ALLEGATO B

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Curriculum Vitae et Studiorum

Personal information

Name: Eugenio
Surname: Vecchi
Date of Birth: November 10, 1987 in Bologna, Italy.

Current Position

Post-doc at the Department of Mathematics of Università degli Studi di Trento: 03/12/2018-30/11/2019.

Post-doc Positions

Post-doc at the Department of Mathematics "Guido Castelnuovo", Sapienza Università di Roma: 01/12/2017-30/11/2018.
Scientific supervisor: Prof. Adriano Pisante.

Marie Curie Experienced Researcher (Post-doc) within the ITN EU research project "MAnET" at the Department of Mathematics of Università degli studi di Bologna: 01/10/2015-30/09/2017.
Scientific supervisor: Prof. Bruno Franchi.

Academic Education

PhD in Mathematics: 29/10/2015 - University of Bern.
Title: Steiner formula and Gauss-Bonnet Theorem in the Heisenberg group.
Advisor: Prof. Dr. Zoltán Balogh.

Master degree in Mathematics: 15/07/2011 - Università degli studi di Bologna.
Title: Higher order wave equations in Carnot groups.
Advisor: Prof. Bruno Franchi.
Final mark: 110/110 magna cum laude.

Bachelor degree in Mathematics: 17/07/2009 - Università degli studi di Bologna.
Title: Stime di decadimento per trasformate di Fourier di densità.
Advisor: Prof. Otto Edwin Liess
Final mark: 110/110 magna cum laude.

List of Publications and Preprints

[16] S. Biagi, E. Valdinoci and E. Vecchi, *A symmetry result for cooperative elliptic systems with singularities*, submitted.
Available at: https://arxiv.org/abs/1904.02003

[15] F. Ferrari and E. Vecchi, *Hölder behavior of viscosity solutions of some fully nonlinear equations in the Heisenberg group*, to appear in Topol. Methods Nonlinear Anal.

[14] A. Pinamonti, M. Squassina and E. Vecchi, *Magnetic BV-functions and the Bourgain-Brezis-Mironescu formula*, Adv. Calc. Var. **12**(3), (2019), 225–252.
doi: 10.1515/acv-2017-0019.

[13] S. Biagi, E. Valdinoci and E. Vecchi, *A symmetry result for elliptic systems in punctured domains*, Commun. Pure Appl. Anal. **18**(5), (2019), 2819–2833.
doi: 10.3934/cpaa.2019126.

[12] G. Cupini and E. Vecchi, *Faber-Krahn and Lieb-type inequalities for the composite membrane problem*, Commun. Pure Appl. Anal. **18**(5), (2019), 2679–2691.
doi: 10.3934/cpaa.2019119.

[11] F. Colasuonno and E. Vecchi, *Symmetry and rigidity for the hinged composite plate problem*, J. Differential Equations **266**(8), (2019), 4901–4924.
doi: 10.1016/j.jde.2018.10.011.

[10] H.-M. Nguyen, A. Pinamonti, M. Squassina and E. Vecchi, *Some characterizations of magnetic Sobolev spaces*, to appear in Complex Variables and Elliptic Equations.
doi: 10.1080/17476933.2018.1520850.

[9] A. Fiscella and E. Vecchi, *Bifurcation and multiplicity results for critical magnetic fractional problems*, Electronic J. Differential Equations, Vol. 2018 (2018), No. 153, pp 1–18.

[8] F. Colasuonno and E. Vecchi, *Symmetry in the composite plate problem*, Commun. Contemp. Math. **21**(2), (2019), 1850019.

[7] H.-M. Nguyen, A. Pinamonti, M. Squassina and E. Vecchi, *New characterizations of magnetic Sobolev spaces*, Advances in Nonlinear Analysis **7**(2), (2018), 227–245.
doi: 10.1515/anona-2017-0239.

[6] Z.M. Balogh, J.T. Tyson and E. Vecchi, *Intrinsic curvature of curves and surfaces and a Gauss-Bonnet Theorem in the Heisenberg group*, Mathematische Zeitschrift **287**(1), (2017), 1–38.
doi: 10.1007/s00209-016-1815-6.

[5] A. Fiscella, A. Pinamonti and E. Vecchi, *Multiplicity results for magnetic fractional problems*, J. Differential Equations **263**, (2017), 4617–4633.
doi: 10.1016/j.jde.2017.05.028.

[4] A. Pinamonti, M. Squassina and E. Vecchi, *The Maz'ya-Shaposhnikova limit in the magnetic setting*, J. Math. Anal. Appl. **449**, (2017), 1152–1159.
doi: 10.1016/j.jmaa.2016.12.065.

[3] E. Vecchi, *Steiner formula and Gaussian curvature in the Heisenberg group*, Bruno Pini Mathematical Analysis Seminar **1**, (2016), 97–115.
doi: 10.6092/issn.2240-2829/6693.

[2] Z.M. Balogh, F. Ferrari, B. Franchi, E. Vecchi and K. Wildrick, *Steiner's formula in the Heisenberg group*, Nonlinear Anal. **126**, (2015), 201–217.
doi: 10.1016/j.na.2015.05.006.

[1] B. Franchi, E. Obrecht and E. Vecchi, *On a class of semilinear evolution equations for vector potentials associated with Maxwell's equations in Carnot groups*, Nonlinear Anal. **90**, (2013), 56–69.
doi: 10.1016/j.na.2013.05.019.

Research statement

My research activity has been focused on three main topics so far:

(i) Symmetry properties of solutions of fourth order elliptic PDEs and minimizers of variational problems;
(ii) Magnetic Sobolev spaces and PDEs driven by fractional magnetic operators;
(iii) Geometric Analysis in Carnot groups.

(i) My main interest so far has been the study of qualitative properties of *optimal pairs* of an eigenvalue optimization problem known as *composite plate problem*, that naturally arises in continuum mechanics. The problem can be stated as follows: let $\Omega \subset \mathbb{R}^n$ be an open and bounded set, let A, m, M be positive constants such that $0 < m \leq M < +\infty$. Define

$$\mathcal{R} := \left\{ \rho : \Omega \to \mathbb{R} : m \leq \rho \leq M, \int_\Omega \rho = A \, \rho \neq 0 \, a.e. \right\},$$

as the set of *admissible densities*. From the mathematical point of view it is an eigenvalue optimization problem of the form

$$\inf_{\rho \in \mathcal{R}} \inf_{u \in \mathcal{W}} \frac{\int_\Omega (\Delta u)^2}{\int_\Omega \rho u^2}, \tag{0.1}$$

where $\mathcal{W} = W_0^{2,2}(\Omega)$ or $\mathcal{W} = W^{2,2}(\Omega) \cap W_0^{1,2}(\Omega)$, depending on the model considered, either hinged or clamped plate. A couple (u, ρ) which realizes the infimum in (0.1) is called *optimal configuration*. The Euler-Lagrange equation associated to (0.1) is a fourth order PDE driven by the bilaplacian Δ^2. There are several issues that can be addressed: symmetry properties of the solutions, symmetry breaking phenomena and properties of the free boundary associated to the optimal configuration ρ. In [8], in collaboration with F. Colasuonno (Torino), we proved a symmetry result when Ω is a ball. To be more precise, we showed that there exists a sub-level set of u, $D \subset \Omega$, such that any optimal density ρ is of the form $\rho = m \, \chi_D + M \, \chi_{D^c \cap \Omega}$. Moreover, u is positive, radial and radially decreasing, which gives that D is an annulus.
In [11], in collaboration with F. Colasuonno (Torino), we extended part of these symmetry results in the case of hinged composite plates. In particular, we adopted the moving plane method refined by Berestycki and Nirenberg to be able to consider more general sets. We also studied an overdetermined type problem in the spirit of Serrin.
A *second order* version of the aforementioned problem is the so called *composite membrane problem*, that has been extensively studied in the '00's, starting from a paper by Chanillo, Grieser, Imata, Kurata and Ohnishi. In this framework, in [12] in collaboration with G. Cupini (Bologna), we proved the validity of Faber-Krahn and Lieb-type inequality.

In [13,16], in collaboration with S. Biagi (Ancona) e E. Valdinoci (University of Western Australia) we studied symmetry propoerties of singular solutions of cooperative elliptic systems. More precisely, in [13], following a result by Caffarelli, Li and Nirenberg valid for fullynonlinear scalar

equations, we considered the case of classical solutions in punctured domains. In a subsequent paper [16] we extended the above mentioned result to the case of *bigger singularity sets*, suitably defined in the sense of capacity. In both cases the proof is based on the application of the celebrated *moving planes technique*, which has to be modified in order to face the technical difficulties arising from the presence of singularities.

(ii) The magnetic Sobolev spaces are the natural functional setting to consider when dealing with energies associated to the motion of charged particle under the action of an external magnetic field. Formally, given a vector potential $A : \mathbb{R}^n \to \mathbb{R}^n$, the magnetic Sobolev space (for $p = 2$) is defined as follows:

$$H^1_A(\mathbb{R}^n) := \left\{ u : \mathbb{R}^n \to \mathbb{C} : u \in L^2(\mathbb{R}^n),\, \nabla u - iAu \in L^2(\mathbb{R}^n) \right\}.$$

Analogous definitions can be given on $\Omega \subset \mathbb{R}^n$ and for $p \neq 2$. The physically relevant situation is provided by $p = 2$ and for $n = 3$: in this case the magnetic field B acting on the particle is given by $B = \mathrm{curl} A$. A quite natural question that arise in this context is the validity of Bourgain-Brézis-Mironescu-type formulas, or even more general characterizations of these spaces in the spirit of the works by Nguyen. A first positive answer is contained in [14], where, in collaboration with A. Pinamonti (Trento) and M. Squassina (Brescia), we proved the following: let $A : \mathbb{R}^n \to \mathbb{R}^n$ be of class C^2, let $p \geq 1$ and let $\Omega \subset \mathbb{R}^n$ be an open and bounded set with Lipschitz boundary. Then

$$\lim_{s \nearrow 1} (1-s) \int_\Omega \int_\Omega \frac{|u(x) - e^{\mathrm{i}(x-y)\cdot A\left(\frac{x+y}{2}\right)} u(y)|_p^p}{|x-y|^{n+ps}} dxdy = Q_{p,n} \int_\Omega |\nabla u - \mathrm{i}A(x)u|_p^p \, dx,$$

for every $u \in W^{1,p}_A(\Omega)$.
Following the proofs of Davila and Ponce we also proved the validity of such kind of formula for a magnetic BV functions, a notion that we introduced and for which we developed the counterparts of the classical results holding for BV functions.
In [4], in collaboration with A. Pinamonti (Trento) and M. Squassina (Brescia), we proved the magnetic version of a result due to Maz'ya and Shaposhnikova, a result that can be considered as complementary to the Bourgain-Brézis-Mironescu formula. In particular, we proved the following: let $n \geq 1$ and $p \in [1, \infty)$, then for every

$$u \in \bigcup_{0<s<1} D^{s,p}_{A,0}(\mathbb{R}^n, \mathbb{C}),$$

it holds that

$$\lim_{s \searrow 0} s \int_{\mathbb{R}^n} \int_{\mathbb{R}^n} \frac{|u(x) - e^{\mathrm{i}(x-y)\cdot A\left(\frac{x+y}{2}\right)} u(y)|^p}{|x-y|^{n+ps}} dxdy = \frac{4\pi^{n/2}}{p\Gamma(n/2)} \|u\|^p_{L^p(\mathbb{R}^n)},$$

where the space $D^{s,p}_{A,0}(\mathbb{R}^n, \mathbb{C})$ denotes the closure of $C^\infty_c(\mathbb{R}^n, \mathbb{C})$ with respect to a suitable magnetic fractional norm.

More recently, in [7], I studied further characterizations of magnetic Sobolev spaces based on the works by Nguyen. Here is a brief account of the results proved in collaboration with H.-M. Nguyen (EPFL), A. Pinamonti (Trento) and M. Squassina (Brescia). Define

$$\Psi_u(x,y) := e^{\mathrm{i}(x-y)\cdot A\left(\frac{x+y}{2}\right)} u(y), \qquad x, y \in \mathbb{R}^n$$

and

$$J_\delta(u) := \iint_{\{|\Psi_u(x,y) - \Psi_u(x,x)| > \delta\}} \frac{\delta^2}{|x-y|^{n+2}} \, dxdy, \quad \text{for } u \in L^1_{\mathrm{loc}}(\mathbb{R}^n), \qquad \delta > 0,$$

and let $A : \mathbb{R}^n \to \mathbb{R}^n$ be a Lipschitz vector potential. Then $u \in H^1_A(\mathbb{R}^n)$ if and only if $u \in L^2(\mathbb{R}^n)$ and

$$\sup_{0<\delta<1} J_\delta(u) < +\infty.$$

Moreover, if $u \in H^1_A(\mathbb{R}^n)$ it holds that

$$\lim_{\delta \searrow 0} J_\delta(u) = Q_N \int_{\mathbb{R}^N} |\nabla u - \mathrm{i}A(x)u|^2 \, dx.$$

The proofs of the results mentioned so far follow the proof of the results for the classical Sobolev spaces. The main difficulty comes from the presence of the vector potential A, which creates extra terms that need to be controlled in order to get results consistent with the classical ones.

Recently, D'Avenia and Squassina introduced also a nonlocal operator called *magnetic fractional Laplacian*. I am interested in generalizations of classical results also to this new class of non-local operators. In this direction, I refer to the papers [5,9]. In [5], together with A. Fiscella (Campinas) and A. Pinamonti (Trento), we proved the existence of multiple weak solution of the following nonlinear boundary value problem:

$$\begin{cases} (-\Delta)^s_A u = \lambda f(|u|)u, & \text{in } \Omega, \\ u = 0, & \text{in } \mathbb{R}^n \setminus \Omega, \end{cases} \tag{0.2}$$

where $\Omega \subset \mathbb{R}^n$ is an open and bounded set with Lipschitz boundary and f is a certain sub-critical non-linearity. The proof of this result is purely variational and requires the introduction of a proper function space where to settle the problem. To this aim we adapted to our setting a previous idea of Servadei and Valdinoci.
In [9], together with A. Fiscella (Campinas) we studied bifurcation and multiplicity results for the magnetic critical fractional problem

$$\begin{cases} (-\Delta)^s_A u = \lambda u + |u|^{2^*_s - 2} u, & \text{in } \Omega, \\ u = 0, & \text{in } \mathbb{R}^n \setminus \Omega, \end{cases}$$

In particular, we extended to this case a nowadays classical result due to Cerami, Fortunato and Struwe.

(iii) My main interest concerns higher order curvatures of smooth embedded surfaces in Carnot groups. In [2,6], in collaboration with Z. Balogh (Bern), F. Ferrari (Bologna), B. Franchi (Bologna), J.T. Tyson (Urbana) and K. Wildrick (Montana), I studied curvature properties of smooth embedded surfaces in the first Heisenberg. In particular, we were interested in defining a suitable notion of *horizontal Gauss curvature* away from characteristic points.
More recently, in [15] in collaboration with F. Ferrari (Bologna) we started the study of the regularity of viscosity solutions for a class of fully nonlinear PDE's in the first Heisenberg group.

Teaching activity and teaching statement

During my PhD at the University of Bern, I have been teaching assistant of 10 courses both at the bachelor and master level. The bachelor courses were taught in German, while the master ones in English. My duty as a teaching assistant was to hold weekly exercise sessions of about 1-2 hours and then to mark all the exercise sheets the students were handing in weekly. The typical exercise session was organized as follows: a first part in which I was solving exercises at the blackboard, and a second part in which the students could ask questions and/or hints (but not to explicitly solve) related to the new exercises they had to hand in at the end of the exercise session. An important complementary activity was the *office hour* during which the students could come to

discuss about the results achieved in their exercise sheets. This activity lasted from the Spring Semester 2012-2013 to the Spring Semester 2014-2015.

During the two years as a Marie-Curie Post-Doc spent at the University of Bologna, I have been teaching assistant for the courses of Mathematical Analysis I(TA) - II(TB) at the faculty of Engineering of Bologna. My duty as a teaching assistant was to solve exercises on selected topics of the course, aiming at preparing the students for the written exam. Parallel to this activity I held regular office hours.

In the Fall semester 2017-2018, I held the course "Crash course in Mathematics" for the Bachelor's degree in Economics at the University of Bologna, for a total amount of 24 hours. The content of the course was a review (at a higher level) of the high school topics necessary to attend more advanced courses along the years.

- **2018-2019 (Spring semester):** Teaching assistant for the course Mathematical Analysis I, Bachelor's degree in Mathematics, University of Trento.
- **2017-2018 (Fall semester):** Teacher of the course "Crash course in Mathematics", Bachelor's degree in Economics, University of Bologna.
- **2016-2017 (Fall semester):** Teaching assistant for the course Mathematical Analysis TA, Bachelor's degree in Engineering, University of Bologna.
- **2015-2016 (Spring semester):** Teaching assistant for the course Mathematical Analysis TB, Bachelor's degree in Engineering, University of Bologna.
- **2015-2016 (Fall semester):** Teaching assistant for the course Mathematical Analysis TA, Bachelor's degree in Engineering, University of Bologna.
- **2014-2015 (Spring semester):** Teaching assistant for the course Mathematics II, Bachelor's degree in Natural sciences, University of Bern.
- **2014-2015 (Fall semester):** Teaching assistant for the course Ordinary Differential Equations, Bachelor's degree in Mathematics, University of Bern.
- **2014-2015 (Fall semester):** Teaching assistant for the course Mathematics I, Bachelor's degree in Natural sciences, University of Bern.
- **2013-2014 (Spring semester):** Teaching assistant for the course Mathematics II, Bachelor's degree in Natural sciences, University of Bern.
- **2013-2014 (Fall semester):** Teaching assistant for the course Nonlinear PDEs, Master's degree in Mathematics, University of Bern.
- **2013-2014 (Fall semester):** Teaching assistant for the course Mathematics I, Bachelor's degree in Natural sciences, University of Bern.
- **2012-2013 (Spring semester):** Teaching assistant for the course Mathematics II, Bachelor's degree in Natural sciences, University of Bern.
- **2012-2013 (Fall semester):** Teaching assistant for Analysis Seminar, Master's degree in Mathematics, University of Bern.
- **2012-2013 (Fall semester):** Teaching assistant for the course Mathematics I, Bachelor's degree in Natural sciences, University of Bern.
- **2012-2013 (Spring semester):** Teaching assistant for the course Differential Geometry, Bachelor's degree in Mathematics, University of Bern.
- **2010-2011 (Fall semester:)** Teaching assistant for the course Mathematics, Bachelor's degree in Industrial Chemistry, University of Bologna (Polo di Ravenna).

Talks and Seminars

- **Title:** Symmetry and rigidity for composite membranes and plates, June 13, 2019.
  Workshop "Something about nonlinear problems", University of Bologna.
- **Title:** Symmetry and rigidity for composite membranes and plates, February 21, 2019.
  Analysis Seminar "P(n)/N(p): Problemi differenziali nonlineari/Nonlinear differential problems", Sapienza University of Roma, Roma, Italy.
- **Title:** Symmetry and rigidity for composite membranes and plates, November 9, 2018.
  Analysis Seminar, University of Trento, Trento, Italy.
- **Title:** Steiner formula and Gauss curvature in the Heisenberg group, May 31, 2018.
  Workshop: Variational and PDE problems in Geometric Analysis, Bologna, Italy.
- **Title:** Gauss curvature in the Heisenberg group, May 10, 2018.
  Geometry Seminar, University of L'Aquila, L'Aquila, Italy.
- **Title:** Symmetry in the hinged and clamped composite plate problem, May 7, 2018.
  Workshop: A.MA.CA. - Analisi MAtematica al CAstelnuovo, Roma, Italy.
- **Title:** Symmetry results for hinged and clamped composite plate problems, March 27, 2018.
  Workshop: Viscosity and variational solutions of nonlinear PDEs, Bologna, Italy.
- **Title:** Symmetry results for optimal pairs in the composite plate problem, January 26, 2018.
  Conference: Sub-Riemannian Geometry, Harmonic Analysis, PDE and Applications, Bologna, Italy.
- **Title:** Symmetry results for optimal pairs in the composite plate problem, December 18, 2017.
  EDP e DINTORNI, III Meeting around PDE, University of Bari, Italy.
- **Title:** Gauss curvature in the Heisenberg group via Riemannian approximation, May 26, 2017.
  Workshop: Brescia-Trento Nonlinear Days, University of Trento, Italy.
- **Title:** Horizontal Gauss curvature in the Heisenberg group, May 25, 2017.
  International Conference on Elliptic and Parabolic Problems, Gaeta, Italy.
- **Title:** Bourgain-Brezis-Mironescu formula in the magnetic setting, January 18, 2017.
  MAnET Metric Analysis Meeting, Université Paris-Sud, France.
- **Title:** Steiner formula in the Heisenberg group, April 27, 2016.
  Workshop: 3 days on Evolution PDEs, University of Salerno, Italy.
- **Title:** Steiner formula in the Heisenberg group, April 7, 2016.
  Bruno Pini Mathematical Analysis Seminar, University of Bologna, Italy.
- **Title:** Gauss curvature in the Heisenberg group: a proposal, December 8, 2015.
  Mid-Term Review Meeting of MAnET Project, University of Helsinki, Finland.
- **Title:** Aleksandrov's estimates and Normal mapping in the Heisenberg group, June 12, 2013.
  Bern Analysis Micro-Conference, University of Bern, Switzerland.

Scientific Visits

- Sapienza University of Roma, collaboration with Prof. Adriano Pisante (28/02 - 01/03/2019).
- University of Milano, collaboration with Prof. Enrico Valdinoci (14/12/2018).
- Univeristy of Nice (France), collaboration with Prof. Séverine Rigot. (01/06/2017-09/06/2017).
- Univeristy of Nice (France), collaboration with Prof. Séverine Rigot. (20/02/2017-10/03/2017).
- University of Nice (France), collaboration with Prof. Séverine Rigot. (24/11/2016-25/11/2016).

- University of Padova (Italy), collaboration with Dr. Andrea Pinamonti. (04/11/2016).
- University of Bern (Switzerland), collaboration with Prof. Zoltán Balogh and Prof. Jeremy Tyson. (07/03/2016-12/03/2016).
- University of Milano (Italy), collaboration with Prof. Andrea Calogero. (24/02/2016).
- University of Bern (Switzerland), collaboration with Prof. Zoltán Balogh. (19/10/2015-21/10/2015).
- University of Bologna (Italy), collaboration with Prof. Bruno Franchi. (03/03/2014-06/03/2014).

Intensive Schools, Workshops and Conferences

- European Mathematical Society Summer School "Partial differential equations from theory to applications", Milano (Italy), July 1-4, 2019.
- 11th School on Analysis and Geometry in Metric Spaces, Levico Terme (Italy), June 24-26, 2019.
- Workshop "Something about nonlinear problems", Bologna (Italy), June 13-14, 2019.
- Variational and PDE problems in Geometric Analysis II, Bologna (Italy), May 23-24, 2019.
- Some topics of Geometric Analysis and Geometric Measure Theory, Pisa (Italy), April 16-17, 2019.
- From Optimal Control to Maximum Principle, Agropoli (Italy), September 12-14, 2018.
- Meeting in Applied Mathematics and Calculus of Variations, Rome (Italy), September 3-6, 2018.
- Two Days on PDEs - Bruno Pini Centenary Conference, Bologna (Italy), June 21-22, 2018.
- Recent advances in Geometric Analysis, Pisa (Italy), June 4-8, 2018.
- Variational and PDE problems in Geometric Analysis, Bologna (Italy) May 31- June 1, 2018.
- A.MA.CA. - Analisi MAtematica al CAstelnuovo, Roma (Italy), May 7, 2018.
- Viscosity and variational solutions of nonlinear PDEs, Bologna (Italy), March 27, 2018.
- Sub-Riemannian Geometry, Harmonic Analysis, PDE and Applications, Bologna (Italy), January 24-27, 2018.
- 2^{nd} *Italian-Chilean Workshop in PDE's*, INDAM, Roma (Italy), January 15-19, 2018.
- EDP e DINTORNI, III Meeting around PDE, University of Bari (Italy), December 18, 2017.
- CIME-CIRM Course on New Trends on Analysis and Geometry in Metric Spaces (10th School), Levico Terme (Italy), June 26-30, 2017.
- Brescia-Trento Nonlinear Days - Edition I, Trento (Italy), May 26, 2017.
- International Conference on Elliptic and Parabolic Problems, Gaeta (Italy), May 22-25, 2017.
- James SERRIN: from His legacy to the new frontiers, Perugia (Italy), January 30- February 3, 2017.
- MAnET Metric Analysis Meeting, Paris (France), January 18-19, 2017.
- A mathematical tribute to Ennio De Giorgi, Pisa (Italy), September 19-23, 2016.
- Singular Phenomena and Singular Geometries, Pisa (Italy), June 20-23, 2016.
- Two-day Meeting on linear and nonlinear PDE's in honor of the 65th birthday of Christian Gutiérrez, Bologna (Italy), June 9-10, 2016.
- 3 days on Evolution PDEs, Fisciano (Italy), April 27-29, 2016.
- Mid-Term Review Meeting of MAnET Project, Helsinki (Finland), December 8-9, 2015.
- 9th School on Analysis and Geometry in Metric Spaces, Levico Terme (Italy), July 06-10, 2015.

- Workshop on Geometric Analysis in the Heisenberg group, Bologna (Italy), March 4-6, 2015.
- MAnET Workshop on sub-Riemannian Analysis, PDE's and Applications, Bern (Switzerland), January 26-30, 2015.
- Workshop on Geometric Analysis on sub-Riemannian manifolds, Paris (France), September 29- October 4, 2014.
- 8th School on Analysis and Geometry in Metric Spaces, Levico Terme (Italy), June 16-20, 2014.
- Norwegian Summer School on analysis and geometry, Bergen (Norway), June 24-28, 2013.
- Geometric Methods in PDE's, Cortona (Italy), May 27-31, 2013.
- Bern Analysis Micro-Conference, Bern (Switzerland), June 12, 2013.
- Sub-Riemannian Geometry and PDE's, Levico Terme (Italy), July 2-5, 2012.
- SMI Summer School *Hyperbolic systems of conservation laws*, Cortona (Italy), August 22-September 3, 2011.

Organizing activities

- Organizer (together with S. Biagi and S. Dipierro) of the Special Session "Analysis of PDEs and Free Boundary Problems" within the "13th AIMS Conference on Dynamical Systems, Differential Equations and Applications", Atlanta (USA), June 5-9, 2020.
- Organizer (together with D. Mazzoleni, A. Pinamonti and M. Squassina) of the Third Edition of "Brescia-Trento Nonlinear Day", Trento (Italy), May 31, 2019.
- Member of the Organizing Committee of the International Conference *Sub-Riemannian Geometry, Harmonic Analysis, PDE and Applications*, Bologna (Italy), January 24-27, 2018.

Research Projects

- Member of the Indam-GNAMPA project (2018): "Problemi di curvatura relativi ad operatori ellittico-degeneri". Principal Investigator: Dr. Giulio Tralli (Sapienza University of Roma).
- Member of ALMA IDEA-Grant Junior project (2017): "Transizioni di fase nei modelli disordinati in campo medio". Principal Investigator: Dr. Emanuele Mingione (University of Bologna).
- Member of the Indam-GNAMPA project (2017): "Problemi nonlocali e degeneri in $\mathbb{R}^n$". Principal Investigator: Dr. Andrea Pinamonti (University of Trento).

Referee activity for scientific journals

- Advances in Nonlinear Analysis, Discrete and Continuous Dynamical Systems.

Languages

Italian (native speaker).
English (fluent), First Certificate English Grade B (2004).
German, B2-level.

Informatics knowledge

Good knowledge of: Matlab, LaTeX and Microsoft Office pack.

Other information

2 letters from the Rectorship of the University of Bologna due to scholastic credits.
AUSER voluntary worker, from September 2007 to December 2011.

Contacts for References

Prof. Zoltán Balogh
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Prof. Enrico Valdinoci
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Trento, July 26, 2019.

In faith,
Eugenio Vecchi

DIPLOM

UNIVERSITÄT BERN

The Faculty of Science
hereby certifies that

Eugenio Vecchi

from Italy, born on 10 November 1987

having submitted the thesis on
Steiner formula and Gauss-Bonnet theorem in the Heisenberg group

is in accordance with the regulations of the University of Bern admitted to the degree of

PhD of Science in Mathematics

Final assessment: **insigni cum laude**

Bern, 29 October 2015

The Dean

Prof Dr Gilberto Colangelo

The Rector

Prof Dr Martin Täuber

Seen for legalization:
Bern, May 17th, 2017

ERZIEHUNGSDIREKTION DES KANTONS BERN

Cantonal Department of Education
Office of Higher Education
Section of University

Daniela Pedinelli
Head

CANTONE DI BERNA * CANCELLERIA DI STATO *

Tassa: CHF 25.—

APOSTILLE
(Convention de La Haye du 5 octobre 1961)

1. **Stato: Confederazione Svizzera, Cantone di Berna**
   Il presente atto pubblico
2. **è stato firmato da** Daniela Pedinelli
3. **operante in qualità di** capo
4. **è munito del sigillo / bollo di** Direzione dell'educazione del Cantone di Berna

Attestato

5. **a Berna** Rose Zaugg-Giró 6. **il** 17/05/2017
7. **da**
   funzionario / a della Cancelleria di Stato del cantone di Berna
8. **col numero:** 4608
9. **Sigillo / bollo**
10. **Firma**

CANTONE DI BERNA * CANCELLERIA DI STATO *

Ambasciata d'Italia Berna

Cancelleria Consolare

Codice Sede: 2500100

La Cancelleria Consolare dell'Ambasciata d'Italia a Berna

VISTO l'Accordo tra il Consiglio Federale Svizzero e il Governo della Repubblica Italiana sul Reciproco riconoscimento delle equivalenze nel settore universitario concluso il 7 dicembre 2000.

VISTO il titolo accademico allegato e corredato della traduzione, attestante il conseguimento del titolo accademico "PhD DOCTOR of SCIENCE in Mathematics", rilasciato dall'Universität Bern in data 29 ottobre 2015, al Signor Eugenio Vecchi, nato il 10.11.1987;

DICHIARA

- La Universität Bern è un Istituto accademico statale svizzero che rilascia titoli riconosciuti in tutto il territorio elvetico e compreso nell'elenco allegato A al suddetto Accordo italo-svizzero;
- La durata normale del corso di studi per il conseguimento del titolo di "PhD DOCTOR of SCIENCE in Mathematics" è di quattro anni accademici, corrisponde al dottorato di ricerca (PHD) italiano;
- il signor Eugenio Vecchi ha conseguito il titolo di "PhD of Science in Mathematics" in data 29 ottobre 2015, con il giudizio "insigni cum laude".

Berna, 18 maggio 2017 n. 15/2017

AMBASCIATA D'ITALIA BERNA

Paola MASTROPIETRO
Capo della Cancelleria Consolare

AMBASCIATA D'ITALIA
BERNA
18/05/2017
VECCHI EUGENIO
Num. registro: 2723
Art. T.C.: 66N
Euro: 41,000
Valuta: 43,850
Arrot.: 43,850

TRADUZIONE

...niversità di Berna, Facoltà di Scienze assegna a

Eugenio Vecchi
Nato il 10.11.1987
Cittadino italiano

A seguito della tesi "Steiner formula and Gauss-Bonnet theorem in the Heisenberg group", il titolo

PhD in Scienze matematiche

Voto: insigni cum laude

Il Decano Prof. Dr. Gilberto Colangelo (firma illeggibile

Il Rettore Prof. Dr. Martin Täuscher (firma illeggibile)

Berna, 29 ottobre 2015

Omissis

m_pi - Ministero dell'Istruzione, dell'Università e della Ricerca
AOODPFSR - DIPARTIMENTO PER LA FORMAZIONE SUPERIORE E LA RICERCA
REGISTRO DECRETI
0002081 - 02/08/2018 - REGISTRAZIONE
Classifiche: 02.03.08
Allegati : 0

Ministero dell'Istruzione, dell'Università e della Ricerca

Dipartimento per la Formazione Superiore e per la Ricerca
Direzione Generale per lo Studente, lo Sviluppo e l'Internazionalizzazione della Formazione Superiore

VISTO l'art. 74 del D.P.R. 11 luglio 1980, n. 382, recante il "Riordinamento della docenza universitaria, relativa fascia di formazione nonché sperimentazione organizzativa e didattica";

VISTA la Legge 3 luglio 1998, n. 210, recante norme per la disciplina dei corsi di dottorato di ricerca ed in particolare l'art. 4 come modificato dall'art. 19 della Legge 30 dicembre 2010, n. 240;

VISTO il D.L.vo 30 luglio 1999, n. 300, e in particolare, l'articolo 2, comma 1, n. 11), come modificato dal D.L. 16 maggio 2008, n. 85, convertito, con modificazioni, dalla Legge 14 luglio 2008, n. 121, con il quale è stato istituito il Ministero dell'istruzione, dell'università e della ricerca;

VISTO il D.M. 8 febbraio 2013, n. 45, concernente il "Regolamento recante modalità di accreditamento delle sedi e dei corsi di dottorato e criteri per l'istituzione dei corsi di dottorato da parte degli enti accreditati";

VISTA la documentata richiesta del dott. Eugenio VECCHI intesa ad ottenere che il titolo di *PhD,* conferito da Universität Bern (Svizzera) il giorno 29 ottobre 2015 con una tesi intitolata: "*Steiner formula and Gauss-Bonnet theorem in the Heisenberg group*" sia riconosciuto equipollente al titolo di Dottore di ricerca ai sensi del D.P.R. 11 luglio 1980, n. 382;

ACCERTATA l'esistenza di tutti i requisiti richiesti dalla esposta normativa;

SU conforme parere del Consiglio Universitario Nazionale espresso nella adunanza del giorno 23 luglio 2018;

DECRETA

Il titolo di *PhD* conferito da Universität Bern (Svizzera) il giorno 29 ottobre 2015 al dott. Eugenio VECCHI, nato a Bologna (BO) il giorno 10 novembre 1987, cittadino italiano, è dichiarato equipollente al titolo di Dottore di ricerca dell'ordinamento universitario italiano.

Roma, . 2 AGO 2018

IL DIRETTORE GENERALE
(Dott.ssa Maria Letizia Melina)

Ministero dell'Economia e delle Finanze
MARCA DA BOLLO
€16,00
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Agenzia Entrate
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0 1 17 176273 385 7

Ministero dell'Istruzione, dell'Università e della Ricerca