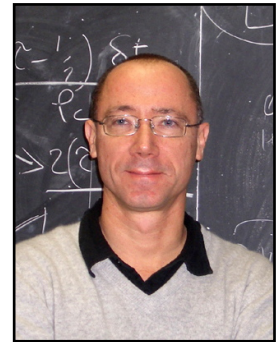


Curriculum Vitae

Prof. Luca Biferale

Born August 12, 1965, in Imperia (Italy)
Unmarried, two children (born 1996 and 2000)
Dept. Physics and CAST (Centre for Applications of Calculus to
Science and Technology)
University of Rome "Tor Vergata", Italy
email: biferale@roma2.infn.it
webpage: <http://www.fisica.uniroma2.it/~biferale/>
Spoken and written Languages: Italian, English, French



Education

Mar. 1989 Master degree in Physics, *University of Rome "Tor Vergata"*, 110/110 *cum laudem*. Title: Renormalization group study of XY and Heisenberg models in 2D.
Oct. 1993 PhD. *University of Rome "La Sapienza"*. Title: Anomalous scaling laws in fully developed turbulence.

Professional Experience

Mar. 1989 - Dec. 1989 Fellow of European Centre for Scientific and Engineering Computing (IBM, Italy)
Mar. 1993 - Dec. 1994 Postdoctoral Research Fellow "Henri Poincaré" and "Marie Curie". **Observatory of Nice** (France).
Jan. 1995 - Dec. 2004 Researcher. Dept. of Physics, **University of Rome "Tor Vergata"** (Italy).
Jan. 2005 - Mar. 2014 Associate Professor of Theoretical Physics, Mathematical and numerical modelling Dept. Physics, **University of Rome "Tor Vergata"** (Italy).
June/Jul. 2006 Visiting Professor at the "**Johns Hopkins University**" (Baltimore, USA).
Jul. 2008 Visiting Scientist at "**University of Chicago**" (USA).
Jun. 2011 & Jul. 2012 Visiting Professor at the "**Observatory of Nice**" (France).
Jan. 2011 - Dec. 2011 Visiting Professor at "**Technische University Eindhoven**" (The Netherlands).
Apr. 2014 - present Full Professor of Theoretical Physics, Mathematical and numerical modelling Dept. Physics, **University of Rome "Tor Vergata"** (Italy).

Honours and Awards

1986/87/88/89 Distinguished undergraduate student. "*Enrico Persico Prize*" awarded by Accademia Nazionale dei Lincei (Italy).
2008 **Elected Fellow**. APS, division of "Statistical and Nonlinear Physics"
2010 **Elected Fellow**. EUROMECH Society, division of "Fluid Dynamics"
2013 **ERC Advanced Grant** "New eddy-simulation concepts and methodologies for frontier problems in Turbulence".

National and International memberships

INFN (National Institute of Nuclear Physics)
CNISM (Italian National Interuniversity Consortium for the Physical Sciences and Matter)
EUROMECH (European Mechanics Society)
APS (American Physical Society)
ICTR (International Centre for Turbulence Research)
CECAM (Centre Européen de Calcul Atomique et Moléculaire, Rome node)

Key numbers about scientific impact

Number of published papers: more than 180
Hirsch-index: H = 37 (Google Scholar)
i10-index = # publications with more than 10 citations: **87** (Google Scholar)
Citations: 4300+ (Google Scholar)



Expertise

Disciplines: Physics, Applied Mathematics, Mechanical Engineering.

Applications: Turbulence, micro- and nano-fluidics, heat-transfer, non-Newtonian fluids, porous media, emulsions, colloids, kinetic methods, stochastic processes, wavelets, computational fluid mechanics, Lattice Boltzmann methods.

People management (last 10 years)

Number of Master and Bachelor students supervised in the last 10 years: **20**; Number of PhD students supervised in the last 10 years: **9**

Most significant ten publications of last 10 years (not the ten most cited)

- Shell Models of energy cascade in turbulence.
L. Biferale
Ann. Rev. Fluid. Mech. **35**, 441, 2003. **Times Cited 139**
- Multifractal statistics of Lagrangian velocity and acceleration in turbulence.
L. Biferale, G. Boffetta, A. Celani, B. Devenish, A.S. Lanotte & F. Toschi
Phys. Rev. Lett. **93**, 064502, 2004. **Times Cited 137**
- Heavy particle concentration in turbulence at dissipative and inertial scales.
J. Bec, **L. Biferale**, G. Boffetta, M. Cencini, S. Musacchio, & F. Toschi
Phys. Rev. Lett. **98**, 084502, 2007. **Times Cited 141**
- Anisotropy in turbulent flows and in turbulent transport.
L. Biferale & I. Procaccia
Phys. Rep. **414**, 43, 2005. **Times Cited 128**
- Particle trapping in three dimensional fully developed turbulence.
L. Biferale, G. Boffetta, A. Celani, A.S. Lanotte & F. Toschi
Phys. Fluids **17**, 021701, 2005. **Times Cited 122**
- Acceleration statistics of heavy particles in turbulence.
J. Bec, **L. Biferale**, G. Boffetta, A. Celani, M. Cencini, A. S. Lanotte, S. Musacchio & F. Toschi
J. Fluid Mech. **550**, 349, 2006. **Times Cited 121**
- Surface roughness-hydrophobicity coupling in microchannel and nanochannel flows
M. Sbragaglia, R. Benzi, **L. Biferale**, S. Succi & F. Toschi
Phys. Rev. Lett. **97**, 204503, 2006. **Times Cited 119**
- Mesoscopic modeling of two-phase flow in presence of boundaries: the contact angle.
R. Benzi, **L. Biferale**, M. Sbragaglia, S. Succi & F. Toschi
Phys. Rev. E **74**, 021509, 2006. **Times Cited 94**
- Universal intermittent properties of particle trajectories in highly turbulent flows.
A. Arneodo, R. Benzi, J. Berg, **L. Biferale**, E. Bodenschatz, A. Busse, E. Calzavarini, B. Castaing, M. Cencini, L. Chevillard, R.T. Fisher, R. Grauer, H. Homann, D. Lamb, A.S. Lanotte, E. Leveque, B. Luthi, J. Mann, N. Mordant, W.-C. Muller, S. Ott, N.T. Ouellette J.-F. Pinton, S.B. Pope, S.G. Roux, F. Toschi, H. Xu & P. K. Yeung
Phys. Rev. Lett. **100**, 254504, 2008. **Times Cited 69**
- Intermittency and universality in fully-developed inviscid and weakly-compressible turbulence.
R. Benzi, **L. Biferale**, R.T. Fisher, L. Kadanoff, D. Lamb & F. Toschi.
Phys. Rev. Lett. **100**, 234503, 2008. **Times Cited 42**



UNIVERSITY OF ROME "TOR VERGATA"

Funding

- 1998-2001 Head of division, project: "Development, benchmark and validation of innovative systems to observe and model the dynamics of the Mediterranean basin" (SIOMED), ENEA (Italy)
- 1998-2000 Head of division, Advanced Research Project "Turbulence and dynamical systems" INFN (Italy)
- 2000-2004 Head of Subdivision, Training and Research Network "Nonideal Turbulence" FP5, EU.
- 2002-2004 Member of "National Project on Complex Systems" MIUR (Italy).
- 2006- PI, Research Initiative "Particles and Fields in Complex Flows" INFN (Italy).
- 2006 PI, Advanced Project "Viscoelastic flows at micro- and nano-scales" CNISM (Italy).
- 2006-2008 Member of "National Project on Complex Systems" MIUR (Italy).
- 2006-2008 Head of Subdivision, STREP "Microfluidic Technologies for active Control on unconventional fluids" (INFLUS) FP6, EU.
- 2006 PI, Galileo Project "Transport and dispersion of particles in turbulence". Funded by French-Italian University.
- 2009-2011 Member of "National Project on Complex Systems". MIUR (Italy).
- 2013-2017 Head of division EuHIT "European High Performance Infrastructures in Turbulence. "Collaborative Projects and Coordination and Support Actions for Integrating Activities"
- 2013-2018 PI, ERC Advanced Grant, NewTURB "New eddy-simulation concepts and methodologies for frontier problems in turbulence" FP7, EU.
- 2013-2017 Head of subdivision project SUMA "SUpercalcolo MASSiccio" INFN-MIUR (Italy).

High Performance Computing (only major Grants)

- PI *Lagrangian turbulence* (400 Khours, Cineca, Key-project 2004).
- co-PI *Heavy particles in turbulence* (400 Khours, DEISA Extreme Computing Initiative, 2006).
- PI *Turbulence from point source* (1 Mhours, Cineca, 2009).
- PI *Boiling* (5 Mhours, DEISA Extreme Computing Initiative, 2010).
- PI *Thermal Lattice Boltzmann Methods* (100 Khours, Caspur, 2010).
- co-PI *Numerical simulations of non ideal multicomponent turbulent convection* (800 Khours, Cineca, 2010).
- co-PI *Small drops interactions with the flow in shallow cumulus clouds* (300 Khours, Cineca, ISCRA, 2012).
- co-PI *Fractal Turbulence* (22 Mhours, PRACE, 2012).
- PI *Monte-Carlo methods for instantons in Turbulence* (13 Mhours, INFN, 2012).
- co-PI *Multiphase systems in porous media* (10 Mhours, PRACE, 2013).

Editorial and Scientific Boards

- 2007-2013 Divisional Associate Editor of **Physical Review Letters** (Fluid Mechanics)
- 2004-present Associate Editor **Journal of Turbulence**
- 2011-present Editorial Board of **European Journal of Physics E** (EPJE)
- 2004-2009 Elected member of the **Euromech** board of the **European Turbulence Conference**
- 2007-2011 Editorial Board of **European Journal of Physics B** (EPJB)

Main Meetings Organization (last 10 years)

- European Science Foundation Exploratory Workshop on Lagrangian Dynamics, CastelGandolfo, Italy, 2005.
- First Italian-French meeting on Turbulence. Bagno Vignoni, Italy, 2006.
- European Science Foundation Exploratory Workshop on Microfluidics: experiments and numerics, Frascati, Italy, 2007.
- Discrete Simulations of Fluid Dynamics 19th, DSFD2010 conference. Rome, Italy, 2010.
- COST Action "Particles in Turbulence" international meeting on "Numerical issues in Lagrangian and Eulerian Turbulence". Rome, Italy 2010.
- COST Action "Particles in Turbulence" international meeting on "Breakup of small aggregates in turbulence". Rome, Italy. 2011.
- Program on "New Directions in Turbulence". Kavli Institute of Theoretical Physics China (KITPC), Beijing, Cina, 2012.

Main services to the community and science management

- 2005-2008 Member of the Executive Committee. Dept. Physics Univ. Tor Vergata. Rome (Italy)
- 2006-present National Coordinator. Scientific Initiatives "Particles and Fields in Turbulence" INFN (Italy)
- 2007-2009 Coordinator ERASMUS Project. Dept. Physics Univ. Tor Vergata Rome, Italy.
- 2008-2013 Financial Rapporteur & Managing Committee. COST Action "Particles in Turbulence". ESF
- 2010-2012 Managing Committee. HPC facility "TheoPhys". INFN (Italy)
- 2012-present Scientific Committee High Performance Computing Centre CINECA, Bologna (Italy)
- 2013-present Doctoral Studies Committee. Dept. Physics Univ. Tor Vergata. Rome (Italy)
- 2013-present Steering Committee "European High Performance Infrastructure in Turbulence" (FP7-EU)
- 2013-present Member of the "Physical Science Working Group" (European Space Agency)
- 2013-present Coordinator of CAST (Centre for Applications of Calculus to Science and Technology), Univ. Tor Vergata, Rome (Italy).
- 2014-present EUROMECH Fluid Mechanics Prize and Fellow Committee.
- 2014 Prioritisation Committee "Engineering" subpanel. PRACE (EU)
- 2014-present Managing Committee. HPC facility "Zefiro". INFN (Italy)
- 2014-present Managing Committee. COST Action "Flowing Matter" ESF.

Reviewer for:

Nature, Physical Review Letters, Physical Review E, Europhysics Letters, Physica D, Journal Fluid Mechanics, Physics of Fluids, Journal of Turbulence, New Journal of Physics, Physics Letter A. European Physical Journal B. Journal of Statistical Mechanics.

Proposal evaluation and Project Monitoring for:

Italian Ministry of Research (MIUR), European Science Foundation (ESF), European Research Council (ERC), US-Israel science foundation. Italian Supercomputing Resources Allocations (ISCRA); Partnership for advanced computing in Europe (PRACE). Italian-French University, Estonian Research Council.

Editor of Special Issues

Guest Editor:

- *Lagrangian Dynamics Special Issue* (Foreword) Journ. Turb. **8**, Issue: 35, 1 (2007);
- *Discrete simulation of fluid dynamics: applications* (Preface) Phil. Trans. Royal Soc. A **369**, 2384 (2011);
- *Discrete simulation of fluid dynamics: methods* (Preface) Phil. Trans. Royal Soc. A **369**, 2152 (2011).

Teaching Experience

Undergraduate: **Dept. Physics, U. Rome "Tor Vergata"**: Mathematical Methods for Physics; Dynamical Systems; Turbulence and Complex Fluids, Quantum Mechanics, Statistical Mechanics.

Postgraduate: **Fac. Engineering, U. Rome "La Sapienza"**: Turbulence (2000);

Royal Institute of Technology Stockholm: Lagrangian and Eulerian Turbulence (2012);

Dept. Physics University Hong Kong: Modern problems in turbulence (2003).

Invited Lectures, tutorials. (more than 50, I list the 10 most significant)

- Key-Note Speaker: *Boiling convection* "Particles in Turbulence" COST Action MP0806, Leiden (The Netherlands) 2012.
- Plenary: *Droplets and Bubbles in Turbulence*. DSFD. Fargo (USA) 2011.
- Key-Note Speaker: *Turbulent pair dispersion of inertial particles*. International Conference on Turbulence: Fundamentals, Experiments, Numerics and Applications. COST Action MP0806. Potsdam (Germany) 2011.
- *Rayleigh Taylor turbulence in stratified flows*. Turbulence and Mixing, Eilat (Israel) 2010.
- *Caustics and Intermittency in inertial particles velocities in turbulent flows*. International Symposium on Turbulence. Beijing (China) 2009.
- *Lagrangian and Eulerian Statistics with multifractals*. Isaac Newton Inst., Cambridge (UK) 2008.
- *Lagrangian scaling in Turbulence*. Int. Conf. on Non-Linear Physics, IIS Bangalore (India) 2008.



UNIVERSITY OF ROME “TOR VERGATA”

- *Lagrangian Structure Functions in Turbulence*. DFD, Minisymposium APS, Seattle (Usa) 2007.
- Tutorial: *SO(3) applied to Navier-Stokes equations*. ETC XI. Porto (Portugal) 2007.
- Plenary: *Multiphase Lattice Boltzmann for microfluidics*. DSFD, Bannf (Canada) 2007.
- Plenary: *Isotropy and Anisotropies in Turbulence*. ETC IX. Southampton (UK) 2002.