

Roberto Rusconi, Ph.D.

Massachusetts Institute of Technology
Department of Civil and Environmental Engineering
15 Vassar Street, Cambridge, MA 02139

Phone: +1 617 963 9452
Email: rrusconi@mit.edu
Webpage: rusconi.mit.edu

Education and Qualifications	Italian Scientific Qualification as Associate Professor in Experimental Condensed Matter Physics	Oct 2014
	Ph.D. Radiation Science and Technology Polytechnic University of Milan, Italy Dissertation: <i>Optical Investigation of Nonequilibrium Effects in Nanoparticle Dispersions</i> Advisor: Prof. Roberto Piazza	May 2007
	Professional Qualification for Engineers Polytechnic University of Milan, Italy	Nov 2002
	M.S. Nuclear Engineering Polytechnic University of Milan, Italy Final grade: 100/100	July 2002
Research Experience	Massachusetts Institute of Technology Postdoctoral Research Associate Department of Civil and Environmental Engineering Environmental Microfluidics Laboratory Principal Investigator: Prof. Roman Stocker	July 2010 – Present
	Harvard University Postdoctoral Research Associate School of Engineering and Applied Sciences Complex Fluids Group Principal Investigator: Prof. Howard A. Stone	Sept 2007 – June 2010
	Massachusetts Institute of Technology Visiting Researcher Department of Nuclear Science and Engineering Center for Nanofluids Technology Principal Investigator: Prof. Jacopo Buongiorno	Apr 2006 – Aug 2006
	Polytechnic University of Milan Research Assistant and Graduate Student Department of Nuclear Engineering Soft Condensed Matter Laboratory Principal Investigator: Prof. Roberto Piazza	Sept 2002 – Aug 2007

Fellowships and Awards**Teaching Fellowships Program**

for Postdoctoral Scholars at Massachusetts Institute of Technology 2014

Fondazione Angelo Della Riccia Scholarship

for Postgraduate Research at Harvard University 2007 – 2008

Fondazione Roberto Rocca Scholarship

for Graduate Research at Massachusetts Institute of Technology 2006

Italian Ministry of Education, University and Research Scholarship

for Graduate Research at Polytechnic University of Milan 2004 – 2006

SUCCESS 2002 Student Contest (2nd Prize)

A competition organized by the European Space Agency for European university students from all disciplines to propose an experiment that could fly on board the International Space Station. The prize was won with the project: *Thermal Lens Measurement of the Soret Effect*.

Teaching and Supervising Experience**Course Instructor**

Massachusetts Institute of Technology Fall 2014

Co-teaching *Course 1.000 – Computer Programming for Scientific and Engineering Applications* (second- to fourth-year undergraduate students)

Primary Course Instructor: Prof. Ruben Juanes.

Lecturer

Massachusetts Institute of Technology Fall 2014

Guest Lecturer for *Course 10.677 – Topics in Applied Microfluidics* (graduate students)

Course Instructor: Prof. Patrick Doyle.

Graduate Student Teaching Certificate Program

Spring 2013

Massachusetts Institute of Technology offers this program for graduate students and postdoctoral associates to augment their research experience with the development of their teaching skills, including exposure to relevant research in teaching and learning and opportunities to reflect on and plan their future teaching.

Mentoring

Massachusetts Institute of Technology 2010 – 2013

Supervised students (seven) on thesis and research projects.

Harvard University 2007 – 2010

Supervised students (three) on thesis and research projects.

Polytechnic University of Milan 2004 – 2007

Advised students (four) on thesis and research projects.

Tutoring

Polytechnic University of Milan 2004 – 2007

Math and Physics for undergraduate students.

Publications

Peer-Reviewed Journals

Citations: 797, *h*-index: 14 (Source: Google Scholar, December 2014)

(* denotes equal contribution)

22. **Rusconi R**, Stocker R. 2015. Microbes in flow. *Current Opinion in Microbiology*, In Press.
21. **Rusconi R**, Guasto JS, Stocker R. 2014. Bacterial transport suppressed by fluid shear. *Nature Physics* 10:212–217.
20. **Rusconi R**, Garren M, Stocker R. 2014. Microfluidics Expanding the Frontiers of Microbial Ecology. *Annual Review of Biophysics* 43:65–91.
19. Garren M, Son K, Raina JB, **Rusconi R**, Menolascina F, Shapiro OH, Tout J, Bourne DG, Seymour JR, Stocker R. 2014. A bacterial pathogen uses dimethylsulfoniopropionate as a cue to target heat-stressed corals. *The ISME Journal* 8:999–1007.
18. Billings N, Ramirez Millan M, Caldara M, **Rusconi R**, Terasova Y, Stocker R, Ribbeck K. 2013. The extracellular matrix component Psl provides fast-acting antibiotic defense in *Pseudomonas aeruginosa* biofilms. *PLoS Pathogens* 9:1–12.
17. Guasto JS, **Rusconi R**, Stocker R. 2012. Fluid mechanics of planktonic microorganisms. *Annual Review of Fluid Mechanics* 44:373–400.
16. **Rusconi R**, Lecuyer S, Autrusson N, Guglielmini L, Stone HA. 2011. Secondary flow as a mechanism for the formation of biofilm streamers. *Biophysical Journal* 100:1392–1399.
15. Lecuyer S*, **Rusconi R***, Shen Y, Forsyth A, Vlamakis H, Kolter R, Stone HA. 2011. Shear stress increases the residence time of adhesion of *Pseudomonas aeruginosa*. *Biophysical Journal* 100:341–350.
14. Guglielmini L, **Rusconi R**, Lecuyer S, Stone HA. 2011. Three-dimensional features in low-Reynolds-number confined corner flows. *Journal of Fluid Mechanics* 668:33–57.
13. Autrusson N, Guglielmini L, Lecuyer S, **Rusconi R**, Stone HA. 2011. The shape of an elastic filament in a two-dimensional corner flow. *Physics of Fluids* 23:063602.
12. **Rusconi R***, Lecuyer S*, Guglielmini L, Stone HA. 2010. Laminar flow around corners triggers the formation of biofilm streamers. *Journal of the Royal Society Interface* 7:1293–1299.
11. Vigolo D, **Rusconi R**, Stone HA, Piazza R. 2010. Thermophoresis: microfluidics characterization and separation. *Soft Matter* 15:3489–3493.
10. Vigolo D, **Rusconi R**, Piazza R, Stone HA. 2010. A portable device for temperature control along microchannels. *Lab on a Chip* 10:795–798.
9. Eapen J, **Rusconi R**, Piazza R, Yip S. 2010. The Classical Nature of Thermal Conduction in Nanofluids. *Journal of Heat Transfer* 132:102402.

8. **Rusconi R**, Stone HA. 2008. Shear-Induced Diffusion of Platelike Particles in Microchannels. *Physical Review Letters* 101:254502.
7. Buzzaccaro S, Tripodi A, **Rusconi R**, Vigolo D, Piazza R. 2008. Kinetics of sedimentation in colloidal suspensions. *Journal of Physics: Condensed Matter* 20:494219.
6. Buzzaccaro S, **Rusconi R**, Piazza R. 2007. Sticky Hard Spheres: Equation of State, Phase Diagram, and Metastable Gels. *Physical Review Letters* 99:098301.
5. Eapen J, Williams WC, Buongiorno J, Hu LW, Yip S, **Rusconi R**, Piazza R. 2007. Mean-Field Versus Microconvection Effects in Nanofluid Thermal Conduction. *Physical Review Letters* 99:095901. Selected also for the *Virtual Journal of Nanoscale Science & Technology* 16.
4. **Rusconi R**, Williams WC, Buongiorno J, Piazza R, Hu LW. 2007. Numerical Analysis of Convective Instabilities in a Transient Short-Hot-Wire Setup for Measurement of Liquid Thermal Conductivity. *International Journal of Thermophysics* 28:1131–1146.
3. **Rusconi R**, Rodari E, Piazza R. 2006. Optical measurements of the thermal properties of nanofluids. *Applied Physics Letters* 89:261916. Selected also for the *Virtual Journal of Nanoscale Science & Technology* 15.
2. Iacopini S, **Rusconi R**, Piazza R. 2006. The ‘macromolecular tourist’: Universal temperature dependence of thermal diffusion in aqueous colloidal suspensions. *European Physical Journal E* 19:59–67.
1. **Rusconi R**, Isa L, Piazza R. 2004. Thermal-lensing measurement of particle thermophoresis in aqueous dispersions. *Journal of the Optical Society of America B* 21:605–616.

Contributed Talks

<i>Bacterial turbulence in motion</i>	
Annual Meeting of the American Physical Society	
Division of Fluid Dynamics (APS-DFD), San Francisco CA, USA	Nov 2014
<i>Shear trapping of motile bacteria: microfluidic experiments and mathematical modeling</i>	
1 st International Conference on Micro & Nanofluidics	
University of Twente, The Netherlands	May 2014
<i>Bacterial trapping in shear</i>	
APS-DFD, San Diego CA, USA	Nov 2012
<i>Bacterial motility and chemotaxis in shear</i>	
APS-DFD, Baltimore MD, USA	Nov 2011
<i>Curved microchannels and bacterial streamers</i>	
American Physical Society March Meeting, Portland OR, USA	Mar 2010
<i>Bacterial streamers in curved microchannels</i>	
APS-DFD, Minneapolis MN, USA	Nov 2009

	<i>Shear-induced diffusion of plate-like particles in microchannels</i> APS-DFD, San Antonio TX, USA	Nov 2008
	<i>Microfluidic Experiments of the Shear-Induced Diffusion of Disk-Shaped Particles</i> American Chemical Society Colloid & Surface Science Symposium, Raleigh NC, USA	June 2008
	<i>Numerical simulation and experimental setup for thermal-lensing measurements of particle thermophoresis</i> International Meeting on Thermodiffusion (IMT6), Varenna, Italy	July 2004
Invited Seminars	<i>Shear trapping of motile cells</i> 7th World Congress of Biomechanics, Boston MA, USA	July 2014
	<i>Bacteria against the flow</i> Massachusetts Institute of Technology, Cambridge MA, USA	Nov 2012
	<i>How to form biofilm streamers in a microfluidic channel</i> Massachusetts Institute of Technology, Cambridge MA, USA	Sept 2009
Professional Activities	Co-organizer <i>International Conference on Optofluidics</i> SPIE Optics and Photonics, San Diego CA, USA	Aug 2010
	<i>Symposium on “Biofilms and Multicellularity”</i> American Physical Society March Meeting Portland OR, USA	Mar 2010
	<i>International Meeting on Thermodiffusion</i> Varenna, Italy	July 2004
	Co-editor <i>New Journal of Physics</i> Focus Issue in “Physics of Biofilms”	Mar 2013 – Present
	Peer Reviewer <i>Physical Review Letters, Physical Review E, Physical Review Applied, New Journal of Physics, Journal of the Royal Society Interface, The ISME Journal, Biotechnology and Bioengineering.</i>	
Computer Skills	Programming and computing languages: <i>C++, Matlab, Mathematica.</i> Numerical solving routines: <i>Comsol, Fluent, FlexPDE.</i>	
Languages	English (fluent) Italian (native speaker)	

References

Prof. Roman Stocker

Associate Professor in Civil and Environmental Engineering
Massachusetts Institute of Technology
Building 48, Room 213, 15 Vassar Street, Cambridge, MA 02139, USA
Phone: +1 617 253 3726
Email: romans@mit.edu

Prof. Howard A. Stone

Donald R. Dixon 69 and Elizabeth W. Dixon Professor
in Mechanical and Aerospace Engineering
Princeton University
D328 Engineering Quadrangle, Princeton, NJ 08544, USA
Phone: +1 609 258 9493
Email: hastone@princeton.edu

Prof. Roberto Piazza

Full Professor in Condensed Matter Physics
Polytechnic University of Milan
Edificio 19, via Ponzio 34/3, 20133 Milano, Italy
Phone: +39 02 2399 6386
Email: roberto.piazza@polimi.it

Prof. Ruben Juanes

ARCO Associate Professor in Energy Studies
Massachusetts Institute of Technology
Building 48, Room 319, 15 Vassar Street, Cambridge, MA 02139, USA
Phone: +1 617 253 7191
Email: juanes@mit.edu

Prof. Jacopo Buongiorno

Associate Professor of Nuclear Science and Engineering
Massachusetts Institute of Technology
Building 24, Room 206, 77 Massachusetts Avenue, Cambridge, MA 02139, USA
Phone: +1 617 253 7316
Email: jacopo@mit.edu