
ALFREDO SOLDATI BRIEF CURRICULUM VITÆ¹

May 2015

PERSONAL DETAILS

Date and Place of Birth: May 30 1963; Livorno;
Citizenship: Italian;
Military Duty: National Fire Brigades, Volunteer, May 2 1990 – April 30 1991;
Family: Married, Two children;

ACADEMIC BACKGROUND

1993: Dottorato di Ricerca (PhD) in Chemical Engineering, Università di Pisa, Italia
1989: Laurea (BS and MS) in Nuclear Engineering, Università di Pisa, Italia
1982: Maturità Classica, Liceo-Ginnasio Niccolini e Guerrazzi, Livorno, Italia

ACADEMIC POSITIONS

2010 –: Professor, Chair of Fluid Mechanics, Università di Udine
2007 – 2010: Professor, Chair of Chemical Plant Design, Università di Udine
2002 – 2006: Associate Professor, Chemical Plant Design, Università di Udine
1993 – 2002: Ricercatore, Chemical Plant Design, Università di Udine
1991 – 1995: Research Assistant/Associate, Dept. Chem. Eng. University of California at Santa Barbara

HONORS AND AWARDS

Chairman of the 9th International Conference on Multiphase Flows, 2016, Firenze, Italy.
Lewis F. Moody Award, 2015, American Society of Mechanical Engineers, Fluids Engineering Division.
Fellow of the American Physical Society (Elected 2013).
Professore Invitato, Scuola Superiore Sant'Anna, Pisa (2013).
Professeur Invité, Inst. National Polytechnique, Toulouse (2011).
Professeur Invité, Ecole Polytechnique Federale de Lausanne, Lausanne (2008).
Robert T. Knapp Award, 2007 American Society of Mechanical Engineers, Fluids Engineering Division.

INVITED PLENARY AND KEYNOTE LECTURES

Keynote Speaker 4th Int. Conf. on Turbulence and Interactions, Cargèse, Corsica, Nov 2-6, 2015.
Plenary Speaker 3rd Polish Congress of Mechanics, Gdansk, Poland, Sept. 8-11, 2015.
Keynote Speaker Int. Symp. on Turbulence and Shear Flow Phenomena, Melbourne, Australia, Jun 30 Jul 3, 2015.
Plenary Talk International Conference on Numerical Methods for Multiphase Flow, Darmstadt, DE, Jun 30 Jul 2, 2014.
Keynote Lecture *Particles in Turbulence*, Eindhoven, NL, July 1 - 5, 2013.
Keynote Lecture *Direct and Large-Eddy Simulation. ERCOFTAC*, Dresden, DE, April 3 - 5, 2013.
Semi-Plenary Lecture *ECCOMAS*, Wien (AT) 12-14 September 2012.
Keynote Lecture *Symposium on Multiphase Flow and Transport Phenomena*, Agadir, MO, April 22-25 2012
Keynote Lecture *International Conference on Multiphase Flow 2010*, Tampa, (FL) USA.
Keynote Lecture, 7th Italian Conference on Chemical and Process Engineering, Giardini-Naxos (IT).
Plenary Lecture 2004 Conference of *Gesellschaft für Angewandte Mathematik und Mechanik*, Dresden (DE).

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SPECIAL APPOINTMENTS

- 2010 – : Deputy Secretary General, International Center for Mechanical Sciences, Udine
2014 – : Associate Editor *ASME Journal of Fluids Engineering*.
2005 – : Editor *Acta Mechanica*.
2011 – : Chairman of the Working Party Multiphase Flow, *European Federation of Chemical Engineering*.
2013 – 2014: Guest Editor *Advances in Water Research*, S.I. THESIS, **72**, 2015.
2012 – 2013: Guest Editor *Acta mechanica* S.I. *Anisotropic Particles in turbulent flows*, **224**, (2013).
2011 – 2012: Guest Editor *Advances in Water Research*, S.I. THESIS, **48**, (2012).
2013 – 2014: Guest Editor *Acta mechanica* S.I. to Prof. Wilhelm Schneider, **201**, (2008).
2010 – : Editorial Advisory Board *International Journal of Multiphase Flow*.

ACADEMIC AND PROFESSIONAL SERVICES

- 2014 – : University Vice-Provost for Sport Activities
2011 – : Director, Doctoral Program in Env. & Energy Eng. Sciences, Università di Udine
2008 – 2016: Member, Administrative Board of LOD Srl.
2007 – : Founder and Shareholder of LOD Srl, SpinOff of the University of Udine.

JOURNAL PUBLICATIONS - FROM ISI WOS MAY 2015: 90 PAPERS, H-INDEX = 21

93. N. Pettarin, M. Campolo and A. Soldati (2015) “Short term prediction of odor dispersion in urban environment”, *Atmospheric Environment*, (In Press).
92. F. Zonta, A. Soldati and M. Onorato (2015) “Gravity-capillary waves growth and spectra in countercurrent air/water turbulent flow”, *J. Fluid. Mech.*, **770**, —.
91. L. Scarbolo, F. Bianco, and A. Soldati (2015) “Coalescence and breakup of large droplets in turbulent channel flow”, *Phys. Fluids*, **27**, 073302.
90. C. Marchioli, and A. Soldati (2015) “Turbulent breakage of ductile aggregates”, *Phys. Rev. E* **91**, 053003.
89. L. Scarbolo and A. Soldati (2015) “Wall drag modification by large deformable droplets in turbulent channel flow”, *Computers & Fluids* **113**, 87-92.
88. N. Aksel, H. Irschik, A. Soldati, G. J. Weng, F. Ziegler (2015) “Review and perspective in mechanics”, *Acta Mechanica* **226**, 977.
87. M. Campolo, M. Simeoni, R. Lapasin, A. Soldati (2015) “Turbulent drag reduction by bio-polymers in large scale pipes”, *ASME J. Fluids Eng.* 137(4), 041102.
86. S. Lovecchio, F. Zonta, and A. Soldati (2015) “Upscale energy transfer and flow topology in free surface turbulence”, *Phys. Rev. E* **91**, 033010.
85. M. Bähler, L. Biferale, L. Brandt, U. Feudel, K. Guseva, A. Lanotte, C. Marchioli, F. Picano, G. Sardina, A. Soldati, F. Toschi (2015) “Numerical simulations of aggregate breakup in bounded and unbounded turbulent flows”, *J. Fluid. Mech.* **766**, 104-128.
84. A. Capone, G.P. Romano, A. Soldati (2015) “Experimental investigation on interactions among fluid and rod-like particles in a turbulent pipe jet by means of Particle Image Velocimetry” *Exp. Fluids* **56:1**.
83. K.D. Nguyen, J. T. Jenkins & A. Soldati (2014) “Preface to Symposium THESIS-2013: Two-Phase Modeling of Sediment Dynamics”, *Adv. Wat. Res.* **72**, 1-2.
82. S. Lovecchio, F. Zonta and A. Soldati (2014) “Influence of thermal stratification on the surfacing and clustering of floaters in free surface turbulence”, *Adv. Wat. Res.* **72**, 22-31.
81. C. Bosshard, A. Dehbi, M. Deville, E. Leriche, R. Puragliesi and A. Soldati (2014) “Large eddy simulation of particulate flow inside a differentially heated cavity”, *Nucl. Eng. & Des.* **267**, 154-163.
80. C. Marchioli, M.V. Salvetti, S. Chibbaro and A. Soldati (2014) “Conditional Lagrangian error in *a priori* Large Eddy Simulation of particles in turbulent bounded flows”, *J. of Turbulence* **15**, Vol. 1, 22-33.
79. F. Zonta and A. Soldati (2014) “Effect of temperature dependent fluid properties on heat transfer in turbulent mixed convection”, *ASME J. Heat Transfer* **136**, 022501.
78. L. Scarbolo and A. Soldati (2013) “Turbulence modulation across the interface of a large deformable drop”, *J. of Turbulence* **14**, Vol. 11, 27-43.
77. S. Lovecchio, C. Marchioli and A. Soldati (2013) “Time persistency of floating particle clusters in free-surface turbulence” *Phys. Rev. E* **88**, 033003.
76. F. Zonta, C. Marchioli and A. Soldati (2013) “Turbulence, particle dynamics and deposition in swirled pipe flow”, *Int. J. Multiphase Flow* **56**, 172-183.
75. H.I. Andersson and A. Soldati (2013) “Anisotropic particles in turbulence: Status and Outlook”, *Acta Mechanica* **224**, 2219-2223.

74. C. Marchioli and A. Soldati (2013) "Rotation statistics of fibers in wall shear turbulence", *Acta Mechanica* **224**, 2311-2329.
73. C. Bosshard, A. Dehbi, M. Deville, E. Leriche, R. Puragliesi and A. Soldati (2013) "Large eddy simulation of the differentially heated cubic cavity flow by the spectral element method" *Computers & Fluids* **86**, 210-227
72. Campolo, M. Curcio, F. and A. Soldati (2013) "Minimal perfusion flow for osteogenic growth of mesenchymal stem cells on lattice scaffolds", *AIChE J.* **59**, 3131-3144.
71. A. Capone, A. Soldati and G.P. Romano (2013) "The effect of Reynolds number on mixing and entrainment of turbulent round jets", *Exp. Fluids* **54**, art. no. 1434.
70. S. S. Dearing, M. Campolo, A. Capone, and A. Soldati (2013) "Phase discrimination and object fitting to measure fibers distribution and orientation in turbulent pipe flows", *Exp. Fluids* **54**, art. no. 1419.
69. L. Scarbolo, M. Sbragaglia, P. Perlekar, D. Molin, A. Soldati, F. Toschi (2013) "Unified framework for a side-by-side comparison of different multicomponent algorithms: lattice Boltzmann vs. phase field model", *J. Comp. Phys.* **239**, 263-279.
68. K.D. Nguyen, J. T. Jenkins & A. Soldati (2012) "Preface to Symposium THESIS-2011: Two-Phase Modeling of Sediment Dynamics", *Adv. Wat. Res.*, **48**, 1.
67. A. Soldati & C. Marchioli (2012) "Sediment transport in steady turbulent boundary layers: Potentials, limitations, and perspectives for Lagrangian tracking in DNS and LES", *Adv. Wat. Res.*, **48**, 18-30.
66. E. Pitton, C. Marchioli, V. Lavezzo, A. Soldati and F. Toschi (2012) "Anisotropy in Pair Dispersion of Inertial Particles in Turbulent Channel Flow", *Phys. Fluids*, **24**, 073305.
65. F. Zonta, M. Onorato and A. Soldati (2012) "Turbulence and internal waves in stably-stratified channel flow with temperature-dependent fluid properties", *J. Fluid Mech* , **697**, 175-203.
64. F. Bianco, C. Marchioli, M.V. Salvetti, S. Chibbaro and A. Soldati (2012) "Intrinsic sub-grid scale error in a priori Large Eddy Simulation of particles in turbulent bounded flows", *Phys. Fluids*, **24**, 045103 (Cover).
63. F. Zonta, C. Marchioli and A. Soldati (2012) "Modulation of forced convection turbulent flow by anisotropic temperature-dependent viscosity", *J. Fluid Mech.*, **697**, 150-174.
62. Molin, D., C. Marchioli and A. Soldati (2012) "Direct numerical simulation of momentum-coupled turbulent bubbly flow in vertical channel", *Int. J. Multiphase Flow*, **42**, 8095.
61. Campolo, M., Molin, D., N. Rawal, and A. Soldati (2012) "Protocols to compare infusion distribution of wound catheters" , *Medical Eng. & Phys*, **34**, 326 332.
60. R. Puragliesi, A. Dehbi, E. Leriche, A. Soldati & M.O. Deville (2011) "DNS of buoyancy driven flows and Lagrangian particle tracking in a square cavity at high Raileigh numbers", *Int. J. Heat & Fluid Flow*, **32**, 915-931
59. F. Zonta, C. Marchioli and A. Soldati (2011) "Time behavior of heat fluxes in thermally-coupled dispersed particle flows", *Acta Mechanica*, **218** 367-373.
58. A. Soldati, M. Campolo, F. Sbrizzai (2010) "Modeling nano-particle deposition in diesel engine filters", *Chem. Eng. Sci.*, **65** 64436451.
57. Lavezzo, V., Soldati, A., Geraschenko, S., Waarhaft, Z. and L. Collins (2010) "On the role of gravity and shear on inertial particle accelerations in near-wall turbulence", *J. Fluid Mech.*, **658** 229-246.
56. Marchioli, C., Fantoni, M. and A. Soldati (2010) "Influence of wall turbulence on orientation, dispersion and deposition of elongated fibers", *Phys. Fluids*, **22**, 033301.
55. R. IJzermans, M.W. Reeks, E. Meneguz, M. Picciotto and A. Soldati (2009) "Measuring segregation of inertial particles in turbulence by full Lagrangian approach" *Phys. Rev. E*, **80**, 015302.
54. A. Soldati and C. Marchioli (2009) "Physics and modelling of turbulent particle deposition and entrainment: review of a systematic study", *Int. J. Multiphase Flow*, **35**, 827-839 (Invited Paper).
53. M. Campolo, M. Andreoli and A. Soldati (2009) "Computation of reacting turbulent flow in an aerospace micro-rocket" *Microfluidics and Nanofluidics*, **6**, 881-898.
52. V. Lavezzo, R. Verzicco and A. Soldati (2009) "Ekman pumping and intermittent particle resuspension in a Direct Numerical Simulation of an unbaffled stirred tank" *Chem. Eng. Res. Des.* **87**, 557-564.
51. F. Sbrizzai, R. Verzicco and A. Soldati (2009) "Turbulent flow and dispersion of inertial particles in a confined jet issued by a long cylindrical pipe", *Flow Turb. & Combustion*, **82**, 1-23.
50. Aksel, Nuri, Soldati, Alfredo, & Steinrueck, Herbert (2008) "Dedication", *Acta Mech.*, **201**, 1-2
49. C. Marchioli, M.V. Salvetti and A. Soldati (2008) "Appraisal of Energy Recovering Sub-grid Scale Models for Large Eddy Simulation of Turbulent Dispersed Flows", *Acta Mech.*, **201**, 277-296 (Invited Paper).
48. C. Marchioli, A. Soldati, J.G.M. Kuerten, B. Arcen, A. Tanière, G. Goldensof, K.D. Squires, M.F. Cargnelli and L.M. Portela (2008) "Statistics of particle dispersion in Direct Numerical Simulations of wall-bounded turbulence: results of an international collaborative benchmark test", *Int. J. Multiphase Flow*, **34**, 879-893.
47. M. Campolo, A. Cremese and A. Soldati (2008) "Controlling particle dispersion in a transverse jet by synchronized injection", *AIChE J.*, **54**, 1975-1986.

46. C. Marchioli, M.V. Salvetti and A. Soldati (2008) "Some issues concerning Large-Eddy Simulation of inertial particle dispersion in turbulent bounded flows", *Phys. Fluids*, **20** 040603.
45. F. Zonta, C. Marchioli and A. Soldati (2008) "Direct Numerical Simulation of Turbulent Heat Transfer Modulation in Micro-Dispersed Channel Flow," *Acta Mech.*, **195** 305-326 (Invited Paper).
44. M. Campolo, M. Andreoli, L. Tognotti and A. Soldati (2007) "Modelling of a multiphase reacting turbulent jet: application to supersonic carbon injection in siderurgic furnaces", *Chem. Eng. Sci.*, **62** 4439-4458.
43. C. Marchioli, M. Fantoni and A. Soldati (2007) "Influence of added mass on high rise velocity of light particles in cellular flow field: A note on the paper of Maxey (1987)" *Phys. Fluids* **19** 098101
42. C. Marchioli, V. Armenio and A. Soldati (2007) "Simple and accurate interpolation scheme for particle tracking in curvilinear grids", *Computers and Fluids*, **36**, 1187-1198.
41. C. Marchioli, M. Picciotto and A. Soldati (2007) "Influence of gravity on particle wall segregation in vertical/horizontal turbulent channel flows", *Int. J. Multiphase Flow*, **32**, 227-251.
40. M. Picciotto, C. Marchioli, and A. Soldati (2006) "Lagrangian Timescale and Statistics for particle dispersion in wall bounded flows" *J. of Turbulence*, **7**, N60.
39. C. Marchioli, M.V. Salvetti, E. Armenio, and A. Soldati (2006) "Mechanisms for deposition and resuspension of particles in turbulent flow over wavy interfaces", *Phys. Fluids*, **18** Art.025102.
38. F. Sbrizzai, V. Lavezzo, R. Verzicco, M. Campolo and A. Soldati (2006) "DNS of Turbulence Dispersion of Inertial Particles in a Stirred Tank Reactor", *Chem. Eng. Sci.*, **61**, 2843-2851.
37. M. Picciotto, C. Marchioli and A. Soldati (2005) "Characterization of near-wall accumulation regions for inertial particles in turbulent boundary layers", *Phys. Fluids*, **17** Art.098101.
36. F. Sbrizzai, E. Faraldi, and A. Soldati (2005) "Appraisal of 3D Numerical Simulation for sub-micron particle behavior in a microporous ceramic filter", *Chem Eng Sci.*, **60**, 6551-6563.
35. A. Giusti, F. Lucci, and A. Soldati (2005) "Influence of the lift force in direct numerical simulation of upward/downward turbulent channel flow laden with surfactant contaminated microbubbles," *Chem Eng. Sci.*, **60**, 6176-6187.
34. M. Campolo, G.M. Degano, L. Cortelezzi, and A. Soldati (2005) "Influence of Jet Inlet Conditions on Time-Average Behavior of Transverse Jets", *AIAA J.*, **43**, 1549-1555.
33. A. Soldati (2005) "Particles turbulence interactions in boundary layers", *J. Appl. Math. & Mech - ZAMM*, **85**, 683-699 (Solicited Review Paper).
32. M. Picciotto, C. Marchioli, M. Reeks and A. Soldati (2005) "Statistics of velocity and preferential accumulation of micro-particles in boundary layer turbulence" *Nucl. Eng. & Des.*, **235**, 1239-1249
31. M. Campolo, M.V. Salvetti, and A. Soldati (2005) "Mechanisms for Microparticle Dispersion in a jet in crossflow", *AIChE J.* **51**, 28-43.
30. M. Campolo and A. Soldati (2004) "Numerical evaluation of mixing time in a tank reactor stirred by a magnetically driven impeller", *Ind. Eng. & Chem. Res.*, **43**, 6836-6846.
29. M. Picciotto, C. Marchioli and A. Soldati (2004) "Further remarks on particle preferential distribution in the viscous region of turbulent boundary layers", (Invited Paper) *Multiphase Sci. & Technol.*, **16**.
28. F. Sbrizzai, R. Verzicco, M.F. Pidria and A. Soldati (2004) "Mechanisms for Selective Radial Dispersion of Microparticles in the Transitional Region of a Confined Turbulent Round Jet", *Int. J. Multiphase Flow*, **30**, 1389-1417.
27. C. Marchioli, A. Giusti, M.V. Salvetti, and A. Soldati (2003) "Direct Numerical Simulation of Particle Wall Transfer and Deposition in Upward Turbulent Pipe Flow", *Int. J. Multiphase Flow*, **29**, 1017-1038.
26. M. Campolo, P. Andreussi & A. Soldati (2002) "Flood forecasting in the river Arno", *J. Hydrol. Sci.*, **48**, 381-398
25. M. Campolo, F. Sbrizzai, and A. Soldati (2003) "Time dependent fluid dynamics and Lagrangian tracking to model mixing in Rushton-impeller baffled-tank reactor", *Chem. Eng. Sci.*, **58**, 1615-1629.
24. C. Narayanan, D. Lakehal, L. Botto, and A. Soldati (2003) "Mechanisms of particle deposition in a fully-developed turbulent open channel flow", *Phys. Fluids*, **15**, 763-775.
23. A. Soldati (2003) "Cost/efficiency analysis of a wire-plate ESP with an advection diffusion equation for turbulent particle transport", *Aerosol Sci. and Technol.*, **37**, 171-182.
22. C. Marchioli and A. Soldati (2002) "Mechanisms for Particle Transfer and Segregation in Turbulent Boundary Layer", *J. Fluid Mech.*, **468**, 283-315.
21. F. Beux, A. Iollo, M.V. Salvetti, and A. Soldati (2002) "Analytical approximation and proper orthogonal decomposition for efficient computations of electrostatic fields in wire-plate precipitators", *IEEE Trans. Ind. Appl.*, **38**, 858-865.
20. M. Campolo, P. Andreussi, and A. Soldati (2002) "Water quality control in the river Arno", *Water Research* **36** 2674-2681
19. A. Soldati, (2002) "Influence large-scale streamwise vortical EHD flows on wall turbulence," *Int. J. Heat Fluid Flow*, **23** 441-443.

18. M. Campolo and A. Soldati (2002) "Appraisal of Fluid Dynamic Efficiency of Retreated-Blade and Turbofoil Impellers in Industrial Size CSTR", *Ind. Eng. & Chem. Res.* **41** 1370-1377.
17. M. Campolo, A. Paglianti, and A. Soldati (2002) "Fluid Dynamic Efficiency and Scale-Up of a Retreated Blade Impeller CSTR", *Ind. Eng. & Chem. Res.* **41** 164-172.
16. S. Cerbelli, A. Giusti, and A. Soldati (2001) "ADE approach to predicting particle dispersion in wall bounded turbulent flows", *Int. J. Multiphase Flow*, **27**, 1861-1879.
15. F. Beux, A. Iollo, M.V. Salvetti and A. Soldati, (2001) "Approximation and reconstruction of the electrostatic field in wire-plate precipitators by a low-order model," *J. Comp. Phys.*, **170** 893-916
14. A. Serra, M. Campolo and A. Soldati (2001) "Time-dependent finite volume simulation of the turbulent flow field in a free-surface CSTR," *Chem. Engng Sci.*, **56**, 2715-2720 .
13. A. Soldati (2000) "On the effects of electrohydrodynamic flows and turbulence on aerosol transport and collection in wire-plate electrostatic precipitators", *J. Aerosol Sci.*, **31**, 293-305.
12. M. Campolo, A. Soldati, and P. Andreussi (1999) "Forecasting river flow rate during low-flow periods using neural network", *Water Resour. Res.*, **35**, 3547-3552.
11. M. Campolo, P. Andreussi, and A. Soldati (1999) "River flood forecasting with a neural network model", *Water Resour. Res.*, **35**, 1191-1197.
10. A. Soldati, and S. Banerjee (1998) "Turbulence modification by large-scale organized electrohydrodynamic flows," *Phys. Fluids*, **10**, 1742-1756.
9. L. Chittaro, R. Ranon, and A. Soldati (1998) "Introducing deviations and multiple abstraction levels in fault diagnosis of fluid transfer systems", *Artif. Intell. Eng.*, **9**, 355-373.
8. A. Soldati, M. Casal, P. Andreussi, and S. Banerjee (1997) "Lagrangian simulation of turbulent particle dispersion in electrostatic precipitators", *AIChE J.*, **43**, 1403-1413.
7. A. Paglianti, M. Giona, and A. Soldati (1996) "Characterization of subregimes in two-phase slug flow", *Int. J. Multiphase Flow*, **22**, 783-796.
6. A. Soldati, A. Paglianti, and M. Giona, (1996) "Identification of two-phase flow regimes via diffusional analysis of experimental time-series", *Exp. Fluids*, **21**, 151-160.
5. A. Soldati, and P. Andreussi (1996) "The influence of coalescence on droplet transfer in vertical annular flow", *Chem. Engng Sci.*, **51**, 353-363.
4. A. Soldati, P. Andreussi, and S. Banerjee (1995) "Direct simulation of turbulent particle transport in electrostatic precipitators - Reply". *AIChE J.*, **41**, 739-740.
3. M. Giona, A. Paglianti, and A. Soldati, (1994) "The application of diffusional techniques in time-series analysis to identify complex fluid dynamic regimes", *Fractals*, **2**, 503-520.
2. M. Giona, A. Paglianti, and A. Soldati, (1994) "Diffusional Analysis of Intermittent Two-Phase Flow Transitions", *Fractals*, **2**, 265-268.
1. A. Soldati, P. Andreussi, and S. Banerjee, (1993) "Direct simulation of turbulent particle transport in electrostatic precipitators", *AIChE J.*, **39**, 1910-1919.