UNIVERSITY OF ROME "TOR VERGATA"

Curriculum Vitae

Luca Biferale
Born August 12, 1965, in Imperia (Italy)
Married, two children (born 1996 and 2000)
Nationality: Italian
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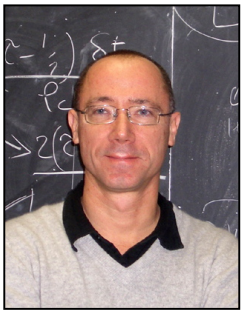

EDUCATION

Oct. 1992	PhD. U. of Rome *La Sapienza*. Title: Anomalous scaling laws in fully developed turbulence.
Mar. 1989	Master degree in Physics *cum laudem*, U. of Rome *Tor Vergata*. Title: Renormalization group study of XY and Heisenberg models in 2D.

CURRENT POSITION

Apr. 2014 - present	**Full Professor of Theoretical Physics**, **Mathematical and Numerical Modelling** Dept. Physics and CAST, University of Rome *Tor Vergata* (Italy)

OTHER POSITIONS

Jan. 2019	Visiting Professor at **SUSTech** (Shenzhen, Cina)
Mar. 2016	Visiting Professor at **Johns Hopkins University** (Baltimore, USA)
Jan. 2011 - Dec. 2011	Visiting Professor at **Technische University Eindhoven** (The Netherlands)
June 2011 & July 2012	Visiting Professor at **Observatory of Nice** (France)
July 2008	Visiting Scientist at **University of Chicago** (USA)
June & July 2006	Visiting Professor at **Johns Hopkins University** (Baltimore, USA)
Jan. 2005 - Mar. 2014	Associate Professor. Dept. Physics, **University of Rome** *Tor Vergata* (Italy)
Jan. 1995 - Dec. 2004	Researcher. Dept. of Physics, **University of Rome** *Tor Vergata* (Italy)
Mar. 1989 - Dec. 1989	Fellow **E**uropean **C**entre **S**cientific & **E**ngineering **C**omputing, **ECSEC**-IBM (Italy)

FELLOWSHIPS/HONOURS/AWARDS

2013-2018	**ERC** AdG NewTURB
2010	**Elected Fellow**. **EUROMECH** Society, division of *Fluid Dynamics*
2008	**Elected Fellow**. **APS**, division of *Statistical and Nonlinear Physics*
1986/87/88/89	Distinguished undergraduate student. Awarded by Acc. Nazionale dei Lincei (Italy)

TRAINING OF GRADUATE STUDENTS AND POSTDOC FELLOWS **(only those hired by me)**

PhD. Total 18. I list ongoing only: F. Milan, X. Xue, F. Guglietta, G. Goedert, L. Agasthya, V. de Toma
PostDoc. Total 16: I. Daumont, B. Devenish, A.S. Lanotte, G. Manzi, E. Foard, G. Sahoo, F. Bonaccorso, S.K. Malapaka, K. Gustafsson, M. Linkmann, M. Buzzicotti, M. De Pietro, P. Clark di Leoni, Q. Ni, R. Scatamacchia, I. Mazzitelli.

TEACHING EXPERIENCE

***Undergraduate*: Dept. Physics (DP) and Faculty Mech. Engineering (ME) U. Rome Tor Vergata**: Mathematical Methods for Physics (DP); Dynamical Systems (DP); Turbulence and Complex Fluids (ME), Quantum Mechanics (DP), Statistical Mechanics (DP), Computational Physics (DP).
***Postgraduate:* Faculty of Engineering, U. Rome La Sapienza**: Turbulence (short course, 2000); **Royal Institute of Technology Stockholm (SE):** Lagrangian and Eulerian Turbulence (short course, 2012); **Dept. Physics University Hong Kong (CN)**: Modern problems in turbulence (short course, 2003); **SUSTech (CN):** Statistical Turbulence (short course, 2019)

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Key numbers (scientific impact, Google Scholar)
Number of published papers: 230+ (2 Phys. Rep.; 1 ARFM; 1 PRX; 27 PRL; 92 JFM/PRE-PRF/PoF/JoT)
Hirsch-index (H): 48
m-index (H/# years after PhD): **1.84**
i10-index (# publications with more than 10 citations): **140+**
Citations (total): 7800+; Citations (2018): 730

MEMBER STEERING/ORGANISING COMMITTEES (last 10 years only)

- **HPC-LEAP** Conference. Cambridge, UK 2018
- **FSIM-2017**: Fluid and structures: interactions and modeling (COST meeting). Naples, Italy 2017
- HPC applications to Turbulence and Complex Flows (**HPC-LEAP School**). Rome, Italy 2016
- **FlowMat 2015** Flowing Matter Across Scales (ERC & COST meeting). Rome, Italy 2015
- Workshop on **Instantons and Extreme Events in Turbulence** (IMPA). Rio de Janeiro, Brasil 2015
- **9th European Fluid Mechanics Conference** (EFMC9). Rome, Italy 2012
- Program on **New Directions in Turbulence**. Kavli Institute of Theoretical Physics (KITPC). Beijing, Cina 2012
- **Breakup of small aggregates in turbulence** (COST meeting). Rome, Italy 2011
- **Numerical issues in Lagrangian and Eulerian Turbulence** (COST meeting). Rome, Italy 2010
- **Discrete Simulations of Fluid Dynamics** 19th, DSFD2010 Conference. Rome, Italy 2010

INSTITUTIONAL RESPONSIBILITIES (in gray those still active)

2018-2022	Supervisory Board, **European Joint Doctorate** Program STIMULATE
2014-2019	Supervisory Board, **European Joint Doctorate** Program HPC-LEAP
2014-2018	Managing Committee, **COST Action** *Flowing Matter* ESF
2017	Access Committee, **PRACE** (Partnership Advancing Computing in Europe).
2017	Scientific Board, **European Open Science Cloud for Research Pilot Projects** (EOSC).
2017-present	Scientific Board, **Italian Technion Association**
2015-present	**Executive Committee**. Dept. Physics University of *Tor Vergata*, Rome (Italy)
2014-present	**EUROMECH** Fluid Mechanics Prize and Fellow Committee
2013-present	Director, **CAST** (Inter-department Centre for Applications of Calculus to Science and Technology), Univ. *Tor Vergata,* Rome (Italy)
2013-2017	Physical Science Working Group **(European Space Agency)**
2013-2017	Steering Committee, **European High Performance Infrastructure in Turbulence**. EU
2012-2017	Scientific Committee, High Performance Computing Centre **CINECA**, Bologna (Italy)
2013-present	**Doctoral Studies Committee**, Dept. Physics Univ. *Tor Vergata*, Rome (Italy)
2008-2013	Financial Rapporteur & Managing Committee, **COST Action** *Particles in Turbulence*. ESF
2007-2009	Coordinator **ERASMUS** Project, Dept. Physics Univ. *Tor Vergata,* Rome (Italy)
2004-2009	**Euromech** board, **European Turbulence Conference**
2006-2016	National Coordinator, **Scientific Initiatives** *Particles and Fields in Turbulence* INFN (Italy)

EDITORIAL AND REVIEWING ACTIVITIES (in gray those still active)

2007-2013	Divisional Associate Editor, **Physical Review Letters** (Fluid Mechanics)
2004-present	Associate Editor, **Journal of Turbulence**
2011-present	Editorial Board, **European Journal of Physics E** (EPJE)
2018-present	Editorial Board, **Entropy**
2007-2011	Editorial Board, **European Journal of Physics B** (EPJB)

Evaluator for (only major): Italian Ministry of Research (**MIUR**), European Science Foundation (**ESF**), European Research Council (**ERC**), **US-Israel** binational science foundation. Italian Supercomputing Resources Allocations (**ISCRA**); Partnership for advanced computing in Europe (**PRACE**). **Italian-French** University. **ETH** Zurich. **Agence Nationale** de la **Recherche** (France). European Cooperation in Science and Technology (**COST**).

MEMBERSHIPS OF SCIENTIFIC SOCIETIES (only those still active)
INFN (National Institute of Nuclear Physics)**; EUROMECH** (European Mechanics Society); **APS** (American Physical Society); **ICTR** (International Centre for Turbulence Research); **CECAM** (Centre Européen de Calcul Atomique et Moléculaire)

High Performance Computing (HPC) (Only major grants <10y): ***Fractal Turbulence*** (22MH, PRACE 2012). ***Monte-Carlo methods for instantons in Turbulence*** (13MH INFN 2012). ***Multiphase systems in porous media*** (10MH PRACE 2013). ***Turbulence under Rotation*** (55MH PRACE 2014). ***Homogeneous and Anisotropic Turbulence*** (27MH PRACE 2015). ***Superfluid Turbulence under counter-flows*** (22MH PRACE 2016). ***Instantons and Intermittency in Hydrodynamic Turbulence: A Lattice Monte Carlo Approach*** (18MH PRACE 2017). **Inverse and direct cascades in rotating turbulent flows** (60MH PRACE 2018).

Editor of Special Issues (<10 y). *Discrete simulation of fluid dynamics: applications* Phil. Trans. Royal Soc. A **369**, 2384 (2011) and Phil. Trans. Royal Soc. A **369**, 2152 (2011). *Fluids and Structures, multiscale coupling and modeling.* Eur. Phys. J. E. **42**, 3 (2018). *Multi-scale phenomena in Complex Flows and flowing Matter*, Eur. Phys. J. E **39**, 56 (2016).

Invited Colloquium (C), **Plenary talks** (P), **Lectures** (L) **last 10y (>50, see web page. I list the 10 most significant).** **Nudging, Hybrid Monte Carlo, Smart particles: new tools for old problems.** Workshop on *Perspectives in Turbulence* Texas A&M 2018 (L). **Cascades in turbulent flows** (P), COST Conf. *Flowing Matter* Lisbon 2018. **Flow navigation by smart particles via Reinforcement Learning** (L), *Physics-Informed Machine-Learning* Conference, Santa Fe 2018. **Lagrangian power statistics and irreversibility in turbulence** (L), *Geometrical and Statistical Fluid Mechanics* Simons Centre workshop, Stony Brook 2017. **Anomalous scaling in turbulence with direct and/or inverse energy cascades** (L), *Turbulent Dissipation Mixing and Predictability* Workshop IPAM Los Angeles 2017. **Complex particles in complex flows** (L), *Summer School on Complex Fluids*, Twente 2016. **Convection in complex flows and boundary conditions** (L), *International Conference on Rayleigh Bénard convection*, Gottingen 2015. **Παντα ρει "Panta rei"** (C), *Multiscale Institute Colloquium*, Eindhoven 2015. **Droplets and Bubbles in Turbulence** (P), *Discrete Simulations of Fluid Dynamics* International Conference, Fargo 2011. **Caustics & Intermittency in inertial particles velocities in turbulence** (L), *International Symposium on Turbulence*, Beijing 2009.

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