

## PERSONAL DATA

Name: **Giandomenico ORLANDI** Place and date of birth: Rome, 05/01/1969  
Citizenship: Italian, French  
Known languages: italian, french, spanish, german, portuguese, english, spoken and written

## PRESENT POSITION

Full professor of Mathematical Analysis, Department of Computer Science, Univ. of Verona, from 1/1/2012.

## EDUCATION

Degree in Mathematics, University of Trento, 18/7/1991  
PhD in Mathematics, University of Trento, 24/1/1997

## PAST POSITIONS

**1/1/2005–31/12/2011** Associate Professor of Mathematical Analysis Univ. of Verona.  
**1/4/1997–31/12/2004** Research fellow of Mathematical Analysis, Univ. of Verona  
**1/6/1996–30/3/1997** National Civil Service  
**1/11/1995–31/5/1996** I.N.d.A. M. post-doc fellowship, University of Trento  
**1/11/1991–31/10/1995** PhD student, University of Trento  
**1/5/1991–31/10/1991** C.N.R. pre-doc fellowship, University of Trento

## VISITING POSITIONS

**Center:** Department of Mathematics, University of Toronto  
**Duration:** 19/6/2018–24/07/2018  
**Position:** Visiting Professor

**Center:** Centre de Mathématiques Appliquées, Ecole Polytechnique  
**Duration:** 23/6/2012–31/8/2012  
**Position:** Professeur Invité

**Center:** Laboratoire d'Analyse et de Mathématiques Appliquées, Université Paris Est  
**Duration:** 9/2/2011–9/5/2011  
**Position:** Professeur Invité

**Center:** Laboratoire J.L. Lions, Université Paris VI  
**Duration:** 20/3/2008–19/4/2008  
**Position:** Professeur Invité

**Center:** Department of Mathematics, University of Toronto  
**Duration:** 19/4/2007 – 4/5/2007  
**Position:** Visiting Professor

**Center:** Laboratoire J. Dieudonné, Université de Nice  
**Duration:** 12/2/2006 – 13/3/2006

**Position:** Professeur Invité

**Center:** Laboratoire J.L.Lions, Université Paris VI, France.

**Duration:** 1/3/2003 – 30/4/2003 e 20/11/2003 – 19/12/2003

**Position:** Visiting Post-Doc, prog. UE-RTN “*Fronts-Singularities*” (HPRN-CT-2002-00274)

**Center:** Laboratoire d’Analyse Numérique, Université Paris VI, France.

**Duration:** 15/11/2000 – 15/12/2000

**Position:** Visiting Post-Doc, prog. comune C.N.R./C.N.R.S. n. 132.03.2

**Center:** Laboratoire d’Analyse Numérique, Université Paris VI, France.

**Duration:** 1/3/2000 – 31/8/2000

**Position:** Post-Doc C.N.R., grant n. 203.01.71

**Center:** C.M.L.A., Ecole Normale Supérieure de Cachan, France

**Duration:** 1/3/1999 – 31/8/1999

**Position:** Post-Doc C.N.R. , grant n. 203.01.69

## PARTICIPATION / DIRECTION OF RESEARCH PROJECTS

**Title:** *CuMin, Currents and Minimizing Networks*, EU-H2020-MSCA-IF-2016, duration : 09/2017-09/2019. Researcher: Annalisa Massaccesi

**Role:** Project supervisor

**Title:** *Geometric evolutions of curves, surfaces and networks*, GNAMPA-INDAM 2017, duration: 03/2017-03/2018

**Role:** National coordinator

**Title:** *Studio matematico e modellazione della cicatrizzazione di tessuti epiteliali*, prog. Galileo 2014-15, Università Italo - Francese, duration: 09/2014–09/2015

**Coordinators:** L. Almeida (CNRS- UPMC - Paris), P. Bagnerini (Genova)

**Role:** Ricercatore dell’unità italiana

**Title:** *Calcolo delle Variazioni*, prog. PRIN - MIUR, duration: 2013-2016

**Coordinator:** Gianni Dal Maso (SISSA - Trieste)

**Role:** member of the Trento unit

**Title:** *Disuguaglianze e problemi variazionali in strutture metriche riemanniane e subriemanniane* , prog. PRIN - MIUR, duration: 2010-2012

**Coordinator:** Luigi Ambrosio (Scuola Normale Superiore, Pisa)

**Role:** member of the Trento unit

**Title:** *Some mathematical models in image processing and interfaces motion*, prog. Azione integrata Italia-Spagna - MIUR, duration: 2009-2011

**Role:** National coordinator

**Title:** *Metodi variazionali nella teoria del trasporto ottimo di massa e nella teoria geometrica della misura* , prog. PRIN - MIUR, duration: 2009-2010

**Coordinator:** Luigi Ambrosio (Scuola Normale Superiore, Pisa)

**Role:** member of the Trento unit

**Title:** *Superfici minime lorentziane* prog. GNAMPA-INDAM 2010

**Coordinator:** Matteo Novaga (Università di Padova)  
**Role:** coordinator of the Verona unit  
**Title:** *Energie di interfaccia e problemi parabolici-iperbolici in ambiente discreto e continuo*, prog. GNAMPA-INDAM 2008  
**Role:** Principal coordinator of the project  
**Title:** *Dinamica di fronti e singolarità*, prog. GNAMPA-INDAM 2007  
**Coordinator:** Giovanni Alberti (Università di Pisa)  
**Role:** coordinator of the Verona unit  
**Title:** *Metodi variazionali nella teoria del trasporto ottimo di massa e nella teoria geometrica della misura*, prog. PRIN - MIUR, duration: 2007-2008  
**Coordinator:** Luigi Ambrosio (Scuola Normale Superiore, Pisa)  
**Role:** member of the Trento unit  
**Title:** *Alcuni problemi di evoluzione non lineari suggeriti dalla Fisica e dalla Biologia*, prog. GNAMPA-INDAM 2006  
**Coordinator:** Matteo Novaga (Università di Pisa)  
**Role:** coordinator of the Verona unit  
**Title:** *Fronts-Singularities: Nonlinear partial differential equations describing front propagation and other singular phenomena*, RTN project (HPRN-CT-2002-00274), duration: 2002-2006  
**Coordinator:** Michiel Bertsch (IAC - CNR, Rome)  
**Role:** member of the italian team  
**Title:** *Calcolo delle Variazioni*, prog. PRIN - MIUR, durata complessiva: 2000–2006  
**Coordinator:** Luigi Ambrosio (Scuola Normale Superiore, Pisa)  
**Role:** member of the Trento unit  
**Titolo:** *Problemi variazionali geometrici in strutture deboli e applicazioni*, prog. nazionale C.N.R. (99.01699.CT01), durata: 2000–2001  
**Coordinatore:** Giovanni Alberti (Università di Pisa)  
**Ruolo:** Ricercatore dell'unità di Trento  
**Title:** *Struttura singolare e proprietà geometriche di punti critici di funzionali che si incontrano in Fisica ed in Geometria*, prog. comune C.N.R. / C.N.R.S. (132.03.2), durata: 2000–2001  
**Coordinator:** Luís Almeida (C.N.R.S. - Université de Nice (F) )  
**Role:** member of the Trento unit

#### OTHER FUNDED PROJECTS

**Project:** Bando incentivazione offerta formativa in lingua straniera - 2015 - CdLM Mathematics  
**Institution:** Università di Verona  
Duration: 2015-2018  
Role: principal coordinator  
**Project:** Bando incentivazione offerta formativa in lingua straniera - 2014 - CdLM Mathematics

**Institution:** Università di Verona

Duration: 2014-2016

Role: principal coordinator

**Project:** Bando incentivazione offerta formativa in lingua straniera - 2013 - CdLM Mathematics

**Institution:** Università di Verona

Duration: 2013-2015

Role: principal coordinator

**Project:** Cooperint 2011

**Institution:** Università di Verona

**Object:** invited professor at Ecole Polytechnique

**Duration:** 2 months (july-august 2012)

**Project:** Cooperint 2007

**institution:** Università di Verona

**Invited Professor:** R. Jerrard (Toronto)

**Duration:** 1 month (july 2008)

**Project:** Visiting Professor 2005

**Institution:** GNAMPA-INDAM

**Invited professor:** C. Muratov (NJIT, Newark)

**Duration:** 1 month (july 2005)

## RESEARCH ORGANIZATION AND SUPERVISION

### Organization of events

**Minisymposium:** “*Vriational and evolution problems for curves and networks*”, DEA 2019 AGH, Krakow, 16-20/09/2019, <https://www.dea.agh.edu.pl/d2-schedule>

**Workshop:** “*From to intercting particle systems to kinetic equations*”, University of Verona, 26-30/11/2018 (with G. Albi, M. Caliari, A. Marigonda)

**Workshop:** “*Geometric Measure Theory in Verona*”, University of Verona, 11-15/06/2018 (with A. Massaccesi, G. De Philippis, D. Vittone), <https://gmtarena.wordpress.com>

**Workshop:** “*Curves and networks in Geometric Analysis*”, Centro di Ricerca Matematica E. De Giorgi, Pisa, 26-30/6/2017 (with C. Mantegazza, M. Novaga) <http://www.crm.sns.it>

**Minisymposium:** “*Geometric variational and evolution problems*”, First Joint Meeting Brazil - Italy in Mathematics, Rio de Janeiro, 29/8-2/9/2016 (with S. Nardulli) <http://www.sbm.org.br/jointmeeting-italy/special-sessions>

**Workshop:** “*Autumn School in mathematical imaging and statistical learning*”, Dipartimento di Informatica, Verona, 6/10–24/10/2014 (with S. Parisotto) <http://profs.scienze.univr.it/sip14>

**Workshop:** “*Autumn School in variational methods for image processing*”, Dipartimento di Informatica, Verona, 21/10–31/10/2013 (with U. Castellani)

<http://profs.scienze.univr.it/sip14/sip13>

**Workshop:** “*Geometric evolutions and minimal surfaces in Lorentzian manifolds*”, Centro di Ricerca Matematica E. De Giorgi, Pisa, 6/9–10/9/2010 (with G. Bellettini, C. Mantegazza, M. Novaga) <http://www.crm.sns.it>

**Workshop:** “*Singularities in nonlinear evolution phenomena and applications*”, Satellite Conference of the 5th European Congress of Mathematics, Centro di Ricerca Matematica E. De Giorgi, Pisa, 26/5–30/5/2008 (with S. Baldo and M. Novaga) <http://www.crm.sns.it>

**Workshop:** “*Mathematical Problems in Modeling Generation and Dynamics of Vortices*”, Verona, 12-13/3/2004 (with L. Morato, P. Siri) <http://profs.sci.univr.it/siri/vortices.html>

**Workshop:** “*Topics in image analysis*”, Verona, 17/3/1998 (with B. Forte)

### Scientific supervision of post-doc fellows:

**Title:** *Proprietà geometriche e globali di EDP e problemi variazionali suggeriti dalla Fisica*

**Center:** Dipartimento di Informatica, Univ. Verona

**Duration:** 1/4/08–31/3/09

**Fellow:** S. Weitkamp

### INVITED TALKS

“Energy minimizing maps into Finsler manifolds and optimal 1D networks”, DEA 2019, AGH Krakow, 17/09/2019

“Topological singular et of vector-valued maps and applications”, Conference ”Variational Problems in Physics”, Toulouse, 22 May 2019

“Singularities for vector-valued Sobolev maps”, workshop ”Geometric Measure Theory and Applications”, Canazei 25-29/6/2019

“Convex relaxation and variational approximation of functionals defined on 1- dimensional connected sets”, Workshop ”Phase transitions”, Banff International Research Station, Banff, 30/04-05/05/2017

“On the convex relaxation and variational approximation of functionals defined on 1-dimensional connected sets, Workshop ”Transport Problems in Zürich, Universität Zürich, 24-26/4/2017

“Weighted TV minimization and application to vortex density models”, First Joint Meeting Brazil - Italy in Mathematics, Rio de Janeiro, 2/9/2016

“Convex relaxation and variational approximation for the Euclidean Steiner Tree problem”, Workshop ”Vortices and related topics in fluid and quantum mechanics”, ANR SchEq, Alghero 18/07/16

“Timelike minimal surfaces: weak parametrizations, varifolds and approximation schemes”, ■ Seminario di Analisi, Dip. Matematica e Applicazioni, Napoli 14/12/15

“Timelike minimal surfaces in Minkowski space and varifolds”, Workshop “Varifold Day”, Modena 11/03/15

“Vorticity models in Condensed Matter Physics and gradient flows of 1-homogeneous functionals” SIAM Conference - Nonlinear Waves NW14 - Cambridge 13/08/14

“Modèles asymptotiques en Physique de la matière condensée et flots gradients de fonctionnelles 1-homogènes”, séminaire Institut Camille Jordan et Ecole Normale Supérieure de Lyon, Lyon, 1/4/14.

“Time-like minimal surfaces in Minkowski space”, Conference “The 38th Sapporo Symposium on Partial Differential Equations”, Sapporo 23/08/13

“On time-like extremal surfaces in Minkowski spacetime”, School and Workshop “Geometric Measure Theory and Optimal Transport”, ICTP Trieste, 30/07/13.

“Timelike minimal surfaces in Minkowski spacetime”, workshop “Solitons, Vortices, Minimal surfaces and their Dynamics”, Institut Mittag-Leffler, Djursholm, 17/07/13

“Limiting models in condensed matter Physics and gradient flows of one-homogeneous functionals”, workshop “Geometric PDE”, Centro di Ricerca Matematica E. De Giorgi, Pisa 14/9/12.

“Varifold solutions to the relativistic strings equation”, workshop “PDE’s in real and complex spaces”, Padova 16/2/12.

“Slow motion for gradient systems with equal depth multiple-well potential”, minisymposium “Concentration phenomena in variational problems of mathematical physics”, ICIAM 2011, Vancouver 20/7/11.

“Surfaces minimales de type temps et limites singulières d’EDP hyperboliques”, Séminaire *Problèmes Spectraux en Physique Mathématique*, Institut Henri Poincaré, Paris 7/3/11.

“Asymptotic analysis of Ginzburg-Landau models”, Seminario del Dip. Informatica Univ. Verona, 23/11/10.

“Vortex density models for 3-D superconductivity”, Congresso SIMAI 2010, Cagliari, 25/6/2010.

“ $\Gamma$ -convergence for Ginzburg-Landau models in 3-d superconductivity”, *SIAM conference PD09*, Miami 9/12/09.

“Gamma-convergenza dei funzionali di Ginzburg-Landau in 3d per superconduttori con campo magnetico critico”, Seminario del Dip. Mat. Univ. di Padova, 26/3/09.

“Dynamics of multiple degree Ginzburg-Landau vortices”, Analysis Seminar, Courant Institute for Mathematical Sciences, New York 8/5/08.

“ $\Gamma$ -convergence des fonctionnelles de Ginzburg-Landau pour la supraconductivité en 3-d”, Séminaire du Laboratoire J.L.Lions, Paris 18/4/08.

“Aspects of vortex dynamics in Ginzburg-Landau models”, minisymposium “Recent trends in nonlinear parabolic PDE and their singular limits”, ICIAM 07, Zürich, 20/7/2007.

“Alcuni aspetti della dinamica dei vortici nei modelli 2d di Ginzburg-Landau”, seminario del Dip. Me.Mo.Mat., Univ. Roma 1, 18/4/2007.

“Dinámica de vortices de Ginzburg-Landau”, seminario del Depart. de Matemática Aplicada, Univ. Politécnica, Valencia, 14/3/2007.

“Asymptotics for the Ginzburg-Landau functional of superconductivity in high dimensions”, workshop *Limiting problems in Analysis*, Lorentz Center, Leiden (NL), 4/5/2006.

“Dynamique de vortex de degré multiple dans les modèles de Ginzburg-Landau”, seminario del Lab. Jean Dieudonné, Univ. Nice (F), 10/3/2006.

“Dinamica di vortici di grado multiplo nella teoria di Ginzburg-landau”, workshop “*Calcolo delle Variazioni: Teoria Geom. della Misura e  $\Gamma$ -convergenza*”, Levico, 9/2/2006.

“Movimiento de conjuntos de concentración en dinámica disipativa de Ginzburg-Landau”, seminario del Depart. de Matemática Aplicada, Univ. Complutense, Madrid, 29/3/2005.

“Dinamica dissipativa dei vortici in modelli 2D di Ginzburg-Landau”, workshop “*Calcolo delle Variazioni: Teoria Geom. della Misura e  $\Gamma$ -convergenza*”, Levico, 31/1/2005.

“Motion of concentration sets in Ginzburg-Landau equations”, congresso *SIAM Conference on Analysis of Partial Differential Equations*, Houston (TX), 7/12/2004.

“Collisions and phase-vortex interaction in dissipative Ginzburg-Landau dynamics”, congresso *Nonlinear partial differential equations describing front propagation and other singular phenomena*, Lorentz Center, Leiden (NL), 10/11/2004.

“Convergenza dell’equazione di Ginzburg-Landau parabolica al moto per curvatura media”, seminario del Dipartimento di Matematica, Univ. Roma 2, 3/6/2003.

“Anneaux de vorticit  dans Schr dinger non lin aire”, seminario presso il Laboratoire J.L. Lions, Univ. Paris VI, 12/3/2003.

“Jacobians and Ginzburg-Landau functionals”, congresso *Calculus of Variations in nonlinear phenomena*, Martina Franca (Italia), 26/9/2002.

“Ellipticity and compactness in the Ginzburg-Landau equation”, congresso *Variational problems with singularities*, Newton Institute, Cambridge 28/6/2001.

“Bords d’ensembles rectifiables et Jacobiens d’applications   valeur dans des spheres”, seminario presso il Laboratoire d’Analyse Num rique, Univ. Paris VI, 23/5/2001.

“Applications ayant Jacobien prescrit et convergence variationnelle des energies de Ginzburg - Landau”, seminario presso il C.M.L.A., E. N. S. Cachan (F), 22/6/2000.

“Maps with prescribed Jacobians and variational convergence for Ginzburg - Landau energies”, congresso *Topological defects and Ginzburg-Landau functionals*, Lorentz Center, Leiden (NL), 4/4/2000.

“Probl mes variationnels   croissance lin aire en classes de cohomologie et theorie de Hodge non-lin aire”, seminario del C.M.L.A., E. N. S. Cachan (F), 14/5/99.

“On the approximation of homological cycles”. congresso *Analysis of the geometry of surfaces, maps and free boundaries*, Albert-Ludwigs Universit t Freiburg (D), 13/7/98.

“Comportamento asintotico del funzionale di Ginzburg-Landau su fibrati lineari complessi”, workshop “*Calcolo delle Variazioni: Teoria Geometrica della Misura, rilassamento e  $\Gamma$ -convergenza*”, Trento (I) 23/2/95.

“Comportement asymptotique de la fonctionnelle de Ginzburg-Landau sur fibrés lineaires complexes”, seminario del Laboratoire d’Analyse Numerique, Univ. Paris VI, 16/2/95.

“Types de homotopie pour applications de Sobolev tendrement approchables entre variétés”, seminario del C.M.L.A., E. N. S. Cachan (F), 6/1/94.

#### PHD THESIS DEFENSE JURY MEMBERSHIP

Place and date: Université Pierre et Marie Curie Paris VI, 3/7/07

Candidate: S. Kirsch

Title: *Courbure moyenne et interfaces*

Place and date: Università di Trento, 29/2/08

Candidate: S. Weitkamp

Title: *Some Problems with Singularities arising in Physics*

Place and date: Universitat Politècnica de Valencia, 28/4/08

Candidate: M.A. García March

Title: *Modelizaciòn y simulaciòn de dispositivos micromètricos basados en estructuras espaciales de solitones òpticos*

Place and date: Université Pierre et Marie Curie -Paris VI, 9/12/10

Candidate: N. Rougerie

Title: *La théorie de Gross-Pitaevskii pour un condensat de Bose-Einstein en rotation: vortex et transitions de phase*

Place and date: Université Pierre et Marie Curie -Paris VI, 12/12/11

Candidate: G. Nardi

Title: *On a characterization of the relaxation of a generalized Willmore functional*

Place and date: Scuola Normale Superiore - Pisa, 05/03/14

Candidate: A. Massaccesi

Title: *Currents with coefficients in groups, applications and other problems in Geometric Measure Theory*

Place and date: Institut Camille Jordan - Université Claude Bernard Lyon 1 - Lyon, 13/12/14

Candidate: B. Buet

Title: *Approximation de surfaces par des varifolds discrets: représentation, courbure, rectifiabilité*

Place and date: Université Pierre et Marie Curie - Paris VI, 23/1/15

candidate: D. Côte

Title: *Vortices and unbounded data for the parabolic Ginzburg - Landau equations*

Place and date: Sapienza Università di Roma - 19/2/19

candidate: F. Dipasquale

Title: *Variational methods in the Landau-De Gennes theory of liquid crystals*

Place and date: Università di Trento - 15/4/19



candidate: M. Bonafini

Title: *Variational approximations of optimal networks and hyperbolic obstacle problems*

## PUBLICATIONS

### Articles in journals

[40] Canevari, G; Orlandi, G. Topological singular set of vector-valued maps, I: applications to manifold-constrained Sobolev and BV spaces. *Calc. Var. Partial Differential Equations* 58 (2019), no. 2, Art. 72, 40 pp.

*Key words:* Sobolev maps into manifolds, topological defects, flat chains

[39] Bonafini, M.; Novaga, M.; Orlandi, G. A variational scheme for hyperbolic obstacle problems. *Nonlinear Anal.* 188 (2019), 389–404.

*Key words:* Hyperbolic equations, obstacle problem, convex approximation, minimizing movements

[38] M. Bonafini, G. Orlandi, E. Oudet, Convex relaxation and variational approximation of functionals defined on 1-dimensional connected sets. *Atti Accad. Naz. Lincei Rend. Lincei Mat. Appl.* 29 (2018), no. 4, 597–606.

*Key words:* convex relaxation, Steiner tree problem, Gilbert-Steiner problem, Modica-Mortola

[37] M. Bonafini, G. Orlandi, E. Oudet, Variational approximation of functionals defined on 1-dimensional connected sets: the planar case, *SIAM J. Math. Anal.* 50 (2018), no. 6, 6307–6332.

*Key words:* convex relaxation, Steiner tree problem, Gilbert-Steiner problem, Modica-Mortola

[36] P. Athavale, R. Jerrard, M. Novaga, G. Orlandi, Weighted TV minimization and applications to vortex density models, *J. Convex Analysis* 24 (2017), n. 4, p. 1051–1084

*Key words:* superfluidity, convex optimization, total variation, vorticity

[35] J. Calvo, M. Novaga, G. Orlandi, Parabolic equations in time dependent domains, *J. Evol. Equations* 17 (2017), n.2, p. 781–804 *Key words:* parabolic equations, monotone operators, non cylindrical domains

[34] G. Bellettini, M. Novaga, G. Orlandi, Eventual regularity for the parabolic minimal surface equation, *Discr. Cont. Dyn. Syst. A* 35 (2015), n. 12, 5711–5723 *Key words:* parabolic equations, minimal surfaces, regularity theory

[33] R.L. Jerrard, M. Novaga, G. Orlandi, On the regularity of timelike extremal surfaces, *Communications in Contemporary Mathematics* 17, 1450048 [19 p.] DOI: 10.1142/S0219199714500485 (2015)

*Key words:* lorentzian minimal surfaces, string theory, differential topology

[32] S. Baldo, R.L. Jerrard, G. Orlandi, H.M. Soner: *Vortex density models for Superconductivity and Superfluidity*, *Comm. Math. Physics* 318 (2013), 131–171. *Key words:*  $\Gamma$ -convergence, Gross-Pitaevskii, 3D Bose-Einstein condensation

[31] G. Bellettini, M. Novaga, G. Orlandi, Lorentzian varifolds and applications to relativistic strings, *Indiana University Mathematics Journal* 61, n. 6, 2251–2310 (2013) *Key words:* varifolds, lorentzian minimal surfaces, relativistic string theory

- [30] S. Baldo, R.L. Jerrard, G. Orlandi, H. M. Soner: *Convergence of Ginzburg-Landau functionals in 3-d superconductivity*, Arch. Rat. Mech. Analysis **205** (2012), 699–752. *Key words*:  $\Gamma$ -convergence, Ginzburg-Landau, 3D superconductivity
- [29] A. Daducci; A. Marigonda; G. Orlandi; R. Posenato: *Neuronal fiber-tracking via optimal mass transportation*, Comm. Pure Appl. Analysis **11** (2012), 2157–2177. *Key words*: Tractography, optimal transportation
- [28] A. Briani, A. Chambolle, M. Novaga, G. Orlandi: *On the gradient flow of a one-homogeneous functional*, Confluentes Math. **3** (2011), 617–635  
*Key words*: Convex duality, gradient flows, Hele-Shaw
- [27] F. Bethuel, G. Orlandi, D. Smets: *Slow motion for gradient systems with equal depth multiple-well potentials*, J. Differ. Equations **250** (2011), 53–94. *Key words*: Dynamics of fronts, slow motion, reaction-diffusion systems
- [26] G. Bellettini; J. Hoppe; M. Novaga; G. Orlandi, “*Closure and convexity results for closed relativistic strings*”, Complex Analysis and Operator Theory **4** (2010), 473–496. *Key words*: String theory, hyperbolic mean curvature flow
- [25] G. Bellettini; M. Novaga; G. Orlandi, “*Time-like minimal submanifolds as singular limits of nonlinear wave equations*”, Physica D Nonlinear Phenomena **239** (2010), 335–339. *Key words*: Non linear wave equations, Ginzburg-Landau, lorentzian minimal surfaces
- [24] S. Baldo, G. Orlandi, S. Weitkamp: “*Convergence of minimizers with local energy bounds for the Ginzburg-Landau functionals*”, Indiana University Mathematics Journal **58** (2009), 2369-2408. *Key words*:  $\Gamma$ -convergence, local minimizers, Ginzburg-Landau, Geom. Meas. Theory.
- [23] F. Bethuel, G. Orlandi, D. Smets: “*Dynamics of multiple degree Ginzburg-Landau vortices*”, Comm. Math. Phys. **272** (2007), 229–261. *Key words*: Ginzburg-Landau, parabolic equations, vortex dynamics.
- [22] F. Bethuel, G. Orlandi, D. Smets: *Quantization and motion law for Ginzburg-Landau vortices*, Arch. Rational Mech. Anal. **183** (2007), 315–370. *Key words*: Ginzburg-Landau, parabolic equations, vortex dynamics
- [21] F. Bethuel, G. Orlandi, D. Smets: *Convergence of the parabolic Ginzburg-Landau equation to motion by mean curvature*, Annals of Mathematics, **163** (2006), 37–163. *Key words*: Ginzburg-Landau, parabolic equations, mean curvature flow.
- [20] F. Bethuel, G. Orlandi, D. Smets: *Collisions and phase-vortex interaction in dissipative Ginzburg-Landau dynamics*, Duke Math. J., **130** (2005), 523–614. *Key words*: Ginzburg-Landau, parabolic equations, vortex dynamics
- [19] G. Alberti, S. Baldo, G. Orlandi: *Variational convergence for functionals of Ginzburg-Landau type*, Indiana Univ. Math. J., **54** (2005), 1411–1472. *Key words*:  $\Gamma$ -convergence, Ginzburg-Landau, Geom. Metric Theory, minimal surfaces.
- [18] L. Almeida, Y. Ge, G. Orlandi: *Some connections between symmetry results for semi-linear PDE in real and hyperbolic spaces*, J. Math. Anal. Appl. **311** (2005), 626–634. *Key words*: symmetry, moving planes, positive solutions of PDE.
- [17] F. Bethuel, G. Orlandi, D. Smets: *Improved estimates for the Ginzburg-Landau equation: the elliptic case*, Ann. Sc. Norm. Sup. (5) **4** (2005), 319–355. *Key words*: Ginzburg-Landau, elliptic equations, potential theory

- [16] F. Bethuel, G. Orlandi, D. Smets: *Approximations with vorticity bounds for the Ginzburg-Landau functional*, Comm. Contemp. Math. **6** (2004), 803–832. *Key words*: Jacobians, Ginzburg-Landau functional
- [15] F. Bethuel, G. Orlandi, D. Smets: *On an open problem for Jacobians raised by Bourgain, Brezis and Mironescu*, C.R. Acad. Sci. Paris, Série 1 **337** (2003), 381–385. *Key words*: Jacobians, Ginzburg-Landau functional
- [14] F. Bethuel, G. Orlandi, D. Smets: *Motion of concentration sets in Ginzburg-Landau equations*, Ann. Sci. Fac. Toulouse **XIII** (2004), 3–43.  
*Key words*: Ginzburg-Landau, parabolic equations, phase transitions, mean curvature flow.
- [13] F. Bethuel, G. Orlandi, D. Smets: *Vortex rings for the Gross-Pitaevskii equation*, J. Eur. Math. Soc. **6** (2004), 17–94. *Key words*: non-linear Schrödinger equation, travelling waves, binormal curvature flow.
- [12] G. Alberti, S. Baldo, G. Orlandi: *Functions with prescribed singularities*, J. Eur. Math. Soc. **5** (2003), 275–311.  
*Key words*: Geometric measure theory, Integral flat chains, Jacobians, Sobolev maps
- [11] F. Bethuel, G. Orlandi: *Uniform estimates for the parabolic Ginzburg-Landau equation*, ESAIM Contr. Optim. Calc. Var. **8** (2002), 219–238.  
*Key words*: Ginzburg-Landau, parabolic equations, Jacobians, Hodge theory.
- [10] F. Bethuel, J. Bourgain, H. Brezis, G. Orlandi:  *$W^{1,p}$  estimates for solutions to the Ginzburg-Landau equation with boundary data in  $H^{1/2}$* , C. R. Acad. Sc. Paris, Série 1 **333** (2001), 1069–1076. *Key words*: Ginzburg-Landau, elliptic equations, Jacobians, Hodge theory.
- [9] F. Bethuel, H. Brezis, G. Orlandi: *Asymptotics for the Ginzburg-Landau equation in arbitrary dimensions*, J. Funct. Anal. **186** (2001), 432–520. *Key words*: Ginzburg-Landau, elliptic equations, Geometric Measure Theory.
- [8] F. Bethuel, H. Brezis, G. Orlandi: *Small energy solutions to the Ginzburg-Landau equation*, C. R. Acad. Sc. Paris, Série 1 **331** (2000), 763–770. *Key words*: Ginzburg-Landau, elliptic equations, monotonicity formulas, Hodge theory.
- [7] S. Baldo, G. Orlandi: *Fiber bundles and regular approximation of codimension-one cycles*, Ann. Glob. Anal. Geom. **20** (2001), 47–57. *Key words*: Geometric measure theory, homology, fiber bundles.
- [6] S. Baldo, G. Orlandi: *Codimension one minimal cycles with coefficients in  $\mathbf{Z}$  or  $\mathbf{Z}_p$  and variational functionals on fibered spaces*, J. Geom. Anal. **9** (1999), 547–568.  
*Key words*:  $\Gamma$ -convergence, Minimal surfaces, homology, fiber bundles, phase transitions.
- [5] S. Baldo, G. Orlandi: *A note on the Hodge theory for functionals with linear growth*, Manuscr. Math. **97** (1998), 453–467.  
*Key words*: Hodge theory, differential forms, global analysis on manifolds.
- [4] S. Baldo, G. Orlandi: *Cycles of least mass in a riemannian manifold, described through the “phase transition” energy of the sections of a line bundle*, Math. Z. **225** (1997), 639–655.  
*Key words*:  $\Gamma$ -convergence, homology, minimal surfaces, fiber bundles, phase transitions.
- [3] G. Orlandi: *Asymptotic behavior of the Ginzburg-Landau functional on complex line bundles over compact Riemann surfaces*, Rev. Math. Phys. **8** (1996), 359–380.  
*Key words*: Ginzburg-Landau, elliptic equations, fiber bundles.

[2] S. Baldo, G. Orlandi: *Homotopy types for tamely approximable Sobolev maps between manifolds*, Calc. Var. PDE **4** (1996), 369–384.

*Key words:* Sobolev spaces, homotopy, geometric measure theory.

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*Key words:*  $\Gamma$ -convergence, asymptotic analysis, phase transitions, curvatures.

### Articles in Conference Proceedings

- [A14] G. Cavagnari, A. Marigonda, G. Orlandi, Hamilton-Jacobi-Bellman Equation for a Time-Optimal Control Problem in the Space of Probability Measures, IFIP ADVANCES IN INFORMATION AND COMMUNICATION TECHNOLOGY, **494**, 200–208. Proceedings of the 27th IFIP TC 7 Conference, CSMO 2015, Sophia Antipolis, France
- [A13] M. Novaga, G. Orlandi, Limiting models in condensed matter Physics and gradient flows of 1-homogeneous functionals, in *Geometric partial differential equations*, CRM series **15**, Pisa Edizioni della Scuola Normale Superiore, Proceedings of "Geometric Partial Differential equations", Centro "E. De Giorgi" - Scuola Normale Superiore - Pisa, september 2012, 211–226 (2013).
- [A12] G. Orlandi, Time-like minimal surfaces in Minkowski space, in *Hokkaido University technical report series 159*, Hokkaido University Press, Proceedings of "The 38th Sapporo Symposium on Partial Differential Equations", Sapporo, Japan, August 2013, 69–71 (2013).
- [A11] Marigonda A; Orlandi G: *Optimal mass transportation-based models for neuronal fibers*, in "Large-Scale Scientific Computing", Springer Verlag, Lecture Notes in Computer Science **7116** (2012), 131–138. Proceedings "Large-Scale Scientific Computing", Sozopol, Bulgaria, 6/6-10/6/2011. *Key words:* Tractography, Optimal mass transportation
- [A10] A. Marigonda; G. Orlandi: *A mathematical model for neuronal fibers*, Comm. Appl. Ind. Math. **2** (2011), Proceedings of "SIMAI 2010", Cagliari, 21/6-25/6/2010  
*Key words:* Tractography, Optimal mass transportation
- [A9] S. Baldo, R. L. Jerrard, G. Orlandi, H. M. Soner: *Asymptotics for Ginzburg-Landau energies in 3-D condensed matter physics*, Comm. Appl. Ind. Math. **2** (2011), Proceedings of "SIMAI 2010", Cagliari, 21/6-25/6/2010  
*Key words:*  $\Gamma$ -convergence, Ginzburg-Landau, Gross-Pitaevskii, vortices
- [A8] C. Muratov, M. Novaga, G. Orlandi, C. Garcia-Cervera: *Geometric strong segregation theory for compositionally asymmetric diblock copolymer melts*, in "Singularities in Nonlinear Evolution Phenomena and Applications:proceedings", Centro di Ricerca Matematica E. De Giorgi, Scuola Normale Superiore, Pisa (2009), 171–182.  
*Key words:* smart materials, elliptic equations, free boundaries
- [A7] S. Baldo; G. Orlandi; S. Weitkamp, "Asymptotic behavior of energy-bounded local minimizers of the Ginzburg-Landau functionals", in "Singularities in Nonlinear Evolution Phenomena and Applications:proceedings", Centro di Ricerca Matematica E. De Giorgi, Scuola Normale Superiore, Pisa (2009), 47–57.

- [A6] F. Bethuel, G. Orlandi, D. Smets: *Aspects of vortex dynamics in Ginzburg-Landau models*, Proceedings of ICIAM 07, Proceedings in Pure and Applied mathematics and Mechanics **7** (2007), 1040401–1040402.
- [A5] F. Bethuel, G. Orlandi, D. Smets: *On the Cauchy Problem for Phase and Vortices in the Parabolic Ginzburg-Landau Equation*, in “Singularities in PDE and the Calculus of Variations”, CRM Proceedings & Lecture Notes **44** (2008), 11–32.
- [A4] F. Bethuel, G. Orlandi, D. Smets: *Dynamique des tourbillons de vorticit  pour l’ equation de Ginzburg-Landau parabolique*, S minaire: Equations aux D riv es Partielles. 2006–2007, Exp. No. XVIII, 18 pp., Ecole Polytech., Palaiseau, 2007.
- [A3] F. Bethuel, G. Orlandi, D. Smets: *Vortex motion and phase-vortex interaction in dissipative Ginzburg-Landau dynamics*, S minaire: Equations aux D riv es Partielles”, Exp. No. X, 12 pp., Ecole Polytech., Palaiseau, (2004).
- [A2] F. Bethuel, G. Orlandi: *Ginzburg-Landau functionals, phase transitions and vorticity*, in “Noncompact problems at the intersection of Geometry, Analysis and Topology”, Rutgers University 2001. AMS, Contemporary Mathematics **350** (2004), 35–48.
- [A1] L. Almeida, F. Bethuel, G. Orlandi: *Interfaces et condensation de vorticit  dans les mod les de Ginzburg-Landau*, in “Colloque Soci t  Math matique Tunisienne”, (2002).

### **Edition of Proceedings**

- [C1] *Singularities in Nonlinear Evolution Phenomena and Applications: proceedings*. Atti del convegno ”Singularities in nonlinear evolution phenomena and applications”, CRM ”E. Degiorgi”, Scuola Normale Superiore, Pisa, 26/5-30/5/2008. Eds: M. Novaga; G. Orlandi , Edizioni della Normale, Pisa (2009).

### **Other publications**

- [P3] F. Bethuel, G. Orlandi, D. Smets: *Dynamics of multiple degree Ginzburg-Landau vortices*, C. R. Math. Acad. Sci. Paris **342** (2006), 837–842. *Key words:* Ginzburg-Landau, parabolic equations, vortex dynamics.
- [P2] F. Bethuel, G. Orlandi, D. Smets: *Convergence of the parabolic Ginzburg-Landau equation to motion by mean curvature*, C. R. Math. Acad. Sci. Paris **336** (2003), 719–723. *Key words:* Ginzburg-Landau, parabolic equations, mean curvature flow, Brakke-Ilmanen motion.
- [P1] G. Orlandi: *Alcuni problemi variazionali geometrici suggeriti dalla Fisica*, Ph. D. Thesis, University of Trento, UTM Ph.D. Lecture Notes Series **9** (1997).  
*Key words:*  $\Gamma$ –convergence, geometric measure theory, minimal surfaces, fiber bundles, phase transitions.

## REFeree ACTIVITY

**Journals:** Communications in Mathematical Physics. Archive for Rational Mechanics and Analysis. Journal of the European Mathematical Society. Annales I.H.P. Analyse Non Lin aire. Calculus of Variations and PDE. Nonlinear Analysis: Theory, Methods and Applications. Communications in Contemporary Mathematics. Discrete and Continuous Dynamical Systems. Journal of Differential and integral equations. Mathematische Zeitschrift. Mathematical Reviews.

## INSTITUTIONAL ACTIVITIES

member of the committee PA MAT/05 University of Padua (2015, 2018)

member of the committee PA MAT/05 University of Pisa (2016)

Deputy Director of the Department of Computer Science (2019-present).

Chairman of the Master's degree in Mathematics (2012-2018).

Member of the Educational Committee of ECMI - European Consortium for Mathematics in Industry (2015 - present)

Member of the board of the Trento-Verona Joint PhD program in Mathematics (2013/14–2017/18)

Erasmus+ partnerships local coordinator:

Sorbonne Université Paris

Universitat Autònoma de Barcelona,

INP Grenoble,

UGA Grenoble

Université de la Côte d'Azur, Nice.

University of Novi Sad, Serbia

Polytechnic University Wrocław, Poland

PhD Thesis supervision

PhD Thesis: "Variational approximations of optimal networks and hyperbolic obstacle problems"

Candidate: M. Bonafini (2019)

further positions: Post-Doc, TUM München

### **Master thesis supervision**

Master Thesis: "Calibration method for irrigation type problems"

co-supervisor: A. Massaccesi (Università di Padova)

candidate: Le Van Phu Cuong (2019)

Actual position: PhD student, Università di Trento

Master Thesis: "A two species model for contact inhibition and proliferation of particles"

co-supervisor: D. Peurichard (Sorbonne Université)

candidate: Valeria Caliaro (2019)

Actual position: PhD student, INRIA Paris

Master Thesis: "A two species model for contact inhibition and proliferation of particles"

co-supervisor: S. Fratini, A. Ralko (INP Grenoble)

candidate: Erik Pillon (2019)

Actual position: PhD student, University of Luxembourg

Master Thesis: "Numerical assessment of the role of boundary conditions in patient-specific simulations of aortic diseases"

co-supervisor: A. Veneziani (Emory University, USA)

candidate: Anna Ferrarini (2018)

Actual position: PhD student, Università di Pavia

Master Thesis: " Hierarchical sparsity with non negativity constraint in large scale optimisation"

co-supervisor: A. Daducci (EPFL Lausanne)

candidate: Matteo Frigo (2016)

Actual position: PhD student, INRIA Nice Sophia Antipolis

Master Thesis: " Quantitative and numerical study of phenotype-structured equations modelling evolutionary dynamics in cancer cell populations"

co-supervisor: T. Lorenzi (St Andrews University)

candidate: Giada Fiandaca (2016)

Actual position: PhD student, Università di Torino

Master Thesis: " Mathematical modelling of marine bacteriophages evolution"

co-supervisor: A. Korobeinikov (Universitat Autònoma de Barcelona)

candidate: Silvia Pagliarini (2016)

Actual position: PhD student, INRIA Bordeaux

Master Thesis: " Microscopic and macroscopic modelling of neural spike trains using age structured PDEs and point processes"

co-supervisor: P. Reynaud-Bouret (Université Nice Sophia Antipolis)

candidate: Valentina Mazzi (2016)

Actual position: PhD student, Università di Torino

Master Thesis: " DDFV methods and decomposition of domains: applications to fluid mechanics"

co-supervisor: T. Goudon, S. Krell (Université Nice Sophia Antipolis)

candidate: Giulia Lissoni (2016)

Actual position: PhD student, Université de Nice sophia Antipolis

Master Thesis: " Super resolution of Fetal brain MRI and dMRI"

co-supervisor: M. Bach Cuadra (Universitat Autònoma de Barcelona)

candidate: Alessandro Mella (2016)

Actual position: PhD student, Universit di Bologna

Master Thesis: "A BMO-type scheme for the relativistic hyperbolic mean curvature flow"

Candidate: M. Bonafini (2015)

further positions: post-doc, TUM Mnchen

Master Thesis: "Variational methods in Image Processing for Impainting and Shadow removal"

Co-supervisor: S. Masnou (Lyon 1)

Candidate: S. Parisotto (2014)

further positions: PhD student, Department of Applied Mathematics and Theoretical Physics, University of Cambridge Post-Doc, Cambridge

Master Thesis: “High order edge elements and domain decomposition for Maxwell’s equation”

Co-supervisor: F. Rapetti (Nice - Sophia Antipolis), V. Dolean (Glasgow)

Candidate: M. Bonazzoli (2014)

further positions: PhD student, Laboratoire Jean Dieudonné, Université de Nice - Sophia Antipolis, Chargée de recherche, INRIA, Université Paris Sud

Master Thesis: “Spectral methods for shape analysis”

Co-supervisor: U. Castellani (Verona)

Candidate: D. Boscaini (2013)

Actual position: PhD student, Università della Svizzera Italiana, Lugano, RTD-A Post-Doc researcher in computer Science, University of Trento

## TEACHING ACTIVITY

*Università di Trento:*

**a.a. 1995-96** Esercitazioni: Matematica Generale.

*Università di Verona:*

**a.a. 1997-98** Esercitazioni: Analisi Matematica 1

**a.a. 1998-99** Esercitazioni: Analisi Matematica 1.

**a.a. 1999-00** Corsi: Analisi Matematica 2. Esercitazioni: Analisi Matematica 1.

**a.a. 2000-01** Corsi: Analisi Matematica 1, Analisi Matematica 2.

**a.a. 2001-02** Corsi: Analisi Matematica 1, Analisi Matematica 2.

**a.a. 2002-03** Corsi: Analisi Matematica 1, Analisi Matematica 2.

**a.a. 2003-04** Corsi: Analisi Matematica 1, Metodi Matematici (corso di Dottorato)

**a.a. 2004-05** Corsi: Analisi Matematica 1, Analisi Matematica 2.

**a.a. 2005-06** Corsi: Analisi Matematica 2, Complementi di Analisi, Analisi Matematica 1 (modulo avanzato).

**a.a. 2006-07** Corsi: Analisi Matematica 1, Analisi Matematica 2 (moduli base e avanzato).

**a.a. 2007-08** Corsi: Complementi di Analisi, Analisi Matematica 1 (modulo base), Analisi Matematica 2 (modulo avanzato).

**a.a. 2008-09** Corsi: Complementi di Analisi, Analisi Matematica 1 (modulo base), Analisi Matematica 2 (modulo avanzato).

**a.a. 2009-10** Corsi: Analisi Matematica 2, Analisi Matematica 3, Analisi Funzionale

**a.a. 2010-11** Corsi: Analisi Matematica 2, Analisi Matematica 3, Analisi Funzionale

**a.a. 2011-12** Corsi: Analisi Matematica 2, Analisi Matematica 3, Analisi Funzionale

**a.a. 2012-13** Corsi: Analisi Matematica 2, Analisi Matematica 3, Functional Analysis

**a.a. 2013-14** Corsi: Analisi Matematica 2, Analisi Matematica 3, Functional Analysis, Mathematical Methods in life sciences (seminariale)

**a.a. 2014-15** Corsi: Analisi Matematica 2, Analisi Matematica 3, Functional Analysis, Mathematical Methods in the applied Sciences (seminariale)

**a.a. 2015-16** Corsi: Analisi Matematica 2, Analisi Matematica 3, Functional Analysis, Mathematical Methods in the applied Sciences (seminariale)



**a.a. 2016-17** Corsi: Analisi Matematica 2, Analisi Matematica 3, Functional Analysis, Mathematical Methods in the applied Sciences (seminariale)

**a.a. 2017-18** Corsi: Analisi Matematica 2, Analisi Matematica 3, Functional Analysis, Mathematical Methods in the applied Sciences (seminariale)

**a.a. 2018-19** Corsi: Analisi Matematica 2, Analisi Matematica 3, Functional Analysis, Mathematical Methods in the applied Sciences (seminariale)

*Scuola di Dottorato in Matematica, Università di Padova*

**a.a. 2010-11** Corso "Asymptotic analysis of Ginzburg-Landau models"