Gianluca Crippa

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Personal

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

Italian citizen. Swiss resident, C permit.

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

Academic Positions

Since Spring 2024: Ordinarius (tenured Full Professor) in Analysis, University of Basel.

Fall 2012 – Fall 2023: Extraordinarius (tenured Associate Professor) in Analysis, University of Basel.

Fall 2011 – Spring 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

Swiss National Science Foundation 200021E_217527, *Inhomogeneous and compressible fluids: statistical solutions and dissipative anomalies*, 09.2023 – 08.2026. DFG – SNF project within the DFG Priority Programme "Hyperbolic Balance Laws in Fluid Mechanics: Complexity, Scales, Randomness (CoScaRa)" (SPP 2410). Co-PI together with Emil Wiedemann (Univ. Erlangen). Total funding ca. CHF 190 000 + EUR 220 000.

Host of the Ambizione Fellowship (216083) of Jaemin Park, 09.2023 – 08.2027, ca. CHF 500 000. The fellowship terminated in August 2024 when Dr. Park started a professorship.

Swiss National Science Foundation 200021_212573, *FLUTURA: Fluids, Turbulence, Advection*, 05.2023 – 04.2027, ca. CHF 1 050 000 (PI).

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

(After its conclusion, my ERC project has been selected by the EU Publication Office to be featured in a popularization online article available at this link).

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 and 2025: 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, with E. Lenzmann), Christian Schulze (MSc, Feb. 2015), Fabio Thöny (MSc, Aug. 2015), Lea Zaugg (MSc, May 2017), Benjamin Kessler (MSc, Feb. 2018), Stefan Strebel (MSc, Feb. 2023, with R. Monti).

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).
- Matteo Nesi (since Sept. 2023).
- Alessandro Violini (since Sept. 2023).
- Mohsen Shahidkalhori (since Jan. 2025).

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 (Aug. 2022 – Aug. 2024), Luis Martinez Zoroa (since Sept. 2023), Immanuel Ben-Porath (since Oct. 2024), Kwan Woo (since mid Sept. 2025).

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 24–28, 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.

"Analysis & beyond: a conference in honour of Luigi Ambrosio's 60th birthday", FIM-ETH, Zürich, September 11–15, 2023.

"An afternoon of analysis talks", Basel, July 12, 2024.

Administration and Service

Administration at the University of Basel

Member of the Faculty Award Committee (Fakultätspreiskommission) for PhD theses at the Faculty of Science (Spring 2024 – present).

Representative of the Faculty of Science in the Doctoral Board of the Institute for Educational Sciences (Promotionsausschuss der Institut für Bildungswissenschaften) (Spring 2023 – present).

Member of the Patronage Board ("Trägerschaf") of the Doctoral Program Data Science (Spring 2023 – present). Member of Program Committee of workshop "Novel Trends in Data Science (NTDS 2023)".

Coordination of the outreach activities for the Department (Fall 2019 – Spring 2024).

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

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

Head of Mathematics (Fall 2018 – Spring 2020).

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).

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

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

Hiring Committee in Mathematics (2013, 2018, 2024).

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).

Member of the Program Committee of the Workshop "Novel Trends in Data Science" (NTDS 2023), Conference Center Stefano Franscini, October 22 – 25, 2023.

Reviewer for Swiss National Science Foundation (SNSF Professorships, Ambizione Fellowships), 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, Tenure and Promotion at Chinese Academy of Sciences and at a US University, Initiatives de Recherche Grenoble Alpes 2023, Full Professorship at a German University, Habilitation at a German University, National Science Centre Poland, Deutsche Forschungsgemeinschaft (DFG), European Research Council (ERC). 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).

2023: Warwick Mathematics Colloquium, Meeting in Erice, Conference in Mulhouse, RISM Summer School, BIRS Banff workshop, VI Workshop on Fluids and PDE (Campinas, online), Zurich Colloquium in Applied and Computational Mathematics, AIM Caltech workshop.

2024: Colloquium FAU Erlangen-Nürnberg, Colloquium Research Training Group 2339 IntComSin (Erlangen), Invited talk at CoScaRa kick-off meeting (Stuttgart), Talk at Uni Heidelberg, Colloquium at Univ. Fribourg, 4-hours research course at EVEQ 2024 (Prague), Talk at Będlewo Fluids Conference, Talk at CoScaRa workshop Mannheim, Talk at INdAM conference Roma (online), Talk at RMU Seminar SoCo PDEs Darmstadt, Talk at Singularities in Fluids and General Relativity (IMS Singapore).

2025: Talk Uni Pavia, Popularization Talk Collegio Ghislieri Pavia.

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 Chambery (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).

2023: Univ. Zürich (Rémi Abgrall), Imperial College London (M. Coti Zelati).

2024: FAU Erlangen-Nürnberg (E. Wiedemann), Univ. Fribourg (E. Le Donne).

2025: CNR Pavia (L. V. Spinolo).

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).

2023: Meeting/school in Erice, Conference on PDEs and applications (GSSI L'Aquila, online participation), Conference Applied Analysis Mulhouse, RISM Summer School Varese, Conference FIM-ETH, BIRS Banff workshop, VI Workshop on Fluids and PDE (Campinas, online), AIM Caltech workshop.

2024: CoScaRa kick-off meeting (Stuttgart), EVEQ 2024 (Prague), Będlewo Fluids Conference, CoScaRa workshop Mannheim, INdAM conference Roma (online), Fall School GSSI (online), RMU Seminar SoCo PDEs Darmstadt, Singularities in Fluids and General Relativity (IMS Singapore).

2025: CoScaRa status meeting (Darmstadt).

Teaching

Teaching at the University of Basel

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

HS25: Sabbatical.

HS24-FS25: Analysis I & II (1st year Bachelor).

HS23-FS24: Introduction to Mathematical Fluid Dynamics I & II (Master).

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/`

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.

[J7] G.C., C. Jimenez & A. Pratelli: *Optimum and equilibrium in a transport problem with queue penalization effect.* Advances in Calculus of Variations **2** (2009), no. 3, 207–246.

[J8] L. Ambrosio, G.C., A. Figalli & L. V. Spinolo: *Some new well-posedness results for continuity and transport equations, and applications to the chromatography system.* SIAM J. Math. Anal. **41** (2009), no. 5, 1890–1920.

[J9] G.C.: *Lagrangian flows and the one-dimensional Peano phenomenon for ODEs.* Journal of Differential Equations **250** (2011), no. 7, 3135–3149.

[J10] E. Acerbi, G.C. & D. Mucci: *A variational problem for multifunctions with interaction between leaves.* ESAIM Control Optim. Calc. Var. **18** (2012), no. 4, 1178–1206.

[J11] G.C. & M. Lécureux-Mercier: *Existence and uniqueness of measure solutions for a system of continuity equations with non-local flow.* NoDEA Nonlinear Differential Equations Appl. **20** (2013), no. 3, 523–537.

[J12] F. Bouchut & G.C.: *Lagrangian flows for vector fields with gradient given by a singular integral.* J. Hyper. Differential Equations **10** (2013), no. 2, 235–282.

[J13] G. Alberti, S. Bianchini & G.C.: *Structure of level sets and Sard-type properties of Lipschitz maps: results and counterexamples.* Ann. Sc. Norm. Super. Pisa Cl. Sci. (5) **12** (2013), no. 4, 863–902.

[J14] G. Alberti, S. Bianchini & G.C.: *A uniqueness result for the continuity equation in two dimensions.* J. Eur. Math. Soc. (JEMS) **16** (2014), no. 2, 201–234.

[J15] G. Alberti, S. Bianchini & G.C.: *On the L^p differentiability of certain classes of functions.* Revista Matemática Iberoamericana **30** (2014), no. 1, 349–367.

[J16] G.C., C. Donadello & L. V. Spinolo: *Initial-boundary Value Problems for Continuity Equations with BV Coefficients.* Journal de Mathématiques Pures et Appliquées **102** (2014), no. 1, 79–98.

[J17] G.C., C. Donadello & L. V. Spinolo: *A note on the initial-boundary value problem for continuity equations with rough coefficients.* Hyperbolic Problems: Theory, Numerics, Applications. Proceedings of the International Conference on Hyperbolic Problems "HYP2012", held in Padova on June 24–29, 2012. Editors: Fabio Ancona, Alberto Bressan, Pierangelo Marcati, Andrea Marson. AIMS Book Series on Applied Mathematics **8** (2014), pp. 957–966.

[J18] G.C., N. Gusev, S. Spirito & E. Wiedemann: *Non-uniqueness and prescribed energy for the continuity equation.* Communications in Mathematical Sciences **13** (2015), no. 7, 1937–1947.

[J19] M. Colombo, G.C. & S. Spirito: *Renormalized solutions to the continuity equation with an integrable damping term.* Calculus of Variations and Partial Differential Equations **54** (2015), no. 2, 1831–1845.

[J20] G.C. & S. Spirito: *Renormalized Solutions of the 2D Euler Equations.* Communications in Mathematical Physics **339** (2015), no. 1, 191–198.

[J21] G.C., E. Semenova & S. Spirito: *Strong continuity for the 2D Euler equations.* Kinetic and Related Models **8** (2015), no. 4, 685–689.

[J22] G.C., M. Lopes Filho, E. Miot & H. Nussenzveig Lopes: *Flows of vector fields with point singularities and the vortex-wave system.* Discrete Contin. Dyn. Syst. - Series A (DCDS-A) **36** (2016), no. 5, 2405–2417.

[J23] A. Bohun, F. Bouchut & G.C.: *Lagrangian solutions to the 2D Euler system with L^1 vorticity and infinite energy.* Nonlinear Analysis: Theory, Methods & Applications **132** (2016), 160–172.

[J24] A. Bohun, F. Bouchut & G.C.: *Lagrangian solutions to the Vlasov-Poisson system with L^1 density.* J. Differential Equations **260** (2016), no. 4, 3576–3597.

[J25] M. Colombo, G.C. & S. Spirito: *Logarithmic estimates for continuity equations.* Networks and Heterogeneous Media **11** (2016), no. 2, 301–311. Special issue on contemporary topics in conservation laws.

[J26] A. Bohun, F. Bouchut & G.C.: *Lagrangian flows for vector fields with anisotropic regularity.* Annales de l'Institut Henri Poincaré (C) Analyse Non Linéaire **33** (2016), no. 6, 1409–1429.

[J27] L. Caravenna & G.C.: *Uniqueness and Lagrangianity for solutions with lack of integrability of the continuity equation.* C. R. Math. Acad. Sci. Paris, **354** (2016), no. 12, 1168–1173.

[J28] G.C., N. Gusev, S. Spirito & E. Wiedemann: *Failure of the chain rule for the divergence of bounded vector fields.* Ann. Sc. Norm. Super. Pisa Cl. Sci. (5) **17** (2017), no. 1, 1–18.

[J29] S. Bianchini, M. Colombo, G.C. & L. V. Spinolo: *Optimality of integrability estimates for advection-diffusion equations.* Nonlinear Differ. Equ. Appl. (NoDEA) **24** (2017), no. 4, Art. 33. Topical collection: Hyperbolic PDEs, Fluids, Transport and Applications: Dedicated to Alberto Bressan for his 60th birthday.

[J30] G.C. & C. Schulze: *Cellular mixing with bounded palenstrophy.* Mathematical Models and Methods in Applied Sciences (M3AS) **27** (2017), no. 12, 2297–2320.

[J31] G.C., C. Nobili, C. Seis & S. Spirito: *Eulerian and Lagrangian solutions to the continuity and Euler equations with L^1 vorticity.* SIAM J. Math. Anal. **49** (2017), no. 5, 3973–3998.

[J32] A. P. Choudhury, G.C. & L. V. Spinolo: *Initial-boundary value problems for nearly incompressible vector fields, and applications to the Keyfitz and Kranzer system.* Zeitschrift für angewandte Mathematik und Physik **68** (2017), no. 6, Art. 138.

[J33] G.C., S. Ligabue & C. Saffirio: *Lagrangian solutions to the Vlasov-Poisson system with a point charge.* Kinetic and Related Models **11** (2018), no. 6, 1277–1299.

[J34] G. Alberti, G.C. & A. L. Mazzucato: *Exponential self-similar mixing by incompressible flows.* J. Amer. Math. Soc. **32** (2019), no. 2, 445–490.

[J35] G.C., R. Lucà & C. Schulze: *Polynomial mixing under a certain stationary Euler flow.* Physica D: Nonlinear Phenomena **394** (2019), 44–55.

[J36] M. Colombo, G.C. & L. V. Spinolo: *On the singular local limit for conservation laws with nonlocal fluxes.* Arch. Ration. Mech. Anal. **233** (2019), no. 3, 1131–1167.

[J37] G. Alberti, G.C. & A. L. Mazzucato: *Loss of regularity for the continuity equation with non-Lipschitz velocity field.* Annals of PDE **5** (2019), no. 1, Art. 9.

[J38] G. Ciampa, G.C. & S. Spirito: *Smooth approximation is not a selection principle for the transport equation with rough vector field.* Calculus of Variations and Partial Differential Equations **59** (2020), no. 1, Art. 13.

[J39] G. Ciampa, G.C. & S. Spirito: *Weak solutions obtained by the vortex method for the 2D Euler equations are Lagrangian and conserve the energy.* Journal of Nonlinear Science **30** (2020), 2787–2820.

[J40] G. Ciampa, G.C. & S. Spirito: *Strong convergence of the vorticity for the 2D Euler equations in the inviscid limit.* Arch. Rational Mech. Anal. **240** (2021), 295–326.

[J41] L. Caravenna & G.C.: *A directional Lipschitz extension lemma, with applications to uniqueness and Lagrangianity for the continuity equation.* Comm. Partial Differential Equations **46** (2021), no. 8, 1488–1520.

[J42] M. Colombo, G.C., E. Marconi & L. V. Spinolo: *Local limit of nonlocal traffic models: convergence results and total variation blow-up.* Ann. Inst. H. Poincaré Anal. Non Linéaire **38** (2021), no. 5, 1653–1666.

[J43] M. Colombo, G.C., M. Graff & L. V. Spinolo: *On the role of numerical viscosity in the study of the local limit of nonlocal conservation laws.* ESAIM Math. Model. Numer. Anal. **55** (2021), no. 6, 2705–2723.

[J44] P. Bonicatto, G. Ciampa & G.C.: *On the advection-diffusion equation with rough coefficients: weak solutions and vanishing viscosity.* Journal de Mathématiques Pures et Appliquées **167** (2022), 204–224.

[J45] G.C., T. Elgindi, G. Iyer & A. L. Mazzucato: *Growth of Sobolev norms and loss of regularity in transport equations.* Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences **380** (2022), 2021024. Theme issue on "Mathematical problems in physical fluid dynamics (part 1)".

[J46] G.C. & C. Schulze: *Sub-exponential mixing of generalized cellular flows with bounded palenstrophy.* Mathematics in Engineering **5** (2023), no. 1, 1–12. Special Issue: Fluid instabilities, waves and non-equilibrium dynamics of interacting particles.

[J47] M. Colombo, G.C., E. Marconi & L. V. Spinolo: *Nonlocal traffic models with general kernels: singular limit, entropy admissibility, and convergence rate.* Arch. Ration. Mech. Anal. **247** (2023), Art. 18.

[J48] G.C. & S. Ligabue: *A note on the Lagrangian flow associated to a partially regular vector field.* Differ. Equ. Dyn. Syst. **31** (2023), no. 4, 767–786.

[J49] M. Colombo, G.C. & M. Sorella: *Anomalous dissipation and lack of selection in the Obukhov-Corrsin theory of scalar turbulence.* Ann. PDE **9** (2023), no. 2, Paper no. 21, 48 pp.

[J50] E. Bruè, M. Colombo, G.C., C. De Lellis & M. Sorella: *Onsager critical solutions of the forced Navier-Stokes equations.* Commun. Pure Appl. Anal. **23** (2024), no. 10, 1350–1366. Special issue in honor of Vladimír Šverák.

[J51] P. Bonicatto, G. Ciampa & G.C.: *Weak and parabolic solutions of advection-diffusion equations with rough velocity field.* J. Evol. Equ.**24** (2024), no. 1, Paper no. 1, 16 pp.

[J52] S. Abbate, G.C. & S. Spirito: *Strong convergence of the vorticity and conservation of the energy for the α-Euler equations.* Nonlinearity **37** (2024), no. 3, Paper no. 035012, 25 pp.

[J53] G.C. & G. Stefani: *An elementary proof of existence and uniqueness for the Euler flow in localized Yudovich spaces.* Calc. Var. Partial Differential Equations **63** (2024), Paper no. 168, 31 pp.

[J54] G. Ciampa, G.C. & S. Spirito: *Propagation of logarithmic regularity and inviscid limit for the 2D Euler equations.* Mathematics in Engineering **6** (2024), no. 4, 494–509. Special issue in honor of Pierangelo Marcati.

[J55] G.C., M. Inversi, C. Saffirio & G. Stefani: *Existence and stability of weak solutions of the Vlasov–Poisson system in localized Yudovich spaces.* Nonlinearity **7** (2024), no. 9, Paper no. 095015.

[J56] G. M. Coclite, M. Colombo, G.C., N. De Nitti, A. Keimer, E. Marconi, L. Pflug & L. V. Spinolo: *Oleĭnik-type estimates for nonlocal conservation laws and applications to the nonlocal-to-local limit.* Journal of Hyperbolic Differential Equations, special volume, in press.

[J57] P. Bonicatto, G. Ciampa & G.C.: *A regularity result for the Fokker-Planck equation with non-smooth drift and diffusion.* Nonlinear Analysis, in press.

[J58] M. Colombo, G.C. & L. V. Spinolo: *On multidimensional nonlocal conservation laws with BV kernels.* Indiana University Mathematical Journal, in press.

Reviews and Book Chapters (peer-reviewed)

[R1] L. Ambrosio & G.C.: *Existence, uniqueness, stability and differentiability properties of the flow associated to weakly differentiable vector fields.* In "Transport equations and multi-D hyperbolic conservation laws", 3–57, Lect. Notes Unione Mat. Ital., **5**, Springer, Berlin, 2008.

[R2] G.C., F. Otto & M. Westdickenberg: *Regularizing effect of nonlinearity in multidimensional scalar conservation laws.* In "Transport equations and multi-D hyperbolic conservation laws", 77–128, Lect. Notes Unione Mat. Ital., **5**, Springer, Berlin, 2008.

[R3] G.C. & L. V. Spinolo: *An overview on some results concerning the transport equation and its applications to conservation laws.* Communications on Pure and Applied Analysis **9** (2010), no. 5, 1283–1293.

[R4] L. Ambrosio & G.C.: *Continuity equations and ODE flows with non-smooth velocity.* Lecture Notes of a course given at Heriot-Watt University, Edinburgh. Proceedings of the Royal Society of Edinburgh: Section A Mathematics **144** (2014), n. 6, 1191–1244.

[R5] M. Coti Zelati, G.C., G. Iyer, A. L. Mazzucato: *Mixing in incompressible flows: transport, dissipation, and their interplay.* Notices Amer. Math. Soc. **71** (2024), no. 5, 593–604.

[R6] G.C. & S. Spirito: *Lagrangian solutions of the two-dimensional Euler equations.* Chapter in a book of the SEMA SIMAI Springer Series, in press.

Monographs (peer-reviewed)

[M1] G.C.: *The flow associated to weakly differentiable vector fields.* Theses of Scuola Normale Superiore di Pisa (New Series), **12**. Edizioni della Normale, Pisa, 2009 - Distributed by Birkhäuser.

Proceedings and Research Announcements (peer-reviewed)

[P1] G.C. & C. De Lellis: *Regularity and compactness for the DiPerna–Lions flow.* Hyperbolic Problems: Theory, Numerics, Applications. Proceedings of the International Conference on Hyperbolic Problems "HYP2006", held at the Ecole Normale Supérieure, Lyon, July 17–21, 2006. pp. 423–430. Edited by S. Benzoni-Gavage, D. Serre. Springer Verlag, 2008.

[P2] G.C.: *The ordinary differential equation with non-Lipschitz vector fields.* Boll. Unione Mat. Ital. (9) **1** (2008), no. 2, 333–348. Also in: Proceedings of the 18th Congress of Unione Matematica Italiana, Bari, 24-29 September 2007. UMIProceedings **3**, edited by Francesco Altomare.

[P3] F. Bouchut & G.C.: *Equations de transport à coefficient dont le gradient est donné par une intégrale singulière. (French) [Transport equations with a coefficient whose gradient is given by a singular integral].* Séminaire: Équations aux Dérivées Partielles. 2007–2008, Exp. No. I, 15 pp., Sémin. Équ. Dériv. Partielles, École Polytech., Palaiseau, 2009.

[P4] G.C., C. Jimenez & A. Pratelli: *A transport problem with queue penalization effect.* In "Singularities in nonlinear evolution phenomena and applications", 139–156, CRM Series **9**, Ed. Norm., Pisa, 2009. Edited by Matteo Novaga and Giandomenico Orlandi.

[P5] G. Alberti, S. Bianchini & G.C.: *Two-dimensional transport equation with Hamiltonian vector fields.* Hyperbolic Problems: Theory, Numerics and Applications. Proceedings of the International Conference on Hyperbolic Problems "HYP2008", held at the University of Maryland, College Park, June 9–13, 2008. Edited by E. Tadmor, J.-G. Liu, and A. Tzavaras. Proceedings of Symposia in Applied Mathematics **67**, pp. 337–346. American Mathematical Society, Providence, 2009.

[P6] G. Alberti, S. Bianchini & G.C.: *Divergence-free vector fields in* $\mathbf{R}^2$. Proceedings of the Fifth International Conference on Differential and Functional Differential Equations. Journal of Mathematical Sciences **170** (2010), no. 3, 283–293. Russian Version: in Sovrem. Mat. Fundam. Napravl. **35** (2010), 22–32.

[P7] L. Ambrosio, G.C., A. Figalli & L. V. Spinolo: *Existence and uniqueness results for the continuity equation and applications to the chromatography system.* In "Nonlinear Conservation Laws and Applications", IMA Vol. Math. Appl. **153** (2011), pp. 195–204. Edited by A. Bressan, G.-Q. Chen, M. Lewicka, and D. Wang.

[P8] G.C.: *Ordinary differential equations and singular integrals.* Hyperbolic Problems: Theory, Numerics, Applications. Proceedings of the International Conference on Hyperbolic Problems "HYP2012", held in Padova on June 24–29, 2012. Edited by F. Ancona, A. Bressan, P. Marcati, and A. Marson. AIMS Book Series on Applied Mathematics **8** (2014), pp. 109–117.

[P9] G. Alberti, G.C. & A. L. Mazzucato: *Exponential self-similar mixing and loss of regularity for continuity equations.* C. R. Math. Acad. Sci. Paris **352** (2014), no. 11, 901–906.

[P10] G.C.: *The nonlocal-to-local limit for conservation laws.* Oberwolfach report no. 30/2016 "Hyperbolic Techniques in Modelling, Analysis and Numerics", 2016.

[P11] G.C.: *Uniqueness and Lagrangianity for solutions with lack of integrability of the continuity equation.* Oberwolfach report no. 24/2019 "Nonlinear Hyperbolic Problems: Modelling, Analysis, and Numerics", 2019.

[P12] G. Ciampa, G.C. & S. Spirito: *On smooth approximations of rough vector fields and the selection of flows.* Hyperbolic Problems: Theory, Numerics, Applications. Proceedings of the International Conference on Hyperbolic Problems "HYP2018", held at the Pennsylvania State University, University Park, June 25–29, 2018. Edited by A. Bressan, M. Lewicka, D. Wang, and Y. Zheng. AIMS Book Series in Applied Mathematics **10** (2020), pp. 361–368.

[P13] M. Colombo, G.C., M. Graff & L. V. Spinolo: *Recent results on the singular local limit for nonlocal conservation laws.* Hyperbolic Problems: Theory, Numerics, Applications. Proceedings of the International Conference on Hyperbolic Problems "HYP2018", held at the Pennsylvania State University, University Park, June 25–29, 2018. Edited by A. Bressan, M. Lewicka, D. Wang, and Y. Zheng. AIMS Book Series in Applied Mathematics **10** (2020), pp. 369–376.

[P14] M. Colombo, G.C., E. Marconi & L. V. Spinolo: *An overview on the local limit of non-local conservation laws, and a new proof of a compactness estimate.* Journées Équations aux dérivées partielles (2023), Exposé n. XI.

Edited Volumes and Issues (peer-reviewed)

[E1] *Proceedings of the Seventh Meeting on Hyperbolic Conservation Laws and Fluid Dynamics: Recent Results and Research Perspectives.* SISSA Trieste (Italy), August 31 – September 4, 2009. Edited by Fabio Ancona, Stefano Bianchini, Rinaldo M. Colombo, Gianluca Crippa and Andrea Marson. Rivista di Matematica della Università di Parma, vol. 1 no. 1, new series, 2010.

[E2] *Proceedings of the Intensive Research Month on Hyperbolic Conservation Laws and Fluid Dynamics.* Parma (Italy), February 1 – 28, 2010. Edited by Emilio Acerbi, Claudio Arezzo, Gianluca Crippa, Camillo De Lellis and Giuseppe Mingione. Rivista di Matematica della Università di Parma, vol. 3 no. 1, new series, 2012.

[E3] *HCDTE Lecture Notes. Part I. Nonlinear Hyperbolic PDEs, Dispersive and Transport Equations.* Edited by Giovanni Alberti, Fabio Ancona, Stefano Bianchini, Gianluca Crippa, Camillo De Lellis, Andrea Marson, Corrado Mascia. AIMS Book Series on Applied Mathematics (Volume 6). Lectures notes originating from the Intensive Trimester *Nonlinear Hyperbolic PDEs, Dispersive and Transport Equations: Analysis and Control*, held at SISSA, Trieste, May 16 – July 22, 2011.

[E4] *HCDTE Lecture Notes. Part II. Nonlinear Hyperbolic PDEs, Dispersive and Transport Equations.* Edited by Giovanni Alberti, Fabio Ancona, Stefano Bianchini, Gianluca Crippa, Camillo De Lellis, Andrea Marson, Corrado Mascia. AIMS Book Series on Applied Mathematics (Volume 7). Lectures notes originating from the Intensive Trimester *Nonlinear Hyperbolic PDEs, Dispersive and Transport Equations: Analysis and Control*, held at SISSA, Trieste, May 16 – July 22, 2011.

[E5] *Transport, Fluids, and Mixing*. Edited by Gianluca Crippa and Anna L. Mazzucato. De Gruyter Open, Book Series on Partial Differential Equations and Measure Theory, 2017.

Preprints (submitted for publication)

[S1] G.C., L. De Rosa, M. Inversi & M. Nesi: *Normal traces and applications to continuity equations on bounded domains.*

[S2] S. Abbate, L. C. Berselli, G.C. & S. Spirito: *Convergence of the Euler-Voigt equations to the Euler equations in two dimensions.*