

CURRICULUM VITÆ ET STUDIORUM

di LUIGI CARLO BERSELLI

Studi

Novembre 1991-Ottobre 1995, alunno del corso ordinario presso la classe di SCIENZE della **Scuola Normale Superiore** di Pisa, superando tutti gli esami prescritti dall'ordinamento degli studi.

Gennaio 1994, studente visitatore presso **École Normale Supérieure** di Parigi.

13 luglio 1995, laurea in **Matematica**, indirizzo generale, con la votazione di **110/110 cum laude**, presso l'Università di Pisa, con la tesi di analisi matematica: "L'esistenza globale per le soluzioni delle equazioni di moto dei fluidi ideali", relatore il Prof. Hugo Beirão da Veiga e controrelatore il Prof. Sergio Spagnolo. Tale tesi è risultata vincitrice del premio 1997 dell'Accademia Olimpica di Vicenza.

Novembre 1995–Ottobre 1999 studente della Scuola di Dottorato del Dipartimento di Matematica "L. Tonelli" di Pisa (XI ciclo).

11 luglio, 1997, diploma in **Matematica** della **Scuola Normale Superiore** di Pisa, con la votazione di **70/70 cum laude**, discutendo anche risultati originali sull'argomento: "Metodi numerici per l'approssimazione delle equazioni della fisica matematica".

28 febbraio 2000 conseguimento del titolo di **Dottore di ricerca in Matematica**, con la tesi dal titolo: "Some topics in fluid mechanics" tutori i Proff. Hugo Beirão da Veiga e Alberto Valli.

Posizioni Ricoperte

Dicembre 2015-oggi, **Professore Ordinario di Analisi Matematica (MATH-03/A)**, Università di Pisa.

Ottobtr 2006-Novembre 2015, **Professore Associato di Analisi Matematica**, Università di Pisa.

Marzo 2000-Settembre 2006, **Ricercatore di Analisi Matematica**, Università di Pisa.

November 1999–February 2000, **Post-doc** nel progetto: "*Modelli matematici nell'ingegneria e nell'industria: aspetti teorici e computazionali*," Università di Pisa.

Affiliazioni Professionali

- American Mathematical Society (AMS)
- Istituto Nazionale di Alta Matematica (INdAM/GNAMPA)

Interessi di ricerca

- Equazioni di Navier-Stokes equations, regolarità di soluzioni deboli.
- Aspetti teorici dei metodi analitici di Large Eddy Simulation per flussi turbolenti.
- Applicazioni dell'analisi Matematica a flussi biologici e geofisici.
- Metodi numerici per modelli di grande scala.
- Fluidi Non-Newtoniani.

Indicatori bibliometrici

- Scopus: Documents: 104; citations: 1405; h-index: 19, SC: 6602770666
- Web of Science: Documents: 118; citations: 1671, h-index: 21 I-4763-2012
- Mathematical Reviews: Documents: 113, citations: 1460, h-index: 18, MR636037
- zbMATH: Documents: 117, citations: 1358, h-index: 17, berselli.luigi-carlo
- Google Scholar: Documents: 120, citations: 2936, h-index: 26; Profile
- ORCID: 0000-0001-6208-9934I

Partecipazione e coordinamento di gruppi nazionali di ricerca

- PRIN 2000, Theory and applications of linear and nonlinear hyperbolic equations, national coordinator S. Spagnolo.
- PRIN 2002, Hyperbolic and parabolic nonlinear equations, national coordinator P. Marcati.
- PRIN 2005, Fluid dynamics and conservation laws, national coordinator P. Secchi.
- PRIN 2007, Nonlinear systems of conservation laws and fluid mechanics, national coordinator S. Bianchini.
- PRIN 2009, Systems of conservation laws and fluid mechanics: method and applications, national coordinator S. Bianchini.

- PRIN 2012, Nonlinear hyperbolic partial differential equations, dispersive and transport equations: theoretical and applicative aspects, national coordinator S. Bianchini.
- PRIN 2016 Hyperbolic systems of conservation laws and fluid dynamics: analysis and applications, national coordinator S. Bianchini.
- PRIN 2020 Nonlinear evolution PDEs, fluid dynamics and transport equations: theoretical foundations and applications, coordinator of the unit in Pisa.
- GNAMPA 2007, Random and computational models for the analysis of turbulence generated by rough walls, national coordinator M. Romito
- GNAMPA 2011, Continuous and discrete statistical models for the study of the transport of the kinetic energy in ideal fluids, national coordinator.
- GNAMPA 2012, Analysis of trajectories of solutions of stochastic partial differential equations, national coordinator M. Romito.
- GNAMPA 2017, Stability, continuation and turbulence in evolution problems, national coordinator.
- GNAMPA 2023, Analytical and numerical studies for systems of partial differential equations, coordinator A. Abbatiello.
- PRA_2016.6 UNIP: Evolution problems: qualitative analysis and asymptotic behavior, coordinator N. Visciglia.
- PRA_2018.52 UNIP: Energy and regularity: New techniques for classical PDE problems, coordinator E. Chiodaroli.

Attività Editoriale

Editor

- Advances in Mathematical Physics, Hindawi [2008-present]
- Guest editor for the special volume *Fluid Dynamics and Electromagnetism: "Theory and Numerical Approximation"* of the journal Discrete Contin. Dynam. Systems Series S. **9** 2016
doi:10.3934/dcdss.2016.9.1i
- Boundary Value Problems, Springer [2016-present]
- Advances in Nonlinear Analysis, De Gruyter [2019-2025]
- Co-Editor of the volume *Progress in Fluid Mechanics*, Lecture Notes in Mathematics 2272, 2020, ISBN 978-3-030-54898-8 doi:10.1007/978-3-030-54899-5
- Zeitschrift für angewandte Mathematik und Physik (ZAMP), Birkhäuser [2022-present]
- Differential and integral equations [2025-]

Revisore

- Revisore di circa 250 lavori per riviste internazionali di matematica, ottenendo anche il certificato di eccellenza dalla Elsevier nel 2014.
- Revisore per il Mathematical Reviews (2002-oggi, con più di 200 review).

Altre attività

Servizi Amministrativi

Membro eletto della commissione di area [2002-2004], [2014-2018].

Membro della giunta di dottorato in Matematica, Università di Pisa. [Novembre 2006-Gennaio 2012], [Marzo, 2023-oggi]

Membro eletto del comitato di Presidenza della Facoltà di Ingegneria, Università di Pisa. [Luglio 2009-Settembre 2012.]

Referente di Dipartimento per la ricerca. [Maggio 2017-oggi]

Membro del comitato scientifico della Fondazione CIME (Firenze) [Gen. 1, 2020-present]

Membro del collegio di dottorato in “High Performance Scientific Computing”, Pisa [Maggio 2025-oggi]

Referente italiano per il progetto DFG “International Research Training Group 3132 - Analysis of Nonlinear PDE” [Ottobre 2025-oggi]

Valutatore per altri enti

- U.S. Universities (2006)
- U.K. Universities (2014)
- MIUR (FIRB 2013) and (SIR 2015)
- (ANEP)-Agencia Nacional de Evaluación y Prospectiva, Spain (2015)
- National Science Centre Poland (2019)
- ERC (2020)
- The Czech Science Foundation-GACR (2020)

Organizzazione di conferenze

- Co-organizzatore del the workshop: “Partial Differential equations, fluid mechanics and conservation laws,” Pisa, Novembre 28-30, 2007.
- Organizzatore del mini-symposium: “Navier-Stokes equations and LES models”, Conferenza MFD2010 (Mathematical fluid dynamics and its applications) Rennes (France, June 21–24, 2010).
- Co-organizzatore del workshop: “Fluid Dynamics and Electromagnetism: Theory and Numerical Approximation,” CIRM-FBK, Levico Terme, June 3-6, 2014.

- Co-organizzatore del workshop: “New trends in Partial Differential Equations”, Centro De Giorgi, Pisa, October 3–7, 2016.
- Co-organizzatore del workshop: “Recent Progresses in PDEs” Dep. Mathematics, University of Pisa, January, 19-20th, 2017.
- Co-organizzatore del workshop: “Equazioni alle Derivate Parziali nella Dinamica dei Fluidi” Centro De Giorgi, Pisa, February, 5–7th, 2018.
- Co-organizzatore del workshop: “Variational problems, PDEs and applications”, Dept. Mathematics, University of Pisa, January, 17-19th, 2019.
- Co-organizzatore della scuola estiva CIME: “Progress in Mathematical Fluid Dynamics” Cetraro (CS), June 17–21th, 2019.
- Co-organizzatore del workshop: “Variational problems, PDEs and applications”, Dep. Mathematics, University of Pisa, January, 17-18th, 2020.
- Co-organizzatore del workshop: “Analysis of nonlinear, PDEs”, Dep. Mathematics, University of Pisa, June, 6-7th, 2024.

Membro della commissione di ingresso Ph.D. in Matematica Applicata e per l’industria, 2002, 2003, 2008, & 2009, Scuola Normale Superiore, Pisa.

Membro della commissione di ingresso Ph.D. in ingegneria industriale 2009 & 2011, Univ. di Pisa.

Membro della commissione per contratti di ricerca in Analisi Matematica 2002 & 2007, Univ. di Pisa.

Membro della commissione di ingresso Classe di Science, corso ordinario, 2025m Scuola Normale Superiore, Pisa.

Membro di Commissioni di Concorso for: a) Assegno di ricerca in analisi Matematica, 2002, 2007, 2022, 2023, & 2024 (Univ. Pisa); b) Ricercatore in Analisi Matematica, 2016 & 2021 (Univ. Pisa); c) Professore in Probabilità 2017 (Univ. Pisa); d) RTDB/RTT in Analisi Matematica, 2017 (GSSI, L’Aquila), 2018 (Univ. of Pisa), 2024 (GSSI, L’Aquila); c) Professore in Analisi Matematica 2023 (Univ. Brescia)

Membro della giuria per esame finale di Dottorato o Ph.D.

- Enrica Salvatici, Dottorato in Ingegneria Aerospaziale, Pisa, 2005.
- Luis Borges, Ph.D. in Matematica, Instituto Superior Técnico, Lisbon, 2006.
- Jmmy Alfonso Mauro, Dottorato in Matematica, Pisa, 2010.
- Angel Castro Martínez, Ph.D. in Matematica, Universidade Autónoma de Madrid, 2010
- Hani Ali, Ph.D. in Matematica, University Rennes 1, Rennes (France), 2011, referee.
- Monica Twarogowska, Dottorato in Matematica, L’Aquila 2012.
- M. Ahmed Rejaiba, Ph.D. in Matematica, University of Pau et des Pays de l’Adour (France) 2014.
- Elena Di Iorio, Ph.D. in Mathematics, SISSA (Trieste) and GSSI (L’Aquila), October 2018.
- Giada Cianfarani Carnevale, Ph.D. in Mathematics, University of L’Aquila, July 2022.

Studenti di Dottorato

- Stefano Spirito, “The artificial compressibility approximation and the inviscid limit for the incompressible Navier-Stokes equations,” PhD from the University of L’Aquila, Febbaio 2012. (Ora Professore associato alla Univ. dell’Aquila)
- Matteo Cerminara, “Modeling dispersed gas-particle turbulence in volcanic ash plumes,” PhD from the Scuola Normale Superiore (Pisa), Luglio 2016. (Ora ricercatore a tempo indeterminato all INGV, National Institute of Geophysics and Volcanology).
- Dinh Duong Nguyen, “Some results about turbulent models,” PhD. from Rennes Univ. 1 (France), Ottobre 2020. (Currently research associate at Vietnam Institute for Advanced Study in Mathematics (VIASM), Hanoi, Vietnam)

Tesi Triennali

- Matteo Ballero, Introduction to the wavelet transform (2016)
- Eric Stenhede, Curves with constant width described by Fourier Series (2017)
- Ginvevra Biondi, Sobolev integral formula and applications (2017)
- Martino Fortuna, The Schwarz alternating method (2017)
- Matteo Aldovardi, On the implicit function theorem (2018)
- Sean Berti, On the Polya function (2018)
- Marco Miani, From the Calderón problem to the Harry Potter’s cloak (2018)

Tesi Magistrali

- Arturo Battinelli, Analisi di un modello probabilistico per un fluido viscoso in un canale con pareti ruvide” Università di Firenze (2008), LM voto 110/110 *cum laude* (co-advisor with M. Romito)
- Alice Borselli, Esistenza e unicità di soluzione ultra-deboli per il sistema di Stokes, Università di Pisa Pisa (2009), LM voto 110/110 (co-advisor with M. Romito).
- Michele Erba, Modelli matematici per il flusso lungo un profilo collinare e applicazioni per la collocazione di fattorie eoliche, Università di Pisa (2010), LM voto 107/110 (co-advisor with Dr. Eng. P. di Marco).
- Nicolas Orsini, Equations de Navier-Stokes et modélisation de la turbulence (2019), Stage ENS Cachan.
- Nicola Mazur, Evolution problems: a non Archimedean approach (Non standard analysis and PDEs) (2025), voto 110/110 *cum laude* (co-relatore con V. Benci).

Post doc mentoring

- Luca Bisconti, Università di Firenze, 2009-2011 (Ora Prof. Associato Università di Firenze)
- Rossano Sannipoli, Università di Pisa, Giugno 2023-Maggio 2024. (Ora post-doc a Padova).
- Alex Kaltenbach, Dept. of Math, TU Berlin, June 2023-March 2024 (Ora post-doc alla TU Berlin).

Corsi insegnati

- Esercitazioni di **Matematica I** (Calcolo I), 1999-2000 Università di Trento; 2000-2001, 2001-2002, 2002-2003, and 2003-2004, Università di Pisa, Facoltà di Ingegneria.
- Esercitazioni di **Analisi Matematica III** (serie e trasformate di Fourier, stabilità per sistemi di equazioni differenziali ordinarie, funzioni di una variabile complessa), 2000-2001 Università di Pisa, Facoltà di Ingegneria.
- **Precorsi di matematica** (pre-calcolo), 2002-2003, 2003-2004, 2005-2006 e 2007-2008 Università di Pisa.
- Affidatario e poi titolare del corso di **Matematica** (Calcolo I e Algebra Lineare), 2004-2005, 2005-2006, 2006-2007 e 2007-2008 Università di Pisa, Facoltà di Ingegneria.
- **Introduzione alla teoria degli automi**, Percorso di Eccellenza 2005-2006 Università di Pisa, Facoltà di Ingegneria.
- **Analisi Matematica I**, 2008–oggi Università di Pisa, Facoltà di Ingegneria.
- **Teoria dei semigrupperi**, 2012-2013, Università di Pisa, Matematica .
- **Analisi in più variabili 2** (analisi III) 2014-2018, 2025- Università di Pisa, Matematica.
- **Equazioni della fluidodinamica**, 2020–22, 2023-25 Univ. di Pisa, Matematica

Corsi di Dottorato o master

- **Metodi di Decomposizione di Dominio per EDP**, Perfezionamento di Matematica Applicata e per l'industria, 2001-2002 Scuola Normale Superiore, Pisa.
- Corso di lettura sulle **equazioni di Navier-Stokes**, 2002-2003 Università di Pisa. Univ. di Pisa.
- **Introduction to the LES of turbulent flows** for MS. students, 2005-2006, IST (Instituto Superior Técnico) Lisbon.
- **An introduction to the mathematics of Large Eddy Simulation of turbulent flows** SIMU-MAT summer school 2008, CIEM (International Center of Mathematical meetings), Castro Urdiales, Cantabria, Spain, July 7-18, 2008.
- **Introduzione alle EDP** per studenti di dottorato in Ingegneria, '08-'09 Università di Pisa
- **Introduction to mathematics of Large Eddy Simulation of turbulent flows**, Ph.D. program in industrial mathematics 2008-2011, Scuola Normale Superiore, Pisa.
- **On the Stokes Problem with Navier Boundary Conditions**, September 2009, SISSA/ISAS (International School for Advanced Studies), Trieste.
- **Some Selected Topics in Incompressible Fluid Mechanics** Summer School 2011 (Analytic Methods in PDEs), Department of Mathematics, University of Surrey, UK, September 12-16, 2011
- **Mathematical fluid dynamics**, Master-PhD class, KAUST, Saudi Arabia, Jan-May, 2023,

Soggiorni di studio e ricerca all'estero

- i) Pittsburgh University, Department of Mechanical Engineering, September 26–October 3, 2000, Pittsburgh (PA, U.S.)
- ii) Pittsburgh University, Department of Mechanical Engineering and Department of Mathematics, March 23–April 12, 2001, Pittsburgh (PA, U.S.)
- iii) Instituto Superior Técnico, Departamento de Matemática, April 16–25, 2002, Lisbon, (Portugal).
- iv) Pittsburgh University, Department of Mechanical Engineering and Department of Mathematics, February 1–28, 2003, Pittsburgh (PA, U.S.)
- vi) Otto-von-Guericke-Universität, Institut für Analysis and Numerik, May 8–15, 2004, Magdeburg (Germany).
- vii) Albert-Ludwigs Universität, Abteilung für Angewandte Mathematik, May 9–28 and August 20–September 13, 2005, Freiburg (Germany)
- viii) Universidade de Lisboa, Centro de Matemática e Aplicações Fundamentais and Instituto Superior Técnico, March 20–April 7, 2006, Lisboa (Portugal).
- vii) Albert-Ludwigs Universität, Abteilung für Angewandte Mathematik, March 3–15, 2008, Freiburg (Germany).
- viii) Virginia Tech, Department of Mathematics, March 29–April 3, 2009, Blacksburg (VA, U.S.).
- ix) American Institute of Mathematics, Palo Alto (CA, U.S.) April 6–10, 2009
- x) University Rennes 1, UFR Mathématiques, May 18–29, 2009, Rennes (France).
- xi) Instituto de Ciencia Matemáticas, Nov 21–27, 2010, Madrid (Spain).
- xii) Albert-Ludwigs Universität, Abteilung für Angewandte Mathematik, March 15–26, 2013, Freiburg (Germany).
- xiii) Albert-Ludwigs Universität, Abteilung für Angewandte Mathematik, Erasmus professor July 1–5, 2018, Freiburg (Germany).
- xiv) Computer, Electrical and Mathematical Sci. and Eng. Dept., King Abdullah University of Science and Technology KAUST, visiting professor, Jan–May, 2023, Thuwal (Saudi Arabia).

Conferenze su invito

1995

- Conference *Equadiff95* (Dep. de Matemática, Faculdade de Ciências, Lisbon, July 24–29, 1995). Talk: “On the breakdown of the smooth solutions to the Euler equations.”

1997

- Conference *Modeling of smart materials and optimal shape design* (Pisa, Dip. di Matematica “L. Tonelli,” April 17–18, 1997). Talk: “On electro-viscous fluids.”

1998

- Conference *Delft meeting on functional analysis and nonlinear partial differential equations* (Delft, Technical University TUDelft, The Netherlands, May 23–28, 1998). Talk: “A remark on 3-D Navier-Stokes equations.”
- Conference *Deterministic and stochastic fluid mechanics* (Torino, Dept. of Math., September 10–11, 1998). Talk on: “Some results on the long-time behavior of Navier-Stokes equations.”

1999

- Conference *IPERRoma99* (Roma, C.N.R.-National Research Council, October 25–27, 1999). Talk: “2D quasi-geostrophic equation, 3D Euler equations and related questions.”

2001

- Dip. di Matematica, Università di Milano, *Applied Math Seminar* (February 2001), Talk: “New results regarding the Navier-Stokes equations”
- Dept. of Mech. Eng., Pittsburgh University, U.S.A. (February 2001), a couple of 1 hour-seminars on: “Mathematical modeling of turbulent flows.”
- Dept. of Math., Pittsburgh University U.S.A., *Applied Math Seminar* (March 2001), Talk: “Numerical methods for advection-diffusion equations.”
- Conference *Contemporary Challenges in Applied Fluid Mechanics*, (Capo Miseno, May 31–June 5, 2001). Talk: “On the existence of strong solutions for a Large Eddy Simulation model.”
- Dept. of Aerospace Eng., Università di Pisa (July 2001), Talk: “Problems and methods in Large Eddy Simulation.”
- Conference *Nonlinear hyperbolic equations, their applications to hydrodynamics, dynamical systems*, (Torino, October 1–4, 2001). Talk: “The role of the vorticity field for incompressible flows.”

2002

- Dept. of Pure and Appl. Math., Università di L’Aquila (March 2002), Talk: “Analytical and geometric results for the Navier-Stokes equations.”
- *Workshop on Hyperbolic Equations*, (Venezia, April 11–12, 2002). Talk: “On the Euler equations and the motion of a vortex filament.”
- Conference *AMIF 2002-Applied Math for Industrial Flows, Third International Conference (April 17-20, 2002 Lisbon-Portugal)*. Talk: “Some Analytical results regarding the Rational Large Eddy Simulation model.”
- Dep. de Matemática, Instituto Superior Técnico, *Seminar on Applied Math and Numerical Analysis* (April 2002), Talk: “On the filtration through porous media: G-convergence and domain decomposition methods.”
- Conference *Advances on Nonlinear PDEs*, (June 5-8, 2002 L’Aquila). Talk: “Space filtered Navier-Stokes equations for turbulent flows: mathematical modeling and analytical results.”
- Dept. of Math. MOX-Politecnico di Milano (June 2002), Talk: “On the evolution of the vorticity in turbulent flows and small scale structures”

2003

- Dept. of Math, Pittsburgh University U.S.A., *Applied Math- Seminar* (February 2003), Talk: “Domain decomposition methods for the coupling of the Stokes equations and the porous media equations”

- Dept. of Math, Pittsburgh University U.S.A., Weekly Colloquium (February 2003), “New results and open problems in the mathematical theory of viscous incompressible flows.” Colloquium.
- Dept. of Math, Pittsburgh University U.S.A., Computational Math Seminar (February’s 2003), Talk: “On the slip with linear friction boundary conditions for the Navier-Stokes equations.”
- Dept. of Mechanical Engineering, Pittsburgh University U.S.A., FFF Fluid Mechanics Seminar (February 2003), Talk: “Some results for the Rational Large Eddy Simulation Model”
- Dept. of Math, Virginia Polytechnic Institute and State University (February 2003), Talk: “On the vorticity seeding method: control and generation of vorticity on the boundary.” Colloquium.
- Dept. of Mech. Eng., Pittsburgh University U.S.A., (February 2003), Talk: “Formation and evolution of coherent small dimensional patterns in incompressible fluids.”
- Dip di Matematica “L.Tonelli,” Università degli Studi di Pisa (March 2003), Talk: “Open problems for the Navier-Stokes equations”
- Conference *International Workshop on Nonlinear Partial Differential Equations. Celebration of the 60th birthday of Hugo Beirão da Veiga* (Funchal, Portugal, June 25–28, 2003). Talk: “On Taylor–Green vortices.” Main Speaker.
- Conference *Workshop on Navier-Stokes equations. Celebration of the 70th birthday of Vsevolod A. Solonnikov* (Paderborn, Germany July 18, 2003). Talk: “On the space-time regularity of the $C(0, T; L^3)$ mild solutions to the Navier-Stokes equations.”

2004

- Dept. of Math., Università di Ferrara (January 2004), 1 hour seminar on: “On the motion of an incompressible fluid equipped with non-standard boundary conditions.”
- Dept. of Math., Magdeburg (Germany, May 2004), Talk: “On the unsteady Navier-Stokes equations under Navier type boundary conditions.”
- Dept. of Math., Università di Brescia (May 2004). Talk: “New results on the motion of a line vortex.”
- Conference “*P.D.E. in Mathematical Physics*”, in memory of Olga A. Ladyzhenskaya (Levico T. ITALY, Oct. 24-30, 2004). Talk: “On commutation errors in the space filtered Navier-Stokes equations”. Main Speaker.

2005

- Dept. of Math., Freiburg University (Germany, May 2005). Talk: “Introduction to commutation errors in LES.” Colloquium.
- Dept. of Appl. Math., Freiburg University (Germany, May 2005) three-lectures on: “Introduction and perspectives in filtering for nonlinear equations”.
- School on Mathematical Theory in Fluid Mechanics, Paseky (Czech Republic, June 25–July 1, 2005), Short communication: “On very-weak solutions to the Navier-Stokes equations”.

2006

- CMAF, Lisbon University (March 2006): “On the global evolution of vortex filaments, blobs, and small loops in 3D ideal flows.
- Dep. de Matematica, University of Évora (Portugal) (April 2006) Talk: “On the regularity of solutions to the 3D Navier-Stokes equations.”

- *Workshop Mathematical analysis on fluid mechanics.* Dept. of Math., Universidad Autónoma de Madrid (October 2006): Talk: “Small structures in 3d ideal flows.”

2007

- *Meeting on honor of V.A. Solonnikov*, Pisa, (March 28-29, 2007) Talk: “Optimal estimates of Euler schemes for shear-dependent flows.”
- *International Conference in Mathematical Fluid Mechanics*, Estoril (Portugal, May 21–25, 2007) Talk: “Statistical Theories of p -fluids.” Main Speaker.
- *Joint Meeting DMV/UMI*, Perugia, (June 18–25, 2007.) Talk: “On the Boundary Commutation Error Term in the Numerical Simulation of Turbulent Flows.”
- *ICIAM07* Zurich, (Switzerland July 16–20, 2007) Talk: “Recent advances in the discretization of flows with shear dependent viscosities.”
- Meeting on conservation laws and continuum mechanics Pisa, (November 28–30, 2007) Talk: “On the geometry of solutions of the Navier-Stokes equations.”

2008

- Dep. de Matematicas, IMAFF - CSIC, Madrid (Spain, April 2008) Talk: On the existence of strong solutions for fluids with shear dependent viscosities.
- Dip. of Matematica “L.Tonelli,” Università degli Studi di Pisa (March 2008), Talk: “Navier-Stokes equations and regularity.”
- Conference *Vorticity, Rotation and Symmetry Stabilizing and Destabilizing Fluid Motion*, CIRM Luminy (France, May 19–23, 2008) Talk: vorticity and regularity for the Navier-Stokes equations. Main speaker.
- Conference *Navier-Stokes equations. Classical and generalized models* (Centro De Giorgi, Pisa, September 21–28 2008.) Talk: Some geometric constraints and the problem of global regularity for the Navier-Stokes equations.

2009

- Conference, *Journées SCASEN : Méthodes mathématiques en mécanique des fluides* (Université Lyon 1, Lyon France, January 20-22 2009.) Talk: “Lower bounds for the Navier-Stokes equations.” Main speaker.
- Dept. of Math, Virginia Polytechnic Institute and State University (April 2009), Talk: “On the existence of weak, strong and very-weak solutions. From the Poisson problem to the Stokes equations.” Colloquium.
- Conference, *2009 AMS Spring Southeastern Section Meeting Raleigh* (NC, April 4-5, 2009) Talk: “Analysis of an anisotropic scale similarity LES model.”
- University Rennes 1, UFR Mathématiques (May 2009) Talk: “On time dependent solution of the Navier-Stokes equations in pipes and applications to one of Leray’s problems.”
- Conference, *SIAM conference on Mathematical & Computational Issues in the Geosciences, Leipzig* (June 15-18, 2009), Talk: “Analysis of a scale similarity LES model designed for certain stratified flows.”
- Conference, *Mathematical Physics and PDEs* - (Levico, Sept. 6-11, 2009) Talk: “Convergence of approximate deconvolution models to the filtered Navier-Stokes Equations.” Main speaker.

- Conference, *QLES2009, Quality and Reliability of Large-Eddy Simulations II*. (Pisa, Sept. 9-11, 2009) Talk “On the analysis of some LES models based on approximate deconvolution and scale similarity.”
- Workshop, *LES in Italy*. (Pisa, Sept 12, 2009) Talk: “LES for the Boussinesq equations.”
- Dept. of Applied Math. “G. Sansone”, Univ. of Firenze, (Nov. 26, 2009) Talk: “On the Space filtered Navier-Stokes equations.”

2010

- Workshop *Hyperbolic Conservation Laws and Fluid Dynamics* (Parma, Feb. 15–19, 2010) Talk: “On the inviscid limit for the Navier-Stokes equations with slip boundary conditions.” (Main speaker)
- Conference MDF2010 (Rennes, France June 21–24, 2010) Talk: “On the vanishing viscosity limit for the 3D Navier-Stokes equations under slip boundary conditions in general domains” (Main speaker)
- International Summer School on Mathematical Fluid Dynamics (Levico, June 27-July 2, 2010) Talk: “On almost periodic flow in pipes” (Short communication)
- Conference PDEFM2010 (Warwick, UK, July 4–9, 2010) Talk: “On the vanishing viscosity limit for the 3D Navier-Stokes equations in bounded domains” (Main speaker).
- Centre for Nonlinear PDE, Oxford University, (Oct. 2010) Talk: “On averaged equations for turbulent flows.”
- Calculus of Variations, Singular Integrals and Incompressible flows, Instituto de Ciencias Matemática (Madrid, Spain, Nov. 2010) Talk: “Fully developed flows in pipes and applications.” (Main Speaker).

2011

- Dept. of Math. Univ. of L’Aquila, (Mar. 24, 2011) Talk: “Approximate deconvolution and related models for the Navier-Stokes equations.”
- Dept. of Math., Freiburg University (Germany, May 18, 2011). Talk: “On averaged equations for turbulent flows, with applications to Magnetohydrodynamics,” SFB Colloquium.
- Universitat Politècnica de Catalunya. Barcelona (Spain, June 9, 2011). Talk: “On the Boussinesq equation.”
- Nonlinear Hyperbolic PDEs, Dispersive and Transport Equations, SISSA/ISAS (July 13, 2011). Talk: “Some results on the Boussinesq equations.”
- Conference PDE in Mathematical Physics and their Numerical Approximation (Levico, Sept. 4-9, 2011). Talk: “Optimal error estimates for fluid with shear-dependent viscosities.”

2012

- Connections Between Regularized and Large-Eddy Simulation Methods for Turbulence, (Banff, Canada, May 13–18, 2012). Talk: “LES and volcanic eruptions.”
- Dept. of Math., Univ of Warwick (UK, June 7, 2012). Talk: “An elementary proof of uniqueness of the particle trajectories for solutions of a class of 2D shear-thinning non-Newtonian fluids.”
- HYP2012, 14th Intl. Conf. on Hyperbolic Problems: Theory, Numerics, Applications (Padova, June 25–29, 2012). Talk “On the long-time behavior of 2D dissipative Euler equations.”
- 6th European Congress of Mathematics. Mini-symposium on 2D Euler equations (Krakow, July 3–7, 2012). Talk: “On the attractors for 2D Euler equations with dissipation.”

- International Winter School on Mathematical Fluid Dynamics (Levico Terme, Dec. 16–21, 2012). Talk: “Pulsatile viscous flows in elliptical vessels and annuli, with application to blood and cerebrospinal fluid flow.”

2013

- Ercoftac Workshop Direct and Large-Eddy Simulation 9 (Dresden, Germany, April 3–5, 2013). Talk: “Direct numerical simulation of a compressible multiphase flow through the fast Eulerian approach.”
- Dept. of Math., Freiburg University (Germany, Apr 23, 2013). Talk: “Attractors for the 2D Euler equations.”
- Math. Institute, Basel (Switzerland, Apr. 24, 2013) Talk: “Uniqueness of particle trajectories for incompressible fluids.”
- SIAM conference on Mathematical & Computational Issues in the Geosciences, Padova (June 17-20, 2013), Talk: “On the transport of particles in oceanic flows: Modeling, theory and Experiments.”
- Conference: Mathematics and Geosciences: Global and Local Perspectives ICMAT, Madrid (Spain, Nov. 4-8, 2013), Talk: “On the Large Eddy Simulation of some multiphase problems in geophysics.”
- University Rennes 1, UFR Mathématiques (Dec 2013) Talk: “When mathematicians go climbing a volcano.” Colloquium.

2014

- Recent Advances in PDEs and Applications (Levico Terme, Feb. 17–21, 2014). Talk: “On suitable weak solutions to the Navier-Stokes equations.”
- Dep. of Math. Pisa (April 9, 2014), PDE seminar. Talk: “On the existence of almost periodic solutions for two non standard problems.”
- Fluid Dynamics and Electromagnetism: Theory and Numerical Approximation (Levico Terme, June 3-6, 2014). Talk: “On the regularity of solutions of some Boundary Values Problems arising in fluid mechanics.”
- Transport, microscales, and fluids @GSSI L’Aquila (L’Aquila, June 9-14, 2014) Talk: “Recent advances in the analysis of multiphase compressible flows”
- Classical Problems and New Trends in Mathematical Fluid Dynamics (Ferrara, Sep 2014) Talk: “On suitable weak solutions”

2015

- *Meeting on honor of L. Nirenberg* (Pisa, June 19 2015) Talk: “Compressible Navier-Stokes equations and applications to volcanology”
- Dept. of Math., Freiburg University (Germany, Jul 5, 2015). Talk: “On the regularity for the Stokes system: old, very old, and rather new”
- Dept. of Math. Darmstadt (Germany, Oct 20 2015). Talk in the International Research Training group “Almost periodic solutions to some problems in fluid mechanics.”
- Dept. of Math. Darmstadt (Germany, Oct 21 2015). Talk: “On averaged equations for turbulent flows,” Mathematisches Kolloquium.

2016

- University Rennes 1, UFR Mathématiques (Feb 2016) Talk: The Stokes problem: something (not new) about something certainly old.
- Fall Western Sectional Meeting (Denver, CO, October 8-9, 2016) Talk: “On the local energy inequality for the Navier-Stokes equations.”
- Freiburg-Pisa Workshop in Math. Analysis (Pisa, October, 21–23, 2016) Talk: “On the energy inequality for viscous fluids”

2017

- Ercoftac Workshop Direct and Large-Eddy Simulation 11 (Pisa, May, 29–31, 2017). Talk: “Large Eddy Simulation Reduced Order Modeling: A Numerical Investigation Of Spatial Filtering”
- Conference IperPV2017 XVII Italian Meeting on Hyperbolic Equations (Pavia, Sep. 6–8, 2017). Talk: “Entropy or physically-relevant solutions in incompressible fluids” (Main Speaker)
- Heriot-Watt Univ. (Edinburgh, Nov. 10, 2017). Talk: “On the regularity for nonlinear systems of the p-Stokes type”
- Mini-Workshop on Singular Variational Problems (Freiburg Germany, Nov, 19, 2017). Talk: “Time averages and Reynolds equations for dissipative equations.”

2018

- Conference: Partial Differential equations in fluid mechanics (Pisa, Feb. 5–7, 2018). Talk: “On the Reynolds equations, with applications to ensemble averages.”
- New York Univ. Abu Dhabi (Abu Dhabi EAU, April 9, 2018) Talk: “When mathematicians go ...close to a volcano.”
- Conference Recent Advances in Nonlinear Analysis (Levico Terme, May 28–30, 2018). Talk: “Classical solutions of the divergence and curl equation with Dirichlet condition.”
- Conference Workshop on Mathematical fine structures in fluid dynamics (L’Aquila, June 11-15, 2018) “On the energy conservation for viscous fluids.”

2019

- Conference: Elsevier - JMAA Conference on Nonlinear Analysis (AGH, Krakow, Poland, Oct 11-12, 2019) “Turbulent flows as generalized Kelvin-Voigt materials: modeling by non-uniformly elliptic and pseudo-parabolic equations.”
- Conference: LIASFMA China-Italy Conference on Partial Differential Equations and Their Applications (Fudan Univ Shanghai, PRC, Dec 9–13, 2019) “On the energy equality and inequality for the 3D Navier-Stokes.”

2021

- Conference Analysis Day - on the occasion of the retirement of Professor Reinhard Farwig (Darmstadt June 18, 2021) “Natural second-order regularity for parabolic systems.”
- Conference: PDEs and continuum mechanics (RifM, Varese, July 21-23, 2021) “Boundary regularity for elliptic/parabolic systems.”
- Workshop “TURB1D 2021” (Santander Spain, Nov. 2–3, 2021) “On the unsteady rotational Smagorinsky (Baldwin-Lomax) model”

2022

- International Conference on Nonlinear Differential Equations and Applications (Évora, Portugal Jul. 3–6, 2022) “Pseudo monotone operators and the unsteady rotational Smagorinsky model”

2023

- Computer, Electrical and Mathematical Sci. and Eng. Dept., (KAUST, Saudi Arabia, Feb. 7, 2023) Talk: “On the Mathematics of turbulent flows”
- New York Univ. Abu Dhabi (Abu Dhabi EAU, April 25, 2023) Talk: “On rotational eddy viscosity models”
- Computer, Electrical and Mathematical Sci. and Eng. Dept., (KAUST, Saudi Arabia, May 9, 2023) Colloquium: “On some nonlinear elliptic/parabolic systems arising in mechanics and turbulence”
- Conference: meeting on nonlinear evolution pdes, fluid dynamics and transport equations (Erice, May 25–31, 2023) Talk: “Eddy viscosity models based on vorticity”.
- Politecnico di Milano (Milan, Jun 29, 2023) Talk: “Energy conservation or anomalous dissipation for incompressible fluids”.
- Università di Firenze (Firenze, Dec. 6, 2023) Meeting: MathAnalysis@UniFIPI V, Talk: “Energy conservation for incompressible viscous fluids”.

2024

- Mathematical Institute, Oxford (Oxford UK, May 6, 2024) Talk: “On Galerkin approximations of the 2D Euler equations”.
- Wave Dynamics and Fluid Structure Interactions, (Como May 27-31 2024). Talk: “Fourier-Galerkin approximation of the solutions of the 2D Euler equations with bounded vorticity”.
- AMS UMI joint meeting (Palermo, July 23-26, 2024). Talk: “Boundary layers equations with an eddy viscosity vanishing at the boundary.”
- Nonlinear Partial Differential Equations in Freiburg (Freiburg Germany, Oct. 2-4, 2024) Talk: “Geometrical criteria and ”regular” solutions to the Navier-Stokes equations.”

2025

- Fluids@PoliMi (Jan 8-10, 2025) Talk: “Absence of anomalous dissipation for weak solutions of the Maxwell-Stefan system.”
- 13th Meeting on Nonlinear Evolution PDEs, Fluid Dyn. and Transport Eqs, (Sissa, Feb 17–21, 2025) Talk: “On the Geometry of regular solutions to the 3D Navier-Stokes equations.”
- Boundary Analysis for Dispersive and Viscous Fluids, (Pavia, Sep 3-5 2025) Talk: “Pulsatile flow for a simplified smart fluid with variable power-law: Analysis and numerics”

Monografie

- Luigi C. Berselli, *Three-Dimensional Navier-Stokes Equations for Turbulence*, Mathematics in Science and Engineering. Academic Press, London, [2021], ©2021. xiii+313 pp. ISBN: 978-0-12-821954-6 MR 4284207 [link](#)
- Luigi C. Berselli, Traian Iliescu, and William J. Layton *Mathematics of Large Eddy Simulation of Turbulent Flows*, pp. xviii+348, (2006), ISBN 3-540-26316-0 Springer series in Scientific Computation. MR 2185509 (2006h:76071) [Publisher link](#)

Articoli di ricerca (in ordine cronologico inverso)

115. Luigi C. Berselli, Alessio Falocchi, and Rossano Sannipoli, *On a 3D Stokes eigenvalue problem under Navier slip-with-friction boundary conditions and applications to Navier-Stokes equations*, Z. Angew. Math. Phys. **76**, 175 (2025) doi:10.1007/s00033-025-02556-0
114. Luigi C. Berselli and Alex Kaltenbach, *Convergence analysis for a finite element approximation of the unsteady $p(\cdot, \cdot)$ -Navier–Stokes equations*, Numer. Math. **157**, no. 2, 573–627 (2025) doi:10.1007/s00211-025-01450-1
113. Luigi C. Berselli, Stefanos Georgiadis and Athanasios E. Tzavaras, *Absence of anomalous dissipation for weak solutions of the Maxwell-Stefan system*, Nonlinearity **38** (2) 025018 (2025) doi:10.1088/1361-6544/ada7b8
112. Chérif Amrouche, Luigi C. Berselli, François Legeais, Guillaume Leloup, and Roger Lewandowski, *Singular boundary condition for a degenerated turbulent toy model*, Pure Appl. Funct. Anal. **10** 11–29 (2025).
111. Luigi C. Berselli and Alex Kaltenbach, and Michael Růžička, *Energy conservation for weak solutions of incompressible Newtonian fluid equations in Hölder spaces with Dirichlet boundary conditions in the half-space*, Math. Ann. **391**, no. 4, 5911–5940 (2025). doi:10.1007/s00208-024-03065-7
110. Luigi C. Berselli and Alex Kaltenbach, *Error analysis for a finite element approximation of the steady $p(\cdot)$ -Navier–Stokes equations*, IMA J. Numer. Anal. **45**, no. 5, 3026–3076 (2025). doi:10.1093/imanum/drae082
109. Luigi C. Berselli, Elisabetta Chiodaroli, and Rossano Sannipoli, *Energy conservation for 3D Euler and Navier-Stokes equations in a bounded domain. Applications to Beltrami flows*, J. Nonlinear Sci., **35**: 10 (2025) doi:10.1007/s00332-024-10102-x
108. Luigi C. Berselli and Rossano Sannipoli, *Velocity-vorticity geometric constraints for the energy conservation of 3D ideal incompressible fluids*, J. Geom. Anal. **34**, 259 (2024). doi:10.1007/s12220-024-01704-8
107. Luigi C. Berselli and Stefano Spirito, *Fourier-Galerkin approximation of the 2D Euler equations*, J. Hyperbolic Differ. Equ. **21** (3) 503–522 (2024). doi:10.1142/S0219891624400010
106. Luigi C. Berselli, *On a Rotational Smagorinsky Model for Turbulent Fluids: An Overview of Recent Results in the Steady and Unsteady Cases*. In: Beirão da Veiga, H., Minhós, F., Van Goethem, N., Sanchez Rodrigues, L. (eds) Nonlinear Differential Equations and Applications. pp 27–46 PICNDEA 2022. CIM Series in Mathematical Sciences, vol 7. Springer, Cham. doi:10.1007/978-3-031-53740-0_2
105. Luigi C. Berselli and Stefanos Georgiadis, *Three results on the Energy conservation for the 3D Euler equations*, NoDEA Nonlinear Differential Equations Appl. **31**:33 (2024) doi:10.1007/s00030-024-00924-9
104. Luigi C. Berselli, François Legeais, and Roger Lewandowski, *Surface boundary layers through a scalar equation with an eddy viscosity vanishing at the ground*, ESAIM Math. Model. Numer. Anal. **58**, 489–513 (2024) doi:10.1051/m2an/2024009
103. Luigi C. Berselli, *Energy conservation for weak solutions of incompressible fluid equations: the Hölder case and connections with Onsager’s conjecture*, J. Differential Equations **368**, 350–375 (2023). doi:10.1016/j.jde.2023.06.002
102. Luigi C. Berselli, *On the vorticity direction and the regularity of 3D Navier-Stokes equations*, Nonlinearity **36** 4303–4313 (2023) doi:10.1088/1361-6544/ace096

101. Luigi C. Berselli, Alex Kaltenbach, Roger Lewandowski, and Michael Růžička, *On the existence of weak solutions for a family of unsteady rotational Smagorinsky models*, Pure Appl. Funct. Anal. **8**, 83–102 (2023). [link](#)
100. Luigi C. Berselli, *Remarks on the “Onsager singularity theorem” for Leray-Hopf weak solutions: the Hölder continuous case*, Mathematics **11**, (4) 1062 (2023) doi:10.3390/math11041062
99. Luigi C. Berselli and Stefano Spirito, *Convergence of second-order in time numerical discretizations for the evolution Navier-Stokes equations*, Adv. Contin. Discrete Models (2022) 65 doi:10.1186/s13662-022-03736-2
98. Luigi C. Berselli and Michael Růžička, *Natural second order regularity for systems in the case $1 < p \leq 2$ using the A-approximation*, 3–37 (2022) In Carapau, F., Vaidya, A. (eds) Recent Advances in Mechanics and Fluid-Structure Interaction with Applications. Advances in Mathematical Fluid Mechanics. Birkhäuser, Cham. doi:10.1007/978-3-031-14324-3_1
97. Luigi C. Berselli, and Michael Růžička, *Natural second-order regularity for parabolic systems with stress tensor with (p, δ) -structure and depending only on the symmetric gradient*, Calc. Var. Partial Differential Equations. **61**, 137 (2022) doi:10.1007/s00526-022-02247-y
96. Luigi C. Berselli and Michael Růžička, *Space-time discretization for nonlinear parabolic systems with p -structure*, IMA J. Numer. Anal. **42** (2022) 260–299 doi:10.1093/imanum/draa079
95. Mohamed Abdelwahed, Luigi C. Berselli and Nejmeddine Chorfi, *On the uniqueness for weak solutions of steady double-phase fluids* Adv. Nonlinear Anal. **11** (2022) 454–468. doi:10.1515/anona-2020-0196
94. Luigi C. Berselli, Alex Kaltenbach, and Michael Růžička, *Analysis of fully discrete, quasi non-conforming approximations of evolution equations and applications*, Math. Models Methods Appl. Sci. **31** (2021) 2297–2343 doi:10.1142/S0218202521500494
93. Luigi C. Berselli and Michael Růžička, *Optimal error estimate for a space-time discretization for incompressible generalized Newtonian fluids: The Dirichlet problem*, SN Partial Differ. Equ. Appl. **2** (2021) 59 doi:10.1007/s42985-021-00082-y
92. Luigi C. Berselli and Elisabetta Chiodaroli, *Remarks On the energy equality for the 3D Navier–Stokes equations*, In: Bodnár T., Galdi G.P., Nečasová Š. (eds) Waves in Flows (2021), pp 91–107. Advances in Mathematical Fluid Mechanics. Birkhäuser, Cham. doi:10.1007/978-3-030-68144-9_3
91. Luigi C. Berselli and Stefano Spirito, *On the existence of Leray-Hopf Weak Solutions to the Navier-Stokes equations*, Fluids (2021), 6(1), 42 doi:10.3390/fluids1010000
90. Luigi C. Berselli, Roger Lewandowski, and Dinh Duong Nguyen, *Rotational forms of Large Eddy Simulation turbulence models: modeling and mathematical theory*, Chin. Ann. Math. Ser. B **42** (2021) 17–40 doi:10.1007/s11401-021-0001-2
89. Luigi C. Berselli and Dominic Breit, *On the existence of weak solutions for the steady Baldwin-Lomax model and generalizations*, J. Math Anal. Appl. **501** (2021), 124643 doi:10.1016/j.jmaa.2020.124633
88. Luigi C. Berselli, Argus A. Dunca, Roger Lewandowski, and Dinh Duong Nguyen, *Modeling Error of α -Models of Turbulence on a Two-Dimensional Torus*, Discrete Contin. Dynam. Systems Series B **22** (2020), 4613–4643 doi:10.3934/dcdsb.2020305
87. Luigi C. Berselli and Placido Longo, *Classical solutions of the divergence equation with Dini-continuous datum*, J. Math. Fluid Mech. **22**, 26 (2020) doi:10.1007/s00021-020-0488-4
86. Nejmeddine Chorfi, Mohamed Abdelwahed, and Luigi C. Berselli *On the analysis of a geometrically selective turbulence model*, Adv. Nonlinear Anal. **9** (2020) 1402–1419 doi:10.1515/anona-2020-0057.

85. Cherif Amrouche, Luigi C. Berselli, Roger Lewandowski, and Dinh Duong Nguyen, *Turbulent flows as generalized Kelvin-Voigt materials: modeling and analysis*, Nonlinear Anal. **196** (2020) 111790 doi:10.1016/j.na.2020.111790
84. Luigi C. Berselli and Michael Růžička, *On the regularity of solution to the time-dependent p -Stokes system*, Opuscula Math. **40** (2020) 49–69 doi:10.7494/OpMath.2020.40.1.49
83. Luigi C. Berselli and Elisabetta Chiodaroli, *On the energy equality for the 3D Navier–Stokes equations*, Nonlinear Anal. **192** (2020) 111704, 24 pp doi:10.1016/j.na.2019.111704
82. Luigi C. Berselli and Michael Růžička, *Global regularity for systems with p -structure depending on the symmetric gradient*, Adv. Nonlinear Anal. **9** (2020) 176–192. doi:10.1515/anona-2018-0090
81. Luigi C. Berselli and Roger Lewandowski, *On the Reynolds time-averaged equations and the long-time behavior of Leray–Hopf weak solutions, with applications to ensemble averages*, Nonlinearity **32** (2019) 4579–4608 doi:10.1088/1361-6544/ab32bc
80. Luigi C. Berselli, Simone Fagioli, and Stefano Spirito, *Suitable weak solutions of the Navier–Stokes equations constructed by a space-time numerical discretization*, J. Math. Pures Appl. (9) **125** (2019) 189–208. doi:10.1016/j.matpur.2018.09.004
79. Luigi C. Berselli, Traian Iliescu, Birgul Koc, and Roger Lewandowski, *Long-Time Reynolds Averaging of Reduced Order Models for Fluid Flows: Preliminary Results*, Math. in Engineering, **2** (2019) 1–25. doi:10.3934/mine.2020001
78. Vieri Benci, Luigi C. Berselli, and Carlo R. Grisanti, *The Caccioppoli Ultrafunctions*, Adv. Nonlinear Anal. (2019) 8(1): 946–978. doi:10.1515/anona-2017-0225
77. Luigi C. Berselli and Davide Catania, *A note on the Euler–Voigt System in a 3D Bounded Domain: Propagation of Singularities and Absence of the Boundary Layer*, AIMS Mathematics, **4**(1) (2019) 1–11. doi:10.3934/Math.2019.1.1
76. Luigi C. Berselli, David Wells, Traian Iliescu, and Xuping Xie, *Large Eddy Simulation Reduced Order Models*, pp.151–157 in Direct and Large-Eddy Simulation XI. Springer Verlag. ERCOFTAC Series, Vol. 25 M. V. Salvetti *et al.* (Eds.) 2019 XXV, 551 p. 390 illus. ISBN 978-3-030-04915-7, doi:10.1007/978-3-030-04915-7_21
75. Luigi C. Berselli and Placido Longo, *Classical solutions for the system $\operatorname{curl} v = g$, with vanishing Dirichlet boundary conditions*, Discrete Contin. Dynam. Systems Series S. **12** (2019) 215–229 doi:10.3934/dcdss.2019015
74. Luigi C. Berselli and Roger Lewandowski, *On the Bardina’s model in the whole space*, 2018 J. Math. Fluid Mech. **20** (2018) 1335–1351. doi:10.1007/s00021-018-0369-2
73. Luigi C. Berselli and Stefano Spirito, *On the convergence of a fully discrete scheme of LES type to physically relevant solutions of the incompressible Navier–Stokes*, (2018) Z. Angew. Math. Phys. **69** 61 doi:10.1007/s00033-018-0955-4
72. Luigi C. Berselli, *Weak solutions constructed by semi-discretization are suitable: the case of slip boundary conditions*, Int. J. Numer. Anal. Model. **15** (2018) 479–481.
71. Luigi C. Berselli and Stefano Spirito, *On the construction of suitable weak solutions to the 3D Navier–Stokes equations in a bounded domain by an artificial compressibility*, Commun. Cont. Math. **20** (2018) 1650064 (16 pages). MR 3714830 doi:10.1142/S0219199716500644
70. Luigi C. Berselli and Michael Růžička, *Global regularity properties of steady shear thinning flows*, J. Math Anal. Appl. **450** (2017) 839–871. MR 3639077 doi:10.1016/j.jmaa.2017.01.016

69. Luigi C. Berselli and Stefano Spirito, *Suitable weak solutions to the 3D Navier-Stokes equations are constructed with the Voigt approximation*, J. Differential Equations, **262** (2017) 3285–3316. MR 3584893 doi:10.1016/j.jde.2016.11.027
68. Matteo Cerminara, Tomaso Esposti Ongaro, and Luigi C. Berselli, *ASHEE: a compressible, equilibrium-Eulerian model for volcanic ash plumes*, Geosci. Model Dev. **9** (2016) 697–730. doi:10.5194/gmd-9-697-2016
67. Luigi C. Berselli and Stefano Spirito, *Weak solutions to the Navier-Stokes equations constructed by semi-discretization are suitable*, in Recent Advances in Partial Differential Equations and Applications, 85–97, Contemp. Math., 666 Amer. Math. Soc., Providence, RI, 2016. MR 3537460 doi:10.1090/conm/666/13243
66. Luigi C. Berselli, Tae-Yeon Kim, and Leo G. Rebholz, *Analysis of a Reduced-Order Approximate Deconvolution Model and its interpretation as a NS-Voigt regularization*, Discrete Contin. Dynam. Systems Series B **21** (2016) 1027–1050. MR 3483551 doi:10.3934/dcdsb.2016.21.1027
65. Luigi C. Berselli, Dominic Breit, and Lars Diening, *Convergence Analysis for a Finite Element Approximation of a Steady Model for Electrorheological Fluids*, Numer. Math. **132** (2016) 657–689. MR 3474486 doi:10.1007/s00211-015-0735-4
64. Luigi C. Berselli and Carlo R. Grisanti, *On the regularity up to the boundary for certain nonlinear elliptic equations*, Discrete Contin. Dynam. Systems Series S. **9** (2016) 51–71. MR 3461647 doi:10.3934/dcdss.2016.9.53
63. Luigi C. Berselli and Davide Catania, *On the Boussinesq equations with anisotropic filter in a vertical pipe*, Dyn. Partial Differ. Equ. **12** (2015), 177–192. MR 3361247 doi:10.4310/DPDE.2015.v12.n2.a5
62. Luigi C. Berselli and Davide Catania, *On the well-posedness of the Boussinesq equations with anisotropic filter for turbulent flows*, ZAA-Z. Anal. Anwend. **34** 2015, 61–83. MR 3300958 doi:10.4171/ZAA/1529
61. Luigi C. Berselli and Jishan Fan, *Logarithmic and improved regularity criteria a for the 3D nematic liquid crystals models, Boussinesq system, and MHD equations in a bounded domain*, Commun. Pure Appl. Anal. **14** (2015), 637–655. MR 3311748 doi:10.3934/cpaa.2015.14.637
60. Luigi C. Berselli, Matteo Cerminara, and Traian Iliescu *Disperse two-phase flows, with applications to geophysical problems*, Pure Appl. Geophys. **172** (2015), 181–196. doi:10.1007/s00024-014-0889-5
59. Luigi C. Berselli and Luca Bisconti, *On the Existence of Almost-Periodic Solutions for the 2D Dissipative Euler Equations*, Rev. Mat. Iberoam. **31** (2015), 267–290. MR 3320840 doi:10.4171/RMI/833
58. Luigi C. Berselli, Lars Diening, and Michael Růžička, *Optimal error estimate for semi-implicit space-time discretization for the equations describing incompressible generalized Newtonian fluids*, IMA J. Numer. Anal. **35** (2015), 680–697. MR 3335220 doi:10.1093/imanum/dru008
57. Matteo Cerminara, Luigi C. Berselli, Tomaso Esposti Ongaro, and Maria Vittoria Salvetti, *Direct numerical simulation of a compressible multiphase flow through the Eulerian approach*, pp. 639–645 in Direct and Large-Eddy Simulation IX. Springer Verlag. ERCOFTAC Series, Vol. 20 J. Fröhlich, H. Kuerten, B.J. Geurts, V. Armenio (Eds.) 2015, XX, 700 p. 401 illus. ISBN 978-3-319-14447-4 978-3-319-14447-4
56. Luigi C. Berselli, *A note on strong solutions to the Stokes system*, Acta Appl. Math. **134** (2014), 123–131. MR 327368 doi:10.1007/s10440-014-9873-4

55. Luigi C. Berselli, Diego Cordoba, and Rafael Granero-Belinchon, *Local solvability and turning for the inhomogeneous Muskat problem*, Interfaces Free Boundaries **16** (2014), 175–213. MR 3231970 doi:10.4171/IFB/317
54. Luigi C. Berselli, Barbara Mazzolai, Francesca Guerra, and Edoardo Sinibaldi, *Pulsatile Viscous Flows in Elliptical Vessels and Annuli: Solution to the Inverse Problem, with Application to Blood and Cerebrospinal Fluid Flow*, SIAM J. Appl. Math. **74** (2014) 40–59. MR 3151393 doi:10.1137/120903385
53. Luigi C. Berselli, *Some results on the two-dimensional dissipative Euler equations*, pp. 325–332, Hyperbolic Problems: Theory, Numerics, Applications. (2014) F. Ancona, A. Bressan, P. Marcati, A. Marson Eds. (Proceedings of the International Conference HYP2012), AIMS Appl. Math. Vol. 8, ISBN-13: 978-1-60133-017-8 <http://aims sciences.org/books/am/AMVol8.html>
52. Stefano Spirito and Luigi C. Berselli, *On inviscid limits for the Navier-Stokes equations with slip boundary conditions involving the vorticity*, pp. 967–974, Hyperbolic Problems: Theory, Numerics, Applications. (2014) F. Ancona, A. Bressan, P. Marcati, A. Marson Eds. (Proceedings of the International Conference HYP2012), AIMS Appl. Math. Vol. 8, ISBN-13: 978-1-60133-017-8 <http://aims sciences.org/books/am/AMVol8.html>
51. Luigi C. Berselli and Stefano Spirito, *An elementary approach to inviscid limits for the 3D Navier-Stokes equations with slip boundary conditions and applications to the 3D Boussinesq equations*, NoDEA Nonlinear Differential Equations Appl. **21** (2014), 149–166 MR 3180880 doi:10.1007/s00030-013-0242-1
50. Luigi C. Berselli and Luca Bisconti, *An elementary proof of uniqueness of the particle trajectories for solutions of a class of 2D shear-thinning non-Newtonian fluids*, Nonlinearity, **26** (2013), 1031–1047 MR 3040594 doi:10.1088/0951-7715/26/4/1031
49. Luigi C. Berselli, Davide Catania, and Roger Lewandowski, *Convergence of approximate deconvolution models to the mean Magnetohydrodynamics Equations: Analysis of two models*, J. Math. Anal Appl. **401** (2013) 864–880. MR 3018034 doi:10.1016/j.jmaa.2012.12.051
48. Luigi C. Berselli, Piero Miloro, Arianna Menciassi, and Edoardo Sinibaldi, *Exact solution to the inverse Womersley problem for pulsatile flows in cylindrical vessels, with application to magnetic particle targeting*, Appl. Math. Comput. **219** (2013) 5717–5729 MR 3009524 doi:10.1016/j.amc.2012.11.071
47. Luigi C. Berselli, Davide Catania, and Roger Lewandowski, *Existence and convergence of an MHD approximate deconvolution model*, ESAIM Proc. **39** (2013) 25–31. MR 3074160 doi:10.1051/proc/201339004
46. Luigi C. Berselli and Stefano Spirito, *On the vanishing viscosity limit for the Navier-Stokes equations under slip boundary conditions in general domains*, Comm. Math. Phys. **316** (2012) 171–198. MR 2989457 doi:10.1007/s00220-012-1581-1
45. Luigi C. Berselli, *Towards fluid equations by Approximate Deconvolution Models*, in Mathematical Aspects of Fluid Mechanics, 1–22, London Math. Soc. Lecture Note Ser. (402), Cambridge Univ. Press, Cambridge, 2012, MR 3050289 ISBN:9781107609259
44. Luigi C. Berselli and Marco Romito, *On Leray’s problem for almost periodic flows*, J. Math. Sci. Univ. Tokyo **19** (2012) 69–130. MR 2977342 [Journal link](#)
43. Ludmilla Belenki, Luigi C. Berselli, Lars Diening, and Michael Růžička, *On the finite element approximation of the p -Stokes problem*, SIAM J. Numer. Anal. **50** (2012) 373–397. MR 2914267 doi:10.1137/10080436X

42. Luigi C. Berselli and Roger Lewandowski, *Convergence of approximate deconvolution models to the mean Navier-Stokes Equations*, Ann. Inst. H. Poincaré Anal. Non Linéaire, **29** (2012) 171–198. MR 2901193 doi:10.1016/j.anihpc.2011.10.001
41. Luigi C. Berselli, *Analysis of a Large Eddy Simulation model based on anisotropic filtering*, J. Math. Anal. Appl. **386** (2012) 149–170. MR 2834874 (2012g:76089) doi:10.1016/j.jmaa.2011.07.044
40. Luigi C. Berselli and Luca Bisconti, *On the structural stability of the Euler-Voigt and Navier-Stokes Voigt models*, Nonlinear Anal., **75** (2012) 117–130. MR 2846786 doi:10.1016/j.na.2011.08.011
39. Luigi C. Berselli and Stefano Spirito, *A remark on the Euler equations in dimension two* (Proceedings of the “Intensive Research Month on Hyperbolic Conservation Laws and Fluid Dynamics” Parma, Italy, February 1 - 28, 2010) Riv. Mat. Univ Parma (8), **3** (2012), 1–23. MR 2976418 Journal link
38. Luigi C. Berselli and Stefano Spirito, *On the Boussinesq system: regularity criteria and singular limits*, Methods Appl. Anal. **18** (2011) 391–416. MR 2965984 doi:10.4310/MAA.2011.v18.n4.a3
37. Luigi C. Berselli, Paul F. Fischer, Traian Iliescu, and Tamay Özgökmen, *Horizontal Large Eddy Simulation of Stratified Mixing in a Lock-Exchange System*, J. Sci. Comput. **49** (2011) 3–20 MR 2831668 doi:10.1007/s10915-011-9464-8
36. Luigi C. Berselli, Paul F. Fischer, Traian Iliescu, and Tamay Özgökmen, *Horizontal Approximate Deconvolution for Stratified Flows: Analysis and Computations*. In Quality and reliability of large-eddy simulations II, 399–410, ERCOFTAC Series vol. 16, Berlin, Springer, 2011. doi:10.1007/978-94-007-0231-8_36
35. Luigi C. Berselli, *Some results on the Navier-Stokes equations with Navier boundary conditions*, Riv. Mat. Univ Parma (8) **1** 2010, 1–75. (Special volume with the proceedings of the “Seventh meeting on hyperbolic conservation laws and fluid dynamics: recent results and research perspectives,” SISSA, Trieste Aug. 31, Sep. 4, 2009) MR 2761078 (2012d:35267)
34. Luigi C. Berselli, *An elementary approach to the 3D Navier-Stokes equations with Navier boundary conditions: Existence and uniqueness of various classes of solutions in the flat boundary case*. Discrete Contin. Dynam. Systems Series S. **3** (2010), 199–219. MR 2610559, doi:10.3934/dcdss.2010.3.199
33. Luigi C. Berselli, Lars Diening, and Michael Růžička, *Existence of strong solutions for incompressible fluids with shear dependent viscosities*. J. Math. Fluid Mech. **12** (2010) 101–132. MR 2602916, doi:10.1007/s00021-008-0277-y
32. Luigi C. Berselli and Franco Flandoli, *On a Stochastic Approach to Eddy Viscosity Models for Turbulent Flows*. In Advances in Mathematical Fluid Mechanics, 55–81 Springer Berlin, 2010. MR 2665025 (2011e:35413) doi:10.1007/978-3-642-04068-9_5
31. Luigi C. Berselli, *Some criteria concerning the vorticity and the problem of global regularity for the 3D Navier-Stokes equations*. Ann. Univ. Ferrara Sez. VII Sci. Mat. **55** (2009), 209–224. MR 2563656, doi:10.1007/s11565-009-0076-2
30. Luigi C. Berselli, *Some geometric constraints and the problem of global regularity for the Navier-Stokes equations*. Nonlinearity **22** (2009), 2561–2581. MR 2539768, doi:10.1088/0951-7715/22/10/013
29. Luigi C. Berselli and Diego Còrdoba, *On the regularity of the solutions to the 3D Navier-Stokes equations: a remark on the role of the helicity*. C. R. Acad. Sci. Paris, Ser I, **347** (2009), 613–618. MR 2532916, doi:10.1016/j.crma.2009.02.003

28. Luigi C. Berselli, Lars Diening, and Michael Růžička, *Optimal error estimates for a semi-implicit Euler scheme for incompressible fluids with shear dependent viscosities*. SIAM J. Numer. Anal. **47** (2009), 2177–2202. MR 2519599, doi:10.1137/080720024
27. Luigi C. Berselli, *On the $W^{2,q}$ -regularity of incompressible fluids with shear-dependent viscosities: The shear thinning case*. J. Math. Fluid Mech **11** (2009), 171–185. MR 2516130, doi:10.1007/s00021-008-0254-5
26. Hugo Beirão da Veiga and Luigi C. Berselli, *Navier-Stokes equations: Green matrices, vorticity direction, and regularity up to the boundary*, J. Differential Equations **246** (2009) 597–628. MR 2468730, doi:10.1016/j.jde.2008.02.043
25. Luigi C. Berselli, Carlo R. Grisanti, and Volker John, *Analysis of commutation errors for functions with low regularity*, J. Comput. Appl. Math. **206** (2007), 1027–1045. MR 2333730 (2009e:76094) doi:10.1016/j.cam.2006.09.011
24. David Barbato, Luigi C. Berselli, and Carlo R. Grisanti, *Analytical and numerical results for the Rational Large Eddy Simulation model*, J. Math. Fluid Mech. **9** (2007), 44–74. MR 2305825 (2009b:76080) doi:10.1007/s00021-006-0191-0.
23. Luigi C. Berselli and Massimiliano Gubinelli, *On the global evolution of vortex filaments, blobs, and small loops in 3D ideal flows*, Comm. Math. Phys. **269** (2007), 693–713. MR 2276358 (2007m:76027) doi:10.1007/s00220-006-0142-x.
22. Luigi C. Berselli and Volker John, *Asymptotic behavior of commutation errors and the divergence of the Reynolds stress tensor near the wall in the turbulent channel flow*, Math. Meth. Appl. Sci., **29** (2006) 1709–1719. MR 2248564(2008a:76071) doi:10.1002/mma.750
21. Luigi C. Berselli and Marco Romito, *On the existence and uniqueness of weak solutions for a vorticity seeding model*, SIAM J. Math. Anal. **37** (2006), 1780–1799. MR 2213394 (2007a:35115) doi:10.1137/04061249X.
20. Luigi C. Berselli, *On the Large Eddy Simulation of the Taylor-Green vortex*, J. Math. Fluid Mech. **7** (2005) S164–S191. MR 2192847 (2006j:76072) doi:10.1007/s00021-005-0152-z
19. Luigi C. Berselli and Paolo Guasoni, *Some problems of shape optimization arising in stationary fluid motion*, Adv. Math. Sci. Appl., **14** (2004) no. 1, 279–293. MR 2083629 (2005d:49059) Journal link
18. Luigi C. Berselli and Giovanni P. Galdi, *On the space-time regularity of $C(0,T;L^n)$ -very weak solutions to the Navier-Stokes equations*, Nonlinear Anal. **58** (2004), no. 5-6, 703–717. MR 2078742 (2006b:35254) doi:10.1016/j.na.2005.05.034 Corrigendum: *ibidem* **63** (2005), 642.
17. Luigi C. Berselli and Carlo R. Grisanti, *On the consistency of the Rational Large Eddy Simulation model*, Comput. Vis. Sci. **6** (2004), 75–82. MR 2061268 (2005e:76055) doi:10.1007/s00791-003-0111-2
16. Luigi C. Berselli and Renato Manfrin, *On a theorem by Sohr for the Navier-Stokes equations*, J. Evol. Equ. **4** (2004), no. 1, 193–211. MR 2059302 (2005b:35216) doi:10.1007/s00028-003-1135-2
15. Luigi C. Berselli and Traian Iliescu, *A Higher Order Subfilter-Scale Model for Large Eddy Simulation*, J. Comput. Appl. Math. **159** (2003) 411–430. MR 2005969 (2004f:76076) doi:10.1016/S0377-0427(03)00544-2
14. Luigi C. Berselli, *Vanishing viscosity limit and long-time behavior for 2D quasi-geostrophic equations*, Indiana Univ. Math. J. **51** (2002), no. 4, 905–930. MR 1947863 (2005c:35237) doi:10.1512/iumj.2002.51.2075

13. Luigi C. Berselli and Hakima Bessaih, *Some results for the line vortex equation*, Nonlinearity **15** (2002), no. 6, 1729–1746. MR 1938468 (2003m:76028) doi:10.1088/0951-7715/15/6/301
12. Luigi C. Berselli, *A note on regularity of weak solutions of the Navier-Stokes equations in $\mathbf{R}^n$* , Japan. J. Math. (N.S.) **28** (2002), no. 1, 51–60. MR 1933477 (2003i:35223)
Journal link doi:10.4099/math1924.28.51
11. Luigi C. Berselli, Giovanni P. Galdi, Traian Iliescu, and William J. Layton, *Mathematical analysis for the rational large eddy simulation model*, Math. Models Methods Appl. Sci. **12** (2002), no. 8, 1131–1152. MR 1924604 (2003k:76077) doi:10.1142/S0218202502002057
10. Luigi C. Berselli, *On a regularity criterion for the solutions to the 3D Navier-Stokes equations*, Differential Integral Equations **15** (2002), no. 9, 1129–1137. MR 1919765 (2003e:35249) Permanent link
9. Luigi C. Berselli and Giovanni P. Galdi, *Regularity criteria involving the pressure for the weak solutions to the Navier-Stokes equations*, Proc. Amer. Math. Soc. **130** (2002), no. 12, 3585–3595 (electronic). MR 1920038 (2003e:35240) doi:10.1090/S0002-9939-02-06697-2
8. Hugo Beirão da Veiga and Luigi C. Berselli, *On the regularizing effect of the vorticity direction in incompressible viscous flows*, Differential Integral Equations **15** (2002), no. 3, 345–356. MR 1870646 (2002k:35248) Permanent link
7. Luigi C. Berselli and Renato Manfrin, *Linear perturbations of the Kirchhoff equation*, Comput. Appl. Math. **19** (2000), no. 2, 157–178. MR 1994873 (2004c:35276) Journal link
6. Luigi C. Berselli and Fausto Saleri, *New substructuring domain decomposition methods for advection-diffusion equations*, J. Comput. Appl. Math. **116** (2000), no. 2, 201–220. MR 1750917 (2001d:65120) doi:10.1016/S0377-0427(99)00317-9
5. Luigi C. Berselli and Jorge Ferreira, *On the magnetohydrodynamic type equations in a new class of non-cylindrical domains*, Boll. Unione Mat. Ital. Sez. B Artic. Ric. Mat. (8) **2** (1999), no. 2, 365–382. MR 1706576 (2000g:76109)
4. Luigi C. Berselli, *Sufficient conditions for the regularity of the solutions of the Navier-Stokes equations*, Math. Methods Appl. Sci. **22** (1999), no. 13, 1079–1085. MR 1706110 (2000f:35111)
doi:10.1002/(SICI)1099-1476(19990910)22:13<1079::AID-MMA71>3.0.CO;2-4
3. Luigi C. Berselli and Franco Flandoli, *Remarks on determining projections for stochastic dissipative equations*, Discrete Contin. Dynam. Systems **5** (1999), no. 1, 197–214. MR 1664501 (99i:35184)
doi:10.3934/dcds.1999.5.197
2. Luigi C. Berselli, *Remarks on the electrodynamics equations in a domain with moving boundary*, Bol. Soc. Parana. Mat. (2) **18** (1998), no. 1-2, 87–105 (2000). MR 1769797 (2001k:76096)
1. Luigi C. Berselli and Giovanni Cimatti, *A theorem of existence for the equations of the Winslow's effect*, Riv. Mat. Univ. Parma (5) **6** (1997), 61–71 (1998). MR 1632711 (99d:76005) Journal link

Altri Articoli

1. Luigi C. Berselli and Michael Růžička, Preface of the volume: *Progress in Fluid Mechanics*, Lecture Notes in Mathematics 2272, 2020, ISBN 978-3-030-54898-8

2. Ana Alonso Rodriguez, Luigi C. Berselli, Alessandro Morando, Paola. Trebeschi, Preface of the Special issue on "Fluid dynamics and electromagnetism: theory and numerical approximation". Discrete Contin. Dyn. Syst. Ser. S 9 (2016), no. 1, i
3. Adelia Sequeira, Joao Paulo Dias, Alberto Valli, Paolo Secchi, P.; Luigi C. Berselli, Francesca Crispo, Tributes to Hugo Beirão de Veiga. Recent advances in partial differential equations and applications, 1-22, Contemp. Math., 666, Amer. Math. Soc., Providence, RI, (2016).
4. Luigi C. Berselli, Intorno ad alcune questioni di meccanica dei fluidi, (Italian), Résumé of the Ph.D. Thesis, Boll. Unione Mat. Ital. Sez. A Mat. Soc. Cult. (8) III-A (2000), 271–274

Pre-prints

1. Luigi C. Berselli and Alex Kaltenbach, *Pulsatile Flows for a Simplified Smart Fluid with Variable Power-Law: Analysis and Numerics*, arXiv 2025, 2507.22449
2. Stefano Abbate, Luigi C. Berselli, Gianluca Crippa, and Stefano Spirito, *Convergence of the Euler-Voigt equations to the Euler equations in two dimensions*, arXiv 2025, 2503.01270
3. Luigi C. Berselli, Alex Kaltenbach, and Seungchan Ko, *Error analysis for a fully-discrete finite element approximation of the unsteady $p(\cdot, \cdot)$ -Stokes equations*, arXiv 2025, 2501.00849

Contatti

Luigi C. Berselli

Office Phone: +39 050 2213801 (Secretary)
Office Phone: +39 050 2213846 (Direct)
Office Fax: +39 050 2213813
Email: luigi.carlo.berselli@unipi.it
URL: <http://pagine.dm.unipi.it/berselli>
Office Address: Dipartimento di Matematica
Via F. Buonarroti 1/c
I-56127, Pisa, ITALIA

Last updated 3 dicembre 2025.