CURRICULUM VITAE

CONTACT INFORMATION

- **Name:** Giuseppe Maria Capriani
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PERSONAL INFORMATION

- **Date of Birth:** 10th February, 1986
- **Place of Birth:** Rome, Italy
- **Citizenship:** Italian
- **Sex:** Male

EDUCATION & POSITIONS

- Sep 2012 – now Research Associate,
  Applied Mathematics Münster,
  University of Münster, Germany.
  Research Group Prof. Angela Stevens.

- Mar 2010 – May 2013 PhD studies in Mathematical Analysis,
  Università degli Studi di Napoli "Federico II" (University of Naples), Italy.
  Thesis Title: *Geometric and functional inequalities in the Calculus of Variations*
  http://cvgmt.sns.it/paper/2122/
  Advisor: Prof. Nicola Fusco.

- Oct 2007 – Jul 2009 M.Sc., Mathematics, Università degli Studi di Palermo (University of Palermo), Italy. 110 (out of 110) cum laude.

- Oct 2004 – Jul 2007 B.Sc., Mathematics, Università degli Studi di Palermo (University of Palermo), Italy. 110 (out of 110) cum laude.

- Sep 1999 – Jul 2004 Scientific High School Degree, Istituto Montessori, Rome, Italy. 100 (out of 100).

MAIN MATHEMATICAL INTERESTS

- Mathematical Biology and modeling.
- Calculus of Variations and Applications.
- Symmetrization techniques.
- Geometric Measure Theory and Isoperimetric Inequalities.

RESEARCH ACTIVITIES

A first research field concerns the study of geometrical-functional inequalities for symmetrization techniques. In particular, I've analysed the Steiner rearrangement in

any codimension of Sobolev and BV functions, showing a Pòlya-Szegő type inequality for a large class of convex integrals. Finally, I exhibit minimal assumptions under which functions attaining equality are necessarily Steiner symmetric.

In collaboration with M. Barchiesi, N. Fusco and G. Pisante, we analysed the stability of the Pòlya-Szegő inequality in a quantitative way for the Steiner and the Schwarz rearrangement in a restricted subclass of functions, containing the concave fuctions.

A second research field concerns the study of variational models in linear elasticity. In particular, in collaboration with V. Julin and G. Pisante, we analysed a functional which models an elastic body with a cavity. We show that if a critical point has positive second variation then it is a strict local minimizer. We also provide a quantitative estimate.

A third research field concerns the study of a mathematical model describing biological membranes. In particular I'm currently studying phase separation for lipid membranes.

LIST OF PUBLICATIONS

1. G. M. Capriani, V. Julin & G. Pisante, *A quantitative second order minimality criterion for cavities in elastic bodies, SIAM J. Math. Anal.* 45, 2013, no. 3, 1952–1991.
   http://dx.doi.org/10.1137/120872152

2. G. M. Capriani, *The Steiner rearrangement in any codimension*, *Calc. Var. Partial Differential Equations*, **49** (2014), no. 1-2, 517-548.
   http://dx.doi.org/10.1007/s00526-012-0591-3

3. M. Barchiesi, G.M. Capriani, N. Fusco & G. Pisante, *Stability of Pòlya-Szegő inequality for log-concave functions*, (submitted paper,) 2013

OTHER MATHEMATICAL ACTIVITIES

- 10-14 Feb 2014, attended Winter School on "Calculus of Variations in Physics and Materials Science", University of Würzburg, Germany.

- 9-13 Sep 2013, attended ERC School on Geometric Functional Inequalities and Shape Optimization, Naples, Italy.

- 9-12 Jun 2013, attended SIAM Conference on "Mathematical Aspects of Materials Science", Philadelphia, USA.

- 30 May – 7 Jun 2013, attended 2013 CNA Summer School "Topics in Nonlinear PDEs and Calculus of Variations and Applications in Materials Science", Pittsburgh, USA.

- 3-23 Jun, 8-21 Jul 2012, attended Intensive Research Period "Geometric and Analytic Techniques in Calculus of Variations and Partial Differential Equations", CRM-SNS, Pisa, Italy.

- 6 Mar – 15 May 2012 Research Activities at Math Department, Seconda Università di Napoli, Caserta, Italy (with G. Pisante).

- 5-10 Feb 2012, attended XXII Convegno Nazionale di Calcolo delle Variazioni, Levico-Terme (Trento), Italy.

- 12 Oct 2011 – 24 Dec 2012 Research Activities at Math Department, Seconda Università di Napoli, Italy (with G. Pisante).

- 21 Aug – 3 Sep 2011, attended SMI Summer School "Hyperbolic systems of conservation laws", Cortona, Italy.

- 8-12 Aug 2011, attended 21st Jyvaskyla Summer School, Jyvaskyla, Finland.
- 11-22 Jul 2011, attended MSRI-Summer Graduate Workshop "Geometric Measure Theory and Applications", MSRI, Berkeley, California.
- 13-17 Jun 2011, attended Mini-courses in Mathematical Analysis, University of Padova, Italy.
- 5-10 Jun 2011, attended ERC-Summer School on Calculus of Variations, Continuum Mechanics and Geometric Inequalities, Ischia (Naples), Italy.
- 6-11 Feb 2011, attended XXI Convegno Nazionale di Calcolo delle Variazioni, Levico-Terme (Trento), Italy.
- 10-14 Jan 2011, attended ERC School on Analysis in Metric Spaces and Geometric Measure Theory, CRM, Pisa, Italy.
- 9-11 Sep 2010, attended Second Workshop on Thin Structures, Naples, Italy.
- 1-14 Aug 2010, attended SMI Summer School "Partial Differential Equations", Cortona, Italy.
- 19-31 Jul 2010, attended IHES Summer School "Singularities in Partial Differential Equations", IHES, Paris, France.
- 21-25 Jun 2010, attended Mini-courses in Mathematical Analysis, University of Padova, Italy.
- 13-18 Jun 2010, attended Gnampa-ERC Summer School, Ischia (Naples), Italy.
- 14-22 Sep 2009, attended "Topological *-algebras (in particular Banach *-algebras and C*-algebras)", Prof. Maria Fragoulopoulou, Ph.D. Lectures, University of Palermo, Italy.
- 1-5 Jun 2009 attended 5th Summer School in Analysis and Applied Mathematics, University La Sapienza, Rome, Italy.
- 27 Jul – 29 Aug 2008 attended SMI Summer Course in Mathematics, Perugia, Italy. Attended courses: Functional Analysis and Differential Geometry.

TEACHING ACTIVITIES

- 2012-13: Teacher Assistant, PDE 1. Faculty of Mathematics, University of Münster, Germany.
- 2011-12: Teacher Assistant, Calculus 1. Faculty of Engineering, University of Naples, Italy.
- 2011-12 Teacher Assistant, Calculus 2. Faculty of Science, Seconda Università di Napoli, Italy.
- 2010-11: Teacher Assistant, Calculus 1. Faculty of Engineering, University of Naples, Italy.

OTHER ACTIVITIES AND SKILLS

- Extensive knowledge of Windows, Linux, Mac OS X, Microsoft Office, OpenOffice.Org (LibreOffice), LaTeX.
- Basic knowledge of C, Java, HTML, Matlab, Bash scripting.

- Oct 2008 – Sep 2009 Civil Service (Servizio Civile). In my project, I've tutored engineering and science undergraduates. Project name: "Progetto Virgilio" - Collegio Universitario ARCES, Palermo – Italy.

- Languages: Italian (native), English (fluent), German (intermediate).

- Interests: IT, voluntary service, Philosophy, jogging.