012-2013.
- Ricercatore, Scuola Normale Superiore, 2009-onwards (tenured position).
- EU Marie Curie Research Fellow, University of Oxford, 2007-2009.
- EPSRC Research Fellow, Imperial College, 2006-2007.
- VIGRE Visiting Assistant Professor, Georgia Institute of Technology, 2003-2006.

## Major grants:

- Marie Curie ERG “reintegration grant” at SNS, 2010-2013: research funds.
  - Marie Curie EIF at University of Oxford, 2007-2009: salary plus research funds.
- Both grants above are project-specific. They are awarded by the Scientific Direction of the European Union after an extensive referee process.

## Other grants and fellowships:

- Participant in project PRIN 2010/2011, financed by MIUR, headed by F. Ricci (SNS).
- Participant in ERC Advanced grant, financed by ERC, headed by L. Ambrosio (SNS).
- Research Affiliate (with stipend), MIT, 2003 (3 months).
- EU EAGER fellowship, Imperial College, 2002 (7 months).
- Additional graduate funds to work at MIT as visiting student, 1999-2001.
- Undergraduate grant to study at Courant Institute (NYU), 1995 (Fall).

*Also:* EPSRC and VIGRE fellowships (see “recent appointments”, above) and SNS research funds (with Carlo Mantegazza and Lorenzo Mazzieri, 2011-2013, 2013-2015).

## Research interests:

- *Differential geometry*: manifolds with special holonomy; calibrated geometry.
- *Geometric analysis*: deformations and moduli spaces of calibrated submanifolds; desingularization procedures; gluing techniques; geometric flows.
- *Geometric PDE*: Geometric techniques in Optimal Transport; Hamiltonian PDE.

## Publications:

- 1) Lotay-Pacini, "Coupled flows, convexity and calibrations: Lagrangian and totally real geometry", *available on www.arxiv.org*
- 2) Corti-Haskins-Nordstrom-Pacini, "G<sub>2</sub> manifolds and associative submanifolds via semi-Fano 3-folds", *submitted*.
- 3) Corti-Haskins-Nordstrom-Pacini, "Asymptotically cylindrical Calabi-Yau 3-folds from weak Fano 3-folds", *Geometry and Topology* 17 (2013), 1955–2059.
- 4) Pacini, "Special Lagrangian conifolds, I: moduli spaces", *Proc. LMS* (3) 107 (2013), 198–224.
- 5) Pacini, "Special Lagrangian conifolds, II: gluing constructions", *Proc. LMS* (3) 107 (2013), 225–266.
- 6) Pacini, "Desingularizing isolated conical singularities: uniform estimates via weighted Sobolev spaces", *Comm. An. and Geom.* Volume 21 (2013), Number 1, 105--170.
- 7) Gangbo-Kim-Pacini, "Differential forms on Wasserstein space and infinite-dimensional Hamiltonian systems", *Memoirs AMS* 211 (2011), no. 993.
- 8) Haskins-Pacini, "Obstructions to special Lagrangian desingularizations and the Lagrangian prescribed boundary problem", *Geometry and Topology* 10 (2006), 1453—1521.
- 9) Pacini, "Deformations of asymptotically conical special Lagrangian submanifolds", *Pacific J. Math.* 215 (2004), no. 1, 151—181.
- 10) Pacini, "Mean curvature flow, orbits, moment maps", *Trans. Amer. Math. Soc.* 355 (2003), no. 8, 3343—3357.
- 11) Pacini, "Complex structures on SO(M,g)", *Boll. Unione Mat. Ital. Sez. B Artic. Ric. Mat.* (8) 2 (1999), no. 3, 639—654.

## Conference talks:

- 2014, *First Joint International Meeting RSME-SCM-SEMA-SIMAI-UMI*, Bilbao.
- 2014, *Carnival Differential Geometry school*, Torino.
- 2014, *Secondo workshop su varietà reali e complesse*, Pisa.
- 2012, *Optimal Transportation and Differential Geometry*, BIRS.
- 2012, *Manifolds with Special Holonomy and their Calibrated Submanifolds and Connections*, BIRS.
- 2011, *Taiwan international conference on geometry: Special Lagrangians and related topics*, National Taiwan University.
- 2008, *Giornate di Geometria Algebrica ed Argomenti Correlati*, Trento.
- 2006, *Southeast Geometry Seminar*, Univ. of Alabama.

2005, *Southeast Geometry Seminar*, Atlanta.  
2005, *Recent advances in Calculus of Variations and PDEs*, Pisa.  
2003, *Geometry of Lagrangian submanifolds*, IPAM, Los Angeles.  
2002, *Proprieta' geometriche delle varieta' reali e complesse. Nuovi contributi italiani*,  
Palermo.  
2002, *Joint conference AMS-UMI*, Pisa.  
2001, *Network meeting of the European project on Complex Analysis and Analytic  
Geometry*, Paris.  
1997, *Nuovi contributi italiani alla Geometria Differenziale*, Bari.

### **Seminar talks:**

University of Pisa, University of Parma, Johns Hopkins University, Imperial College,  
Oxford University, Edinburgh University, U. Mass. Amherst, Georgia Inst. Tech.,  
University of Georgia in Athens, Cambridge University, University of Milano-Bicocca,  
University of Pavia.

### **Teaching:**

*Scuola Normale Superiore:*

- Corso interno II anno (undergraduate): Co-instructor, 2013-2014.
- Mathematical methods for Chemistry (undergrad/grad): 2012-2013.
- Seminario matematico/fisico (undergraduate): Exercise sessions, 2009-2010,  
2010-2011, 2011-2012, 2012-2013.

*National Taiwan University:*

- Introduction to special Lagrangian geometry (summer school), 2011.

*University of Oxford:*

- B4 Analysis II (undergraduate): Class tutor, Hilary Term 2008.

*Georgia Institute of Technology:*

- Differential Geometry (undergrad/grad), Fall 2003.
- Ordinary Differential Equations (undergrad), Spring 2004.
- Calculus 3 (undergrad), Fall 2004.
- Math. methods for Engineers (undergrad/grad), Spring 2005.
- PDE I (undergrad/grad), Fall 2005.
- Calculus 3 (undergrad), Spring 2006.

*Imperial College:*

- Calibrations and special Lagrangian submanifolds (graduate), 2002.

### **Service:**

*Referee for:*

- Advances in Mathematics;
- Annals of Global Analysis and Geometry;
- Calculus of Variations and PDEs;
- Communications in Analysis and Geometry;
- Geometry and Topology;

- J. Functional Analysis;
- J. Geometry and Physics;
- Mathematische Annalen;
- Proc. London Math. Society;
- Rendiconti del Circolo Matematico di Palermo;
- Rendiconti del Seminario Matematico della Universita' di Padova;
- Rendiconti del Seminario Matematico dell'Universita' e del Politecnico di Torino;
- SIAM Journal of Mathematical Analysis;
- Trans. Am. Math. Soc.

*Reviewer* for Mathematical Reviews (AMS).

2013: *Referee* for PhD thesis, SISSA.

2011: *Peer reviewer* for a grant proposal submitted to EPSRC (UK gov. agency for scientific and technological research).

2010-onwards, *Committee member* for Master's and doctorate theses defenses and for admission exams, SNS.

2004, *Teaching mentor* for graduate students, GT.

2003-2004, *Coordinator* of the Geometry/Topology seminar, GT.