

Gianluca Crippa

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Personal

Born in Lecco (Italy) on April 30, 1981.

Italian citizen. Swiss resident, C permit.

Current position: Associate Professor in Analysis, University of Basel, Switzerland.

Academic Positions

Since Fall 2012: Extraordinarius (tenured Associate Professor) in Analysis, University of Basel.

Fall 2011 – Fall 2012: Assistant Professor (tenure track) in Analysis, University of Basel.

Fall 2007 – Fall 2011: Assistant Professor (Ricercatore Universitario, tenured), University of Parma, Italy.

Education

Award of the PhD with thesis directed by Luigi Ambrosio and Camillo De Lellis. *Diploma di Perfezionamento in Matematica* with distinction (Scuola Normale Superiore di Pisa, awarded on 4 Aug. 2008) and title of *Doctor scientiarum naturalium* with distinction (University of Zürich, awarded on 29 Jan. 2010, time gap due to the handling of the co-supervision agreement).

Spring 2005: *Diploma di Licenza* with distinction at the Scuola Normale Superiore di Pisa. This is the final degree for the undergraduate program at the Scuola Normale Superiore di Pisa.

Fall 2004 – Fall 2007: PhD studies jointly at the Scuola Normale Superiore di Pisa and the Institute for Mathematics of the University of Zürich (co-supervision).

Summer 2004: *Laurea in Matematica* (equivalent to MSc) with distinction at the University of Pisa. Thesis directed by Luigi Ambrosio.

Fall 2000 – Summer 2004: Undergraduate program in Mathematics, jointly at the Scuola Normale Superiore and the University of Pisa.

Research Projects and Grants

ERC-2015-StG: ERC Starting Grant 676675, *FLIRT: Fluid Flows and Irregular Transport*, 06.2016 – 05.2022, ca. EUR 1 000 000 (PI).

Swiss National Science Foundation B-0020_175428, *Transport, Fluids, and Mixing*, 2017, Publ. grant, ca. CHF 5 500.

Swiss National Science Foundation 200020_156112, *Continuity equations with non smooth velocity: quantitative estimates and applications to nonlinear problems*, 10.2014 – 09.2018, ca. CHF 285 000 (PI).

Ki-Net core participant in the ETH Zürich node, CSCAMM hub (2016 – 2019).

Host of two postdoctoral fellows (Anupam Pal Choudhury and Grzegorz Jamróz) each supported by a “Swiss Government Excellence Scholarship” funded by the State Secretariat for Education, Research and Innovation (SERI) for the period Sept. 2015 – Aug. 2016.

Swiss National Science Foundation 200021_140232, *Continuity equations with non smooth velocity: fluid dynamics and further applications*, 04.2012 – 09.2014, ca. CHF 150 000 (PI).

ERC-2009-StG ConLaws (PI: Stefano Bianchini).

GNAMPA 2008 (PI), GNAMPA 2009 (PI: Simona Fornaro), INdAM 2005 (PI: Benedetto Piccoli). (Note: Network projects funded by the Istituto Nazionale di Alta Matematica, Italy).

PRIN 2004, PRIN 2006, PRIN 2008 (PI: Luigi Ambrosio). PRIN 2012 (PI: Stefano Bianchini). (Note: Network projects funded by the Italian Ministry of University and Research).

Fellowships, Prizes and Awards

2019: Nomination for a *Teaching Excellence Award* of the University of Basel.

Premio Bartolozzi 2013 of the Unione Matematica Italiana.

Spring 2012: *Offer of a Full Professorship* (W3) from the University of Mainz, Germany. Declined.

Spring 2011: *Shortlisted for a Full Professorship* (W3) at RWTH Aachen, Germany.

Prize for the PhD thesis awarded by the University of Zürich.

Fellowships awarded through a competitive public contest for the undergraduate (2000-2004) and graduate (2004-2007) studies, *Scuola Normale Superiore di Pisa*.

Supervision of Undergraduate Students, PhD Students, and Postdocs

Undergraduate students: Marcello Carioni (BSc, Dec. 2009), Alessandra De Gregorio (BSc, Dec. 2010), Michele Terribilini (MSc, Apr. 2011), Silvia Ligabue (BSc, Oct. 2011), Marcello Carioni (MSc, Apr. 2012), Irina Oberlin (MSc, Feb. 2014), Stephan Heule (MSc, Feb. 2014), Silvia Ligabue (MSc, Sept. 2014), Lars Bugiera (MSc, Oct. 2014), Christian Schulze (MSc, Feb. 2015), Fabio Thöny (MSc, Aug. 2015), Lea Zaugg (MSc, May 2017), Benjamin Kessler (MSc, Feb. 2018).

PhD students (at the University of Basel, if not otherwise specified):

- Anna Bohun: “Flows of singular vector fields and applications to fluid and kinetic equations”, defended on September 24, 2015.
- Gennaro Ciampa: “Flows of irregular vector fields and applications to transport and Euler equations”, defended on October 18, 2019 (GSSI L’Aquila, co-advised with S. Spirito).
- Silvia Ligabue: “Anisotropic vector fields: quantitative estimates and applications to the Vlasov-Poisson equation”, defended on November 21, 2019.
- Christian Schulze: “Inviscid mixing by fluid flows: optimal stirring with cellular and radial velocity fields”, defended on March 31, 2021.
- Marco Inversi (since Sept. 2021).
- Stefano Abbate (GSSI L’Aquila, co-advised with S. Spirito, since Sept. 2021).

Postdocs: Stefano Spirito (Sept. 2012 – Aug. 2014), Camilla Nobili (May 2015 – Dec. 2017), Anupam Pal Choudhury (Sept. 2015 – Aug. 2016), Grzegorz Jamróz (Sept. 2015 – Aug. 2016), Renato Lucà (Sept. 2016 – Aug. 2019), Francesco Ghiraldin (Jan. 2017 – Nov. 2018), Elio Marconi (Oct. 2017 – Aug. 2020), Paolo Bonicatto (Oct. 2017 – Sept. 2020), Giuseppe Genovese (Aug. 2019 – July 2021, with D. Belius), Gennaro Ciampa (Oct. 2019 – Sept. 2020), Giorgio Stefani (Feb. 2020 – Jan. 2022), Mickaël Latocca (Sept. 2021 – July 2022), Luigi De Rosa (since Sept. 2021), Jaemin Park (since Aug. 2022).

Organization of Conferences and Schools

“Microlocal Analysis and Applications to PDEs”, Centro di Ricerca Matematica Ennio De Giorgi, Pisa, November 20 – 21, 2006.

Collaboration to the “Second GNAMPA School on Harmonic Analysis and Evolution Equations”, University of Parma, February 4 – 8, 2008.

“Lectures on Relaxation Models and Finite Volumes Methods” (F. Bouchut), University of Parma, May 8 – 13, 2008.

“Some results concerning one dimensional systems of conservation laws” (L. V. Spinolo), University of Parma, September 3 – 12, 2008.

“Intensive Research Month on Hyperbolic Conservation Laws and Fluid Dynamics”, Department of Mathematics of the University of Parma, February 1 – 28, 2010.

Intensive Research Period “Nonlinear Problems in PDEs”, Department of Mathematics of the University of Parma, April 12 – June 12, 2010.

Intensive Research Period “Nonlinear Hyperbolic PDEs, Dispersive and Transport Equations: Analysis and Control”, SISSA, Trieste, May 16 – July 22, 2011. Includes the workshop “Modeling and Control of Nonlinear Evolution Equations” (May 24 – 27) and the conference “Ninth meeting on Hyperbolic Conservation Laws, Fluid Dynamics and Transport Equations: Recent results and Research perspectives” (July 18 – 22).

Organizing Committee of “HYP2012, 14th International Conference on Hyperbolic Problems: Theory, Numerics, Applications”, University of Padova, June 25 – 29, 2012.

“Basel Junior Symposium in Analysis”, Basel, February 12 – 14, 2013.

“10th Meeting on Hyperbolic Conservation Laws and Fluid Dynamics”, University of L’Aquila, July 11 – 12, 2013.

“Two days on Hyperbolic PDEs, Geometric Measure Theory and Optimal Transport”, SISSA, Trieste, October 28 – 29, 2013.

“Summer School on Geometric Measure Theory and Geometric Analysis”, Basel, June 23 – 27 and July 14 – 18, 2014.

“Summer School on Transport, Fluids and Mixing”, Levico Terme, July 20 – 24, 2015.

“11th Meeting on Nonlinear Hyperbolic PDEs and Applications: On the occasion of the 60th birthday of Alberto Bressan”, SISSA, Trieste, June 13 – 17, 2016.

Global Organizing Committee of “11th AIMS conference on Dynamical Systems, Differential Equations and Applications”, Orlando, Florida, July 1 – 5, 2016.

“GSSI Summer School on Fluid Dynamics and Related Topics”, GSSI L’Aquila, July 18 – 22, 2016.

“Workshop on Recent Trends in the Analysis of PDEs”, Pavia, October 19 – 21, 2016.

“Transport phenomena in collective dynamics: from micro to social hydrodynamics”, FIM ETH Zürich, November 1 – 4, 2016.

“Irregular transport: analysis and applications”, Basel, June 26–30, 2017.

“IperPV2017: XXVII Incontro Nazionale sui Problemi di Tipo Iperbolico”, Pavia, September 6 – 8, 2017.

“GMT and PDEs in Basel – A young researchers meeting”, Basel, July 8 – 10, 2019.

“Winter School on Turbulence in Fluids and PDEs”, EPFL, January 27 – 31, 2020.

“Ostrowski Symposium”, Basel, February 13, 2020.

“Transport, Fluids, and Mixing”, Centro di Ricerca Matematica Ennio De Giorgi, Pisa (online), January 2022.

“Regularity and Irregularity in Fluid Dynamics”, mini-symposium at the SIAM Conference on Analysis of Partial Differential Equations, online, March 14 – 18, 2022.

“An afternoon of analysis talks”, Basel, June 9, 2022.

Administration and Service

Administration at the University of Basel

Vice-Head (Fall 2018 – Spring 2019) and Head (Fall 2019 – Spring 2020) of Department.

Head of Mathematics (Fall 2018 – Spring 2020).

Coordination of the outreach activities for the Department (Fall 2019 – present).

Responsible for international students exchanges in Mathematics, University of Basel (Fall 2013 – present).

Member of the Unterrichtskommission (teaching committee) Mathematik (Spring 2014 – Spring 2017).

Senior Council Member of the Swiss Doctoral Program in Mathematics CUSO (Fall 2014 – present).

Vice-President of the Bernoulli-Euler-Society, Basel (Fall 2014 – Fall 2019), member (Fall 2014 – present).

Member of the Directorship of the Bernoulli-Euler-Center, University of Basel (Spring 2015 – present).

Hiring Committee in Mathematics (2013 and 2018).

Scientific Service

Differential and Integral Equations, member of the editorial board (Fall 2013 – present).

Partial Differential Equations and Measure Theory (De Gruyter Open), book series editor (Spring 2014 – present).

Journal of Evolution Equations, member of the editorial board (Fall 2018 – present).

Partial Differential Equations and Applications, member of the editorial board (Spring 2020 – present).

Gran Sasso Science Institute (GSSI), L'Aquila (Italy), member of the Governing Board of the PhD School in Mathematics in Natural, Social and Life Sciences (Fall 2017 – present).

Professorial appointment committee at the University of Zurich (2018).

Mathematics review panel, Academy of Finland (2019).

Reviewer for Swiss National Science Foundation, FONDECYT 2011 Chile, ANVUR Italian Ministry for University and Research (VQR 2004-2010 and 2011-2014), Sino Swiss Science and Technology Cooperation, Oxford Univ. Press, Habilitation at Univ. of Tunis, PRIN projects Italian Ministry for University and Research (2017 and 2020), Isaac Newton Institute for Mathematical Sciences (Cambridge, UK), PhD at Univ. L'Aquila. Reviewer for several math. journals.

PhD committees: Can Gao (EPFL, Sept. 2014), Giulia Cavagnari (Trento, Nov. 2016).

Member of the Unione Matematica Italiana, the Swiss Mathematical Society, the European Mathematical Society, the Association of ERC Grantees, SIAM, SIAG/APDE.

Conferences and Talks Given

2005: Univ. Pisa, Univ. Zürich, Univ. Bonn, School in Pisa, Workshop in Firenze, ENS Paris.

2006: Meeting Levico Terme, SISSA Trieste, Univ. Pisa, Conference Torino, HYP2006, Univ. Lecce, IperPD 2006, Workshop Bertinoro.

2007: Meeting Levico Terme, Univ. Pavia, Univ. Parma, Northwestern University (one-week research course), Univ. Pisa, Meeting SISSA, Congresso UMI Bari (invited speaker).

2008: SISSA Trieste, Univ. Pisa, Univ. Trento, Workshop Pisa, HYP2008, Workshop Pisa.

2009: Meeting Levico Terme, IperBA 2009, Univ. Padova, Conference in Gaeta, Univ. Brest, INdAM period Pavia, INdAM meeting Corinaldo, Univ. Roma Sapienza.

2010: HYP2010, School in Levico Terme, Colloquium Univ. Basel, Univ. Complutense Madrid, Research period ICMAT Madrid, Colloquium RWTH Aachen.

2011: Colloquium Univ. Mainz, Colloquium Univ. Heidelberg, Colloquium Univ. Paderborn, Brown Univ., Two-hours tutorial at workshop at IMECC Campinas, Colloquium Univ. Fribourg CH.

2012: Univ. Orsay, Univ. Zürich, Univ. Besançon, OxpDE Oxford, ETH Zürich, CNR Pavia, HYP2012 (invited speaker), Conference in Bellaterra.

2013: Colloquium Univ. Neuchâtel, Heriot-Watt Univ. Edinburgh (ten-hours research course with L. Ambrosio), Workshop in Banff (talk + panel discussion), CSCAMM Univ. Maryland, Meeting L'Aquila, Workshop Sussex.

2014: Univ. Roma Sapienza, School and workshop GSSI L'Aquila, SISSA Trieste, Colloquium Univ. Bern, Workshop Lyon, EPF Lausanne.

2015: Workshop Besançon, Five-hours research course Sant Feliu, Workshop IHP Paris, Univ. Leipzig, Colloquium Univ. Münster, EquaDiff 2015.

2016: Ten-hours research course GSSI L'Aquila, Colloquium Univ. Basel, Popularization talk SMO-Tag ETH Zürich, Workshop CSCAMM Univ. Maryland, Univ. Padova, Meeting SISSA Trieste, Workshop Oberwolfach, AIMS Orlando, HYP2016, Penn State (students' seminar, colloquium, and three-hours research course), Carnegie Mellon University, MIT, Princeton University, Univ. Trento, Students' seminar Univ. Padova.

2017: Banach Center Warsaw, SIAM Conference on Analysis of Partial Differential Equations (plenary + session).

2018: Univ. Savoie Chambery, Eight-hours research course GSSI L'Aquila, Politecnico di Bari, Workshop GSSI L'Aquila, HYP2018, Workshop Barcelona, Workshop Academia Sinica, Colloquium Univ. Freiburg DE.

2019: Colloquium Univ. Hamburg, Imperial College London, Workshop Münster, EPFL, IperPA2019 (plenary), Workshop Oberwolfach, Summer School at ICMAT Madrid (three-hours research course), PDE seminar Osaka, GSSI L'Aquila.

2020: Ulm (Colloquium + Talk), AMS Fall Eastern Sectional Meeting (online).

2021: Workshop IPAM (online), Virtual Analysis and PDE Seminar (UCSD, online), Karlsruhe PDE Seminar (online), 12-hours research course at GSSI (online), V Workshop on Fluids and PDE (online).

2022: Conference on Mathematics of Wave Phenomena (minisymposium, KIT Karlsruhe, online), Modelling and analysis of turbulent transport, mixing and scaling (INI Cambridge, online), SIAM Conference on Analysis of Partial Differential Equations (PD22, minisymposium, Berlin, online), PDE Seminar at Chinese Academy of Sciences, Summer school on fluids and turbulence (Lyon), Equadiff 15 (Brno, invited speaker), PhD course at EPFL (15 hours).

Visits and Research Stays

2004: Univ. Zürich (C. De Lellis).

2005: Univ. Zürich (C. De Lellis), Univ. Bonn (F. Otto and M. Westdickenberg), ENS Paris (F. Bouchut).

2006: Univ. Zürich (C. De Lellis), SISSA Trieste (S. Bianchini), Univ. Lecce (M. Miranda and D. Pallara), Univ. Paris VI (P. G. LeFloch).

2007: Univ. Zürich (C. De Lellis), Univ. Bonn (F. Otto and M. Westdickenberg), Univ. Pavia (A. Pratelli and G. Savaré), Univ. Paris VI (P. G. LeFloch), Univ. Parma (G. Mingione), Northwestern Univ. (G.-Q. Chen and L. V. Spinolo), SISSA Trieste (S. Bianchini), Univ. Pavia (A. Pratelli).

2008: Scuola Normale Superiore di Pisa (L. Ambrosio), SISSA Trieste (S. Bianchini), Univ. Zürich (C. De Lellis), Univ. Pisa (V. Magnani), Univ. Trento (F. Serra Cassano and D. Vittone), Univ. Pavia (A. Marigonda).

2009: Univ. Pisa (G. Alberti), SISSA Trieste (S. Bianchini), Univ. Padova (F. Ancona), Univ. Brest (C. Jimenez), Univ. Roma Sapienza (A. Davini and A. Siconolfi).

2010: Univ. Pisa (G. Alberti), SISSA Trieste (S. Bianchini), ENS Lyon (C. Donadello and D. Serre), Univ. Paris-Est (F. Bouchut), Univ. Complutense de Madrid (E. Durand Cartagena).

2011: Univ. Zürich (C. De Lellis), Brown Univ. (C. Dafermos).

2012: Univ. Orsay (E. Miot), Univ. Besançon (C. Donadello), OxpDE Oxford (L. Caravenna and G.-Q. Chen), CNR Pavia (L. V. Spinolo).

2013: Univ. Orsay (E. Miot), CSCAMM Univ. Maryland (E. Tadmor).

2014: Univ. Roma Sapienza (G. Crasta and V. De Cicco), SISSA Trieste (S. Bianchini and N. Gusev).

2015: Univ. Leipzig (S. Daneri and L. Székelyhidi), Univ. Pisa (G. Alberti).

2016: Univ. Pisa (G. Alberti), Univ. Padova (L. Caravenna, Visiting Scientist), GSSI L'Aquila (P. Marcati and S. Spirito), CSCAMM Univ. Maryland (P.-E. Jabin), Penn State University (A. Bressan and A. L. Mazzucato, Shapiro Visitor), Carnegie Mellon Univ. (G. Iyer), MIT (G. Staffilani), Princeton Univ. (V. Vicol).

2017: SISSA Trieste (G. De Philippis and N. Gigli), Univ. Nice (P.-E. Jabin).

2018: Univ. Savoie Chambéry (D. Bresch), GSSI L'Aquila (P. Marcati and S. Spirito), Politecnico di Bari (G. Coclite), CSCAMM Univ. Maryland (P.-E. Jabin), Carnegie Mellon Univ. (G. Iyer).

2019: Univ. Hamburg (C. Nobili), Imperial College London (M. Coti Zelati), EPFL (M. Colombo), GSSI L'Aquila (P. Marcati and S. Spirito).

2020: Univ. Ulm (E. Wiedemann).

2021: EPFL (M. Colombo, Visiting Professor for the Spring Semester, three months).

2022: EPFL (M. Colombo, several visits), Stony Brook University (T. Drivas).

Schools and Conferences Attended

2003: Summer School in Harmonic Analysis (SNS Pisa), Summer School in Geometric Measure Theory (CIRM Marseille), Optimal Transport Theory and Applications (SNS Pisa).

2004: Winter School on Transport Equations and Control Theory for PDEs (Bressanone), Giornate di lavoro su questioni di Teoria Geometrica della Misura e di Calcolo delle Variazioni (Levico Terme), 2004 CNA Summer School: Advances in Nonlinear Analysis (Carnegie Mellon University).

2005: Lectures on Transport Equations and Multi-D Hyperbolic Conservation Laws (Bologna), Giornate di lavoro su questioni di Teoria Geometrica della Misura e di Calcolo delle Variazioni (Levico Terme), Recent advances in calculus of variations and PDE's: a young researchers meeting (Pisa), Geometric Measure Theory: Old and New (Les Diablerets), Calculus of variations and non linear partial differential equations (CIME, Cetraro), Summer School on Calculus of Variations (Roma Sapienza), Second Summer School on Analysis and Applied Mathematics (Roma Sapienza), School in Nonlinear Analysis and Calculus of Variations (Pisa), Week-end di lavoro sul Calcolo delle Variazioni (Firenze).

2006: Giornate di lavoro su questioni di Teoria Geometrica della Misura e di Calcolo delle Variazioni (Levico Terme), Boltzmann equation and Fluidodynamic limits (SISSA Trieste), Mathematics and its applications (Torino), HYP2006 (Lyon), IperPD 2006 (Padova), Trimester on Calculus of Variations and Partial Differential Equations (CRM Pisa) (Nonlinear evolution problems, Variational Methods in Material Science, Optimal transport: theory and applications, Lectures on Hamiltonian and Geometric PDE's), Microlocal Analysis and Applications to PDEs (CRM Pisa), Regularity in Hyperbolic Problems (Bertinoro), Recent Advances on the Perona-Malik Equation (CRM Pisa).

2007: Giornate di lavoro su questioni di Teoria Geometrica della Misura e di Calcolo delle Variazioni (Levico Terme), Fifth meeting on Hyperbolic Conservation Laws: recent results and research perspectives (SISSA Trieste), Non-linear hyperbolic equations and related topics (CRM Pisa), XVIII Congresso dell'Unione Matematica Italiana (Bari).

2008: Second GNAMPA School on Harmonic Analysis and Evolution Equations (Parma), Giornate di lavoro su questioni di Teoria Geometrica della Misura e di Calcolo delle Variazioni (Levico Terme), Evolution equations in pure and applied mathematics (Firenze), Lectures on Relaxation Models and Finite Volumes Methods (Parma), Singularities in nonlinear evolution phenomena and applications (CRM Pisa), HYP2008 (CSCAMM Univ. Maryland), Some results concerning one dimensional systems of conservation laws (Parma), Optimal Transportation and Applications (Pisa).

2009: XIX Convegno Nazionale di Calcolo delle Variazioni (Levico Terme), IperBA 2009 (Bari), 6th European Conference on Elliptic and Parabolic Problems (Gaeta), Fifth Summer School in Analysis and Applied Mathematics (Roma Sapienza), INdAM Intensive Period: Geometric properties of nonlinear local and nonlocal problems (Pavia), Summer Program Nonlinear Conservation Laws and Applications (IMA Minneapolis), INdAM Meeting Asymptotic of Complex Systems (Corinaldo), Renato Caccioppoli e l'Analisi Nonlineare (Accademia Lincei Roma).

2010: Intensive Research Month on Hyperbolic Conservation Laws and Fluid Dynamics (Parma), Nonlinear Problems in PDEs (Parma), HYP2010 (Beijing), International Summer School on Mathematical Fluid Dynamics (Levico Terme), Eighth meeting on Hyperbolic Conservation Laws and Fluid Dynamics: Recent results and Research perspectives (SISSA Trieste), Calculus of Variations, Singular Integrals and Incompressible Flows (ICMAT Madrid).

2011: Seminario degli ex-studenti del Dipartimento di Matematica di Parma (Parma), Nonlinear Hyperbolic PDEs, Dispersive and Transport Equations: Analysis and Control (SISSA Trieste) (Modeling and Control of Nonlinear Evolution Equations, Ninth meeting on Hyperbolic Conservation Laws, Fluid Dynamics and Transport Equations: Recent results and Research perspectives), 3rd Workshop on Fluids and PDE (IMECC Campinas).

2012: New Trends in Nonlinear PDEs (CRM Pisa), HYP2012 (Padova), Instabilities in Hydrodynamics (IHP Paris), Applied PDEs in Physics, Biology and Social Sciences (Bellaterra), International Conference on Nonlinear PDE (Oxford), Ostrowski-Symposium (Basel).

2013: Nonlinear PDEs and Geometric Analysis (Ascona), International Conference on Fluids And Variational Methods (Leipzig), XXIII Convegno Nazionale di Calcolo delle Variazioni (Levico Terme), Basel Junior Symposium in Analysis (Basel), Continuity equations and ODE flows with non smooth velocity (Heriot-Watt Edinburgh), Nonlinear Conservation Laws and Related Models (Banff), 10th Meeting on Hyperbolic Conservation Laws and Fluid Dynamics (L'Aquila), Recent Trends in Classical and Complex Fluids (Sussex), Two days on Hyperbolic PDEs, Geometric Measure Theory and Optimal Transport (SISSA Trieste).

2014: XXIV Convegno Nazionale di Calcolo delle Variazioni (Levico Terme), Velocity averaging and hydrodynamic limits of kinetic models (Nachdiplomvorlesung by François Golse, ETH Zürich), School and Workshop Transport Microscales and Fluids (GSSI L'Aquila), Summer School on Geometric Measure Theory and Geometric Analysis (Basel), Analysis and Numerical approximation of PDEs (ETH Zürich), Mathematics of Fluid Dynamics (Lyon), Nonlocal days in Basel (Basel).

2015: Contemporary topics in conservation laws (Besançon), Symposium 50 years of mathematics at the FIM (ETH Zürich), Geometric non-linear analysis: Conference on the occasion of Michael Struwe's 60th birthday (ETH Zürich), Geometric measure theory, optimal mass transportation and PDEs (Sant Feliu De Guixols), Shock Waves and Beyond (IHP Paris), Equadiff 2015 (Lyon), Summer School on Transport, Fluids and Mixing (Levico Terme), XX Congresso dell'Unione Matematica Italiana (Siena).

2016: XXVI Convegno Nazionale di Calcolo delle Variazioni (Levico Terme), Mixing and Mixtures in Geo- and Biophysical Flows: A Focus on Mathematical Theory and Numerical Methods (CSCAMM Univ. Maryland), 11th Meeting on Nonlinear Hyperbolic PDEs and Applications: On the occasion of the 60th birthday of Alberto Bressan (SISSA Trieste), Hyperbolic Techniques in Modelling, Analysis and Numerics (Oberwolfach), 11th AIMS conference on Dynamical Systems, Differential Equations and Applications (Orlando), GSSI Summer School on Fluid Dynamics and Related Topics (GSSI L'Aquila), HYP2016 (RWTH Aachen), Transport phenomena in collective dynamics: from micro to social hydrodynamics (ETH Zürich).

2017: Workshop on Ideal Fluids and Transport (Banach Center, Warsaw), Irregular transport: analysis and applications (Basel), 10 Years of ERC: Aiming for the Stars (CERN, Geneva), Mathematics, Physics, and their Interaction (FIM ETH Zürich), IperPV2017 (Pavia), SIAM Conference on Analysis of Partial Differential Equations (PD17) (Baltimore).

2018: Mathematics and Economics: Trends and Explorations (ETH Zürich), Workshop of the Intensive Program on Fluids and Waves (GSSI L'Aquila), HYP2018 (Penn State), Workshop Geometric Function Theory in Fluid Mechanics (Barcelona), Workshop on Hyperbolic and Kinetic Problems (Academia Sinica, Taipei).

2019: Workshop on Transport, Mixing and Fluids (Münster), XVIII Italian Meeting on Hyperbolic Equations IperPA2019 (Palermo), Nonlinear Hyperbolic Problems: modeling, analysis, and numerics (Oberwolfach), Summer School on Fluid Mechanics (ICMAT Madrid), GMT and PDEs in Basel, 4th Swiss-Japanese PDE seminar (Osaka, Japan).

2020: Winter School at EPFL, AMS Fall Eastern Sectional Meeting (Special session on turbulence and mixing in fluid dynamics, online), Turb1D 2020 (Universidad de Cantabria and Institute Camille Jordan, online).

2021: Workshop Transport and Mixing in Complex and Turbulent Flows IPAM (online), HYP2020/21 Day (online), V Workshop on Fluids and PDE (Campinas, Brasil, online), Remembering Luciano Modica (University of Pisa, online).

2022: Frontiers in analysis of kinetic equations (INI Cambridge, online), Mathematical aspects of turbulence: where do we stand? (workshops: Turbulence: where do we stand and where are we heading?, Rigorous analysis of incompressible fluid models and turbulence, Modelling and analysis of turbulent transport, mixing and scaling, INI Cambridge, online), Transport, Fluids, and Mixing (CRM Pisa, online), Conference on Mathematics of Wave Phenomena (KIT Karlsruhe, online), SIAM Conference on Analysis of Partial Differential Equations (PD22, Berlin, online), HYP22 (Malaga, online), Summer school on fluids and turbulence (Lyon), Equadiff 15 (Brno).

Teaching

Teaching at the University of Basel

Every semester: Analysis Seminar, Perlen-Kolloquium, Joint Analysis Seminar (with ETH and Univ. Zürich).

HS22-FS23: Analysis I & II (1st year Bachelor); Grundbegriffe der Topologie (Proseminar, HS22).

HS21-FS22: Analysis I & II (1st year Bachelor).

FS21: Sabbatical.

HS20: Differential equations and Sobolev spaces (Master).

HS19-FS20: Introduction to Mathematical Fluid Dynamics I & II (Master).

HS18-FS19: Analysis I & II (1st year Bachelor).

HS17-FS18: Analysis I & II (1st year Bachelor); (Gegen)beispiele in der Analysis (Proseminar, FS18).

FS17: Functional Analysis (2nd-3rd year Bachelor).

HS16: Sabbatical.

HS15-FS16: Harmonic Analysis & Function Spaces and Partial Differential Equations (Master).

HS14-FS15: Analysis I & II (1st year Bachelor).

HS13-FS14: Infinitesimalrechnung I & II (1st year Bachelor); Introd. to Math. Fluid Dynamics (Seminar, FS14).

HS12-FS13 Introduction to Geometric Measure Theory & Theory of Partial Differential Equations (Master).

HS11-FS12: Theory of Partial Differential Equations & Introduction to Harmonic Analysis (Master).

Teaching at the University of Parma

Between 2007 and 2001: Several courses on basic mathematics and statistics for students in food sciences.

Fall 2008: Geometric Measure Theory (Master in Mathematics).

Fall 2009: Measure Theory and Integration (Bachelor in Mathematics).

Publications

Most publications are available for download at: <https://dmi.unibas.ch/en/persons/gianluca-crippa-1/>

Journal Articles (peer-reviewed)

- [J1] L. AMBROSIO, G.C. & S. MANIGLIA: *Traces and fine properties of a BD class of vector fields and applications*. Ann. Fac. Sci. Toulouse Math. (6) **14** (2005), no. 4, 527–561.
- [J2] G.C. & C. DE LELLIS: *Oscillatory solutions to transport equations*. Indiana Univ. Math. J. **55** (2006), no. 1, 1–13.
- [J3] F. COLOMBINI, G.C. & J. RAUCH: *A note on two-dimensional transport with bounded divergence*. Comm. Partial Differential Equations **31** (2006), no. 7, 1109–1115.
- [J4] F. BOUCHUT & G.C.: *Uniqueness, renormalization and smooth approximations for linear transport equations*. SIAM J. Math. Anal. **38** (2006), no. 4, 1316–1328.
- [J5] G.C. & C. DE LELLIS: *Estimates and regularity results for the DiPerna–Lions flow*. J. Reine Angew. Math. **616** (2008), 15–46.
- [J6] L. AMBROSIO, G.C. & P. G. LEFLOCH: *Leaf superposition property for integer rectifiable currents*. Netw. Heterog. Media **3** (2008), no. 1, 85–95.
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