

Dr. Michele Guala

Curriculum Vitae

(As of April 2011)

Personal Information

Name: Michele Guala
Title: Assistant Professor, Department of Civil Engineering (CE),
St. Anthony Falls Laboratory (SAFL), University of Minnesota
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Education

2003 Ph.D. Hydraulic Engineering, University of Padova, Italy
Experiments on coherent structures in turbulence
Supervisor: Seminara G. (University of Genova), Co-advisors:
Adrian R.J. and Garcia M.H. (University of Illinois at Urbana Champaign)

1998 Laurea (Master) in Civil and Environmental Engineering, University of Genova, Italy
Effects of the curvature on the morphodynamics of an erodible bed channel
Supervisor: Seminara G.

Working Experiences

Jan 11 – Now Assistant Professor at Civil Eng. & St. Anthony Falls Laboratory,
UMN, Minneapolis, MN, USA

Feb 08 – Oct 10 Postdoctoral scholar in Aeronautics,
Graduate Aerospace Laboratories GALCIT, Caltech, Pasadena, CA, USA

Jan 07 – Dec 07 Research scientist at the Swiss Fed. Inst. for Snow and Avalanche Res. SLF,
Davos, Switzerland

May 03 – Dec 06 Postdoctoral fellow at the Institute of Hydromechanics and Water Res.
ETH Zurich, Switzerland

Apr 99 – Mar 03 PhD student, Environmental Engineering Department
University of Genova, Italy

May 01 – Sept 01 and
Apr 02 – Aug 02 Visiting scholar at the Laboratory of Turbulence and Complex Flows
Department of Theoretical and Applied Mechanics
University of Illinois at Urbana Champaign (USA)

May 00 – May 01 Visiting scholar at the Hydrosystem Laboratory
Department of Civil and Environmental Engineering
University of Illinois at Urbana Champaign (USA)

Research areas of interest

Environmental fluid mechanics, renewable energies, near-surface processes in geophysical flows (atmospheric surface layer, rivers, flows over rough and complex terrain), snow and sediment transport, particles turbulence interaction, multiphase flows, experimental methods in fluid mechanics, vortex dynamics.

Member of:

American Physical Society (APS)
American Geophysical Union (AGU)
Euromech Society

Referee for journals

Experiments in fluids
Journal of Fluid Mechanics
Journal of Hydraulic Engineering
Journal of Turbulence
Physics of fluids

Invited presentations

- “Snow roughness, aggregation and saltation”, Geomechanics seminar, Civil Engineering, UMN, (2011).
- “On the structure of the high Reynolds number turbulent boundary layer”, Mechanical and Aeronautic Engineering, ASU, Tucson, AZ, (2010)
- “Key scales and mechanisms in geophysical multiphase flows”, Civil Engineering, University of Minnesota, Minneapolis, MN, (2010)
- “Scale Interactions in the high Reynolds number turbulent boundary layer”, Mechanical and Aeronautical Engineering, University of Notre Dame, Notre Dame, IN, (2010)
- “Particles turbulence interaction” COST Workshop, ETH Zurich, Switzerland (2009)
- “Key scales and mechanisms in fluid particle systems” Mechanical Engineering colloquium, Caltech, Pasadena, CA (2008)
- “On strain and vorticity dynamics in homogeneous turbulence”, TU Delft, the Netherlands (2006)
- “On the different evolution of material lines and vorticity in homogeneous turbulence”, DIAM, University of Genova, Italy (2006)
- “On the small scale vorticity dynamics in homogeneous turbulence”, Polytechnic of Torino, Italy (2006)
- “Coherent structures in the rough wall turbulent boundary layer”, ETH Zurich, Switzerland (2003)

List of publications

- Guala** M., Metzger M. and McKeon B. “Scale interactions across the wall layer”, *J. Fluid Mech.* 666 (573-604), 2011.
- Guala** M. Metzger M., and McKeon B.J. “Intermittency in the atmospheric surface layer: Unresolved or slowly varying ?” *Physica D*, 239(14) (1251-1257), 2010.
- Holzner M., **Guala** M., Luthi B., et al. “Viscous tilting and production of vorticity in homogeneous turbulence”, *Phys. of fluids*, 22(6), (061701), 2010.
- Stoessel F., Manes C., **Guala** M., Fierz C.. and A. Lehning M. “Micrometeorological and morphological observations of surface hoar dynamics on a mountain snow cover” *Water Res Research*, 46 (W04511), 2010.
- Liberzon A., Holzner **Guala** M., Luthi B., Kinzelbach W. “On turbulent entrainment in a dilute polymer solution.” *Phys. of fluids*, 21(3) (035107), 2009.
- Guala** M., Liberzon A., Hoyer K., Kinzelbach W., Tsinober A. “Experimental study on clustering of large particles in homogeneous turbulent flow” *Journal of Turbulence*, 9(34) (1-20), 2008.
- Boutsianis V., **Guala** M., Olgac U., Wildermuth S., Ventikos V., Hoyer K., Poulikakos D., “CFD and PTV Steady Flow Investigation in an Anatomically Accurate Abdominal Aortic Aneurysm.” *Journal of Biomechanical Engineering*, 131(1) (011008), 2009.
- Guala** M., Manes C., Clifton A., Lehning M. “A wind tunnel investigation on the saltation of fresh snow particles in a turbulent boundary layer: profile characterization and single particle statistics” *Journal of Geophysical Research - Earth*, 113(F3) (F03024), 2008.
- Manes C., **Guala** M., Egli L., Loewe H. and A. Lehning M. “Statistical property of fresh snow roughness”: *Water Res. Research.* 44(11) (W11407), 2008.
- Loewe H., Egli L., Bartlett S., **Guala** M., Manes M., “On the evolution of snow surface during snowfall” *Geophys. Res. Lett.*, 34(21) (L21507), 2007.
- Clifton A., Manes C., Ruedi J.D., **Guala** M., Lenhing M., “On shear driven ventilation of snow” *Boundary Layer Meter.*, 126(2) (249-261), 2007.
- Guala** M. & Stocchino A. “Large scale flow structures in particle-wall collision at low Deborah numbers”, *European Journal of Mechanics - B/Fluids*, 26(4) (511-530), 2007.
- Guala** M., Liberzon A., Tsinober A. and Kinzelbach W. “An experimental investigation on Lagrangian correlations of small scale turbulence at low Reynolds number”, *J. Fluid Mech.*, 574 (405-427), 2007.
- Guala** M., Liberzon A., Luethi B., Tsinober A. and Kinzelbach W. “Stretching and tilting of material lines in turbulence: The effect of vorticity and strain”, *Physical Review E*, 73 (036303), 2006.
- Guala** M., Hommema S.E and Adrian R.J., “Large-scale and very-large-scale motions in turbulent pipe flow”, *J. Fluid Mech.*, 554 (521-542), 2006.
- Liberzon A., **Guala** M., Kinzelbach W., Tsinober A. “On turbulent kinetic energy production and dissipation in dilute polymer solutions”, *Phys of fluids*, 18 (125101), 2006.

Holzner M., Liberzon A., **Guala** M., Tsinober A. and Kinzelbach W. “Generalized detection of a turbulent front generated by an oscillating grid”, *Exp. In fluids*, 41(5) (711-719) , 2006.

Hoyer K., Holzner M., Luethi B., **Guala** M., Liberzon A., Kinzelbach W. “A scanning technique for 3D particle tracking velocimetry”, *Exp. In Fluids*, 39(5) (923-934), 2005.

Liberzon A., Luethi B., **Guala** M., Kinzelbach W., Tsinober A., “Turbulence production in Convection and shear flows”, *Phys. of fluids*, 17(9) (095110-1), 2005.

Guala M., Luethi B., Liberzon A., Kinzelbach W., Tsinober A. “On the evolution of vorticity and material lines in homogeneous turbulence”, *J. Fluid Mech.*, 533 (339-359), 2005.

Liberzon A., **Guala** M., Luethi B., Kinzelbach W., Tsinober A. “Turbulence in dilute polymer solution”, *Phys. of fluids*, 17(3) (031707), 2005.

Zolezzi G., **Guala** M., Termini D., Seminara G. “Experimental observations of upstream overdeepening”, *J. Fluid Mech.*, 531 (191-219), 2005.

Stocchino A. & **Guala** M. “Particle wall collision in Newtonian and non Newtonian fluids”, *Exp. in fluids*, 38(4) (476-484), 2005.

Other contributions:

LeHew J.,**Guala** M., McKeon B. J. “A study of convective velocities in a zero pressure gradient turbulent boundary layer” AIAA-2010-4474.

Jacobi I., **Guala**, M., McKeon B. J. “Characteristics of a turbulent boundary layer perturbed by spatially-impulsive dynamic roughness” AIAA-2010-4475.

Guala M., Liberzon A., Hoyer K., Kinzelbach W., Tsinober A. “Simultaneous measurements of the fluid and the solid phases in homogeneous turbulence” in *Particle-Laden Flows*, Geurts, Clerks, Uittewald Eds. Springer, 2007.

Liberzon A., Luethi B., **Guala** M., Kinzelbach W., Tsinober A. “On anisotropy of turbulent flow in regions of negative eddy viscosity ” in *Progress in Turbulence II*, Springer, 2007.

K. Hoyer, M. Holzner, M. **Guala**, W. Kinzelbach ”Simultaneous 3D-flow field and compliant wall measurements in an abdominal aortic aneurysm flow using scanning-PTV” *Proceedings of th V Symposium 'Image Engineering and Vision Meteorology'* Dresden, Germany (2006)Editors: H.-G. Maas, D. Schneider

Guala M., Christensen K.T., Adrian R.J., “Effect of a roughness transition on turbulent structures in the outer layer”, *Sedimentation and Sediment transport*, Kluwer Acad. Pub., Sept 2002.