Francesco Romanò

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Website	www.francescoromano.net
Nationality	Italian
Date of birth	December 15th, 1988
Marital status	Unmarried, no children

1. Research Activity

1.1 Career

Period	April 2018 – present
Position	*PostDoc,* Biomedical Engineering
Affiliation	University of Michigan, Department of Biomedical Engineering, Ann Arbor, MI (USA)
Research Topics	One of my research topics studies the multiphase flow in small respiratory airways by means of numerical simulations. Special attention is paid on the role of surfactants and rheological properties of the fluid in normal and pathological conditions. Another project of mine deals with a perivascular thin film in a porous medium between an artery and a brain tissue.
Main Collaborations	James B. Grotberg, Shuichi Takayama, Metin Muradoğlu, Hideki Fujioka, Vinod Suresh, Peter Galie

Period	October 2016 – March 2018
Position	*PostDoc,* Mechanical Engineering
Affiliation	TU Wien, Institute of Fluid Mechanics and Heat Transfer, Vienna (Austria)
Research Topics	My main project dealt with particle accumulation, mixing and Lagrangian topology in cavities. Besides, I also did some research on modeling the heat transfer in thermocapillary flows, developing numerical methods and modeling the forces on particles near a boundary.
Main Collaborations	Hendrik C. Kuhlmann, Ichiro Ueno, Haotian Wu, Pierre-Emmanuel Des Boscs, Michael Riedl, Edouard Hannezo

Period	October 2012 – September 2016
Position	*PhD Candidate,* Mechanical Engineering
Affiliation	TU Wien, Institute of Fluid Mechanics and Heat Transfer, Vienna (Austria)
Research Topics	In my main project I dealt with developing numerical methods for simulating small particles moving very close to undeformable boundaries. Based on the simulation results, a reduced-order model for the forces on particles near a boundary was derived to reliably predict the accumulation of particles in cavities. Besides, I also did some research on Lagrangian topology and thermocapillary flows.
Main Collaborations	Hendrik C. Kuhlmann, Christian Kuehn, Ichiro Ueno, Haotian Wu, Misa Ishimura, Saeed Masoudi

1.2 Projects and Grants

Project	Multiphase flow through converging nozzles
Role	Research
Grant No.	FFG Innovation Check #847669
Project	Steam sterilisation
Role	Editing of the project proposal and supervision
Grant No.	FFG Project #851030
Project	Dynamics of suspended particles in periodic vortex flows
Role	Research
Grant No.	ESA-SciSpace #AO-2000-091
Project	Thermocapillary oscillatory motion and interfacial heat exchange (JEREMI)
Role	Research
Grant No.	ESA-SciSpace #AO-2004-097
Project	Modelling Support to ESA-JAXA JEREMI project on ISS
Role	Editing of the project proposal and research
Grant No.	ESA-SciSpace #PO-4000121111
Project	Microfluidic tissue engineering of small airway injuries
Role	Research
Grant No.	NIH research Grant #1R01HL136141-01
Project	Effect of surfactants and non-Newtonian fluid properties in small airway reopening
Role	Editing of the project proposal
Grant No.	NIH research Grant, submitted
Project	Stability Analysis for the JEREMI Experiment
Role	Editing of the project proposal and supervision
Grant No.	FFG Project "SAJE", accepted
Project	Intricate bodies in the boundary layer bridging fluid mechanics, morphology and ecology in larval Drusinae (Insecta: Trichoptera)
Role	Editing of the project proposal
Grant No.	FWF Project #P30048-B29

1.3 Awards and Invited Talks

Awards	Medal for graduation with honors, University of Pisa, 2012
	Quarterly Franklin Membership, Membership ID #YG60806, 2018
	Qualification as Maître de Conférences #19260330790, 2019
Invited Talks	F. Romanò, *Particle accumulation stuctures in thermocapillary liquid bridges*, Tokyo University of Science, Tokyo, Japan, March 2016.
	F. Romanò, *A universal mechanism for rapid particle accumulation in fluids*, PPrime, Poitiers, France, November 2017.
	F. Romanò, *Lagrangian chaos: mixing and coherent structures*, Institute of Science and Technology, Vienna, Austria, January 2018.
	F. Romanò, *Liquid plug formation in an airway closure model*, Institute of Science and Technology, Vienna, Austria, September 2018.

1.4 Organization and Reviewing Activity

Conferences	Organizing Committee 7th Conference of the International Marangoni Association (IMA7), Vienna, 2014
	Organizing Committee 12th European Fluid Mechanics Conference (EFMC12), Vienna, 2018
	Scientific Committee Conference on Modelling Fluid Flow (CMFF'18), Budapest, 2018
	Chairman of the Session "Control and drag reduction 4" 12th European Fluid Mechanics Conference (EFMC12), Vienna, 2018
	Reviewer of the Conference Conference on Modelling Fluid Flow (CMFF'18), Budapest, 2018
	Reviewer of the Conference 10th International Conference on Multiphase Flow (ICMF2019), Rio de Janeiro, 2019 Reviewer of the Conference The Second International Conference on Mechanical, Electric and Industrial Engineering (MEIE 2019), China, 2018
Reviewer	Acta Mechanica European Journal of Mechanics / B Fluids International Journal of Heat and Mass Transfer International Journal of Multiphase Flow International Journal of Thermal Science Journal of Fluid Mechanics Journal of Scientific Computing Microgravity Science and Technolology World Journal of Mechanics

1.5 Competences

Software	Nek5000, FreeFEM++, OpenFoam, basilisk, NGSolve, Fluent, Ansys, DS Catia V5, IcemCFD, Gambit, DistMesh, ParaView, Tecplot360, VisIt
Programming Languages	MATLAB, C++, Fortran, python, shell
Communication	Excellent communication skills acquired during the oral presentations in 31 international conferences, teaching experiences (176 hours) at Technical University of Vienna, 2 national and 2 international seminars, weekly working groups and numerous written publications.

2. Teaching Activity

2.1 Teaching Experience

Period	October 2012 – January 2018
Title of Qualification	*University Assistant*
Course Title	*Numerical Methods in Fluid Dynamics* (176 hours)
Slides and Codes	`https://francescoromano.net/informazioni/`
Affiliation	TU Wien, Institute of Fluid Mechanics and Heat Transfer, BA-Hochhaus/E322, Getreidemarkt 9, 1060 Vienna, Austria

2.2 Examining Experience

Period	October 2012 – January 2018
Title of Qualification	*University Assistant*
Course Title	*Numerical Methods in Fluid Dynamics*
Affiliation	TU Wien, Institute of Fluid Mechanics and Heat Transfer, BA-Hochhaus/E322, Getreidemarkt 9, 1060 Vienna, Austria

Period	October 2012 – January 2018
Title of Qualification	*University Assistant*
Course Title	*Numerical Methods for Engineering*
Affiliation	TU Wien, Institute of Fluid Mechanics and Heat Transfer, BA-Hochhaus/E322, Getreidemarkt 9, 1060 Vienna, Austria

2.3 Mentoring

Christian Schmidrathner	FFG project # 851030, PhD Thesis, TU Wien
Michael Riedl	Master Thesis, TU Wien
Vincze Mihály	Master Thesis, TU Wien & Budapest University of Technology and Economics
Arash Hajisharifi	Master Thesis, TU Wien & University of Pisa
Sencer Yücesan	Master Thesis, TU Wien & University of Applied Sciences Wiener Neustadt Ltd.
Faraz Beladi	Bachelor Thesis, TU Wien
Parvathy K. K.	Bachelor Thesis, TU Wien & Birla Institute of Technology and Science
Tuğçe Türkbay	Internship, TU Wien & Çukurova University
Shaimaa Hefny	Internship, TU Wien & Alexandria University
Takeru Oba	Exchange Student Scholarship, TU Wien & Tokyo University of Science
Saeid Panahi	Exchange Student Scholarship, TU Wien & Amirkabir University of Technology
Lukas Barbor	PhD Thesis, TU Wien
Mario Stojanovic	PhD Thesis, TU Wien
Joseph Cavataio	Internship, University of Michigan
Samantha Rondeau	Internship, University of Michigan

3. Education

Period	October 2012 – September 2016
Degree	*PhD,* Mechanical Engineering, full marks and distinction
Thesis Title	*Particle accumulation structures in boundary-driven flows*
Supervisor	Prof. Hendrik C. Kuhlmann
Highlights of the Reviewers	*"I enjoyed reading this dissertation. It is well organized and flows logically, and the author has obtained a wealth of new, interesting, and relevant results. The analyses and conclusions are well justified. I expect that this dissertation will have an impact on the research area.",* Prof. Eckart Meiburg, Dept. Mech. Eng., University of California, Santa Barbara. *"The work is ambitious, and definitely provides an original and significant contribution to the understanding of PAS formation in liquid bridges, but also (and for the first time) in mechanically-driven laminar flows. The study is useful from a modelling point of view as well, since it provides original statistics to estimate the actual value of the interaction length, a crucial parameter of the PSI model.",* Prof. (Assoc.) Cristian Marchioli, Dept. of Eng. Architect., University of Udine.
Affiliation	TU Wien, Institute of Fluid Mechanics and Heat Transfer, BA-Hochhaus/E322, Getreidemarkt 9, 1060 Vienna, Austria

Period	October 2010 – July 2012
Degree	*MSc,* Aerospace Engineering, full marks and highest honors
Thesis Title	*Analysis of some streaks generation method in a Blasius boundary layer*
Supervisor	Prof. (Assoc.) Simone Camarri
Affiliation	University of Pisa, Department of Civil and Industrial Engineering, Via Diotisalvi, 2, 56122 Pisa (PI), Italy

Period	September 2007 – October 2010
Degree	*BSc,* Aerospace Engineering, full marks
Thesis Title	*Transient of Poiseuille flow simulation using FreeFEM++*
Supervisor	Prof. Maria Vittoria Salvetti
Affiliation	University of Pisa, Department of Civil and Industrial Engineering, Via Diotisalvi, 2, 56122 Pisa (PI), Italy

Period	September 2002 – July 2007
Degree	*High School Diploma,* Scientific-Oriented High School, full marks
Affiliation	Liceo Scientifico "G.Berto", Contrada Bitonto, 2, 89900 Vibo Valentia (VV), Italy

4. Publications

Book Chapters

H. C. Kuhlmann, F. Romanò, *The lid-driven cavity* , Computational Modelling of Bifurcations and Instabilities in Fluid Dynamics, Springer, **50** (2018) 233–310.

Scientific Papers

F. Romanò, H. C. Kuhlmann, *Numerical investigation of the interaction of a finite-size particle with a tangentially moving boundary*, Int. J. Heat Fluid Fl., **62** (A) (2016) 75–82.

F. Romanò, H. C. Kuhlmann, *Smoothed-profile method for momentum and heat transfer in particulate flows*, Int. J. Numer. Meth. Fluids, **83** (6) (2017) 485–512.

F. Romanò, H. C. Kuhlmann, *Particle–free-surface interaction in a shear-driven cavity flow*, Theor. Comp. Fluid Dyn., **31** (4) (2017) 427–445.

F. Romanò, A. Hajisharifi, H. C. Kuhlmann, *Cellular flow in a partially filled rotating drum: regular and chaotic advection*, J. Fluid Mech., **825** (2017) 631–650.

F. Romanò, S. Albensoeder, H. C. Kuhlmann, *Topology of three-dimensional steady cellular flow in a two-sided anti-parallel lid-driven cavity*, J. Fluid Mech., **826** (2017) 302–334.

F. Romanò, H. C. Kuhlmann, M. Ishimura, I. Ueno *Limit cycles for the motion of finite-size particles in axisymmetric thermocapillary flows in liquid bridges*, Phys. Fluids, **29** (2017) 093303.

C. Kuehn, F. Romanò, H. C. Kuhlmann, *Tracking particles in flows near invariant manifolds via balance functions*, Nonlinear Dynamics, Nonlinear Dyn., **92** (2018) 983–1000.

F. Romanò, H. C. Kuhlmann, *Finite-size Lagrangian coherent structures in thermocapillary liquid bridges*, Phys. Rev. Fluids, **3** (2018) 094302.

F. Romanò, *Oscillatory switching centrifugation: dynamics of a particle in a pulsating vortex*, J. Fluid Mech., **857** (2018) R3.

F. Romanò, H. Wu, H. C. Kuhlmann, *A generic mechanism for finite-size coherent particle structures*, Int. J. Multiphase Flow, **111** (2019) 42–52.

F. Romanò, H. C. Kuhlmann, *Heat transfer across the free surface of a thermocapillary liquid bridge*, Tech. Mech., **39** (2019) 72–84.

F. Romanò, Parvathy K. K., H. C. Kuhlmann, *Finite-size Lagrangian coherent structures in a two-sided lid-driven cavity*, Phys. Rev. Fluids, **4** (2019) 024302.

F. Romanò, H. C. Kuhlmann, *Finite-size coherent structures in thermocapillary liquid bridges: A review*, Int. J. Microgravity Sci. Appl., **accepted**.

F. Romanò, H. Fujioka, M. Muradoglu, J. B. Grotberg, *Liquid plug formation in an airway closure model*, Phys. Rev. Fluids, **submitted**.

M. Muradoglu, F. Romanò, H. Fujioka, J. B. Grotberg, *Effects of surfactant on propagation and rupture of a liquid plug in a tube.*, J. Fluid Mech., **submitted**.

Conference Proceedings

F. Romanò, H. C. Kuhlmann, *Interaction of a finite-size particle with the moving lid of a cavity*, PAMM, **15** (1) (2015) 519–520.

H. C. Kuhlmann, F. Romanò, H. Wu, S. Albensoeder, *Particle-motion attractors due to particle–boundary interaction in incompressible steady three-dimensional flows*, The 20th Australasian Fluid Mechanics Conference (ed. G. Ivey, T. Zhou, N. Jones, S. Draper), Australasian Fluid Mechanics Society (2016), pp. 102, paper no. 449.

H. Wu, F. Romanò, H. C. Kuhlmann, *Attractors for the motion of finite-size particles in a two-sided lid-driven cavity*, PAMM, **17** (2017) 669–670.

H. Wu, F. Romanò, H. C. Kuhlmann, *Attractors for the motion of finite-size particles in a lid-driven cavity*, **25**. Fachtagung Experimentelle Strömungsmechanik, (2017), 62.

H. Wu, F. Romanò, H. C. Kuhlmann, *Attractors for the motion of finite-size particles in a two-sided anti-parallel lid-driven cavity*, ICEFM (2018), 1–6.

F. Romanò, S. Albensoeder, H. C. Kuhlmann *Topology of three-dimensional steady cellular* flow in a two-sided lid-driven cavity, APS Bulletin (2015).

F. Romanò, H. C. Kuhlmann *Topology of azimuthally travelling waves in thermocapillary* liquid bridges, APS Bullerin (2016).

F. Romanò, H. C. Kuhlmann *Finite-size Lagrangian coherent particle structures in* thermocapillary liquid bridges, APS Bulletin (2017).

F. Romanò, H. Fujioka, M. Muradoglu, J. B. Grotberg, *CFD model of airway closure*, BMES (2018).

M. Muradoglu, F. Romanò, H. Fujioka, J. B. Grotberg, *Effects of soluble surfactant on plug propagation and rupture in airways*, BMES (2018).

H. Fujioka, F. Romanò, M. Metin, J. B. Grotberg, *Effect of gravity on the split of liquid plug at pulmonary bifurcation*, BMES (2018).

F. Romanò, H. Fujioka, M. Metin, J. B. Grotberg, *Liquid plug formation in an airway closure model*, APS Bulletin (2018).

M. Metin, F. Romanò, H. Fujioka, J. B. Grotberg, *Effects of coughing on a surfactant-laden liquid plug in distal airways*, APS Bulletin (2018).

P.-E. des Boscs, F. Romanò, H. C. Kuhlmann, *Forces and torques exerted by a Stokes corner flow on a moving sphere*, IFMC, (2019) 1–2.

H. C. Kuhlmann, F. Romanò, *Finite-size coherent structures: a universal phenomenon?*, IFMC, (2019) 1–2.

Conferences

F. Romanò, H. C. Kuhlmann, *SEM & DG-FEM applied to Fluid Dynamics*, 19th ERCOFTAC ADA-Pilot Center Meeting, Udine, Italy, May 2014.

F. Romanò, H. C. Kuhlmann, *Interaction of a finitesize particle with the moving lid of a cavity*, GAMM 86th Annual Scientific Conference, Lecce, Italy, March 2015.

F. Romanò, H.C. Kuhlmann, *Smoothed profile method for particle-laden flows*, 21st ERCOFTAC ADA-Pilot Center Meeting, Vienna, Austria, May 2015.

F. Romanò, H. C. Kuhlmann, *Numerical investigation of the interaction of a finite-size particle with a tangentially moving boundary*, CMFF'15, Budapest, Hungary, September 2015.

F. Romanò, H. C. Kuhlmann, *Modelling the motion of finite-size particles near a thermocapillary free-surface by a two-way-coupling approach*, ISPS-6/ITTW2015, Kyoto, Japan, September 2015.

H. C. Kuhlmann, S. Masoudi, F. Romanò, *Multi-phase flow through converging nozzles*, 20th ERCOFTAC ADA-Pilot Center Meeting, Maribor, Slovenia, November 2015.

F. Romanò, S. Albensoeder, H. C. Kuhlmann *Topology of three-dimensional steady* cellular flow in a two-sided lid-driven cavity, 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, USA, November 2015.

H. C. Kuhlmann, F. Romanò, S. Albensoeder, *Flow topology and attractors for the motion* of finite-size particles in a three-dimensional steady cavity flow, 9th International Conference on Multiphase Flow, Firenze, Italy, May 2016.

F. Romanò, H. C. Kuhlmann, *Modelling the motion of finite-size particles near a moving* wall by a two-way coupling approach, 9th International Conference on Multiphase Flow, Firenze, Italy, May 2016.

F. Romanò, M. Ishimura, H. C. Kuhlmann, I. Ueno *On the role of the heat transfer in* modelling axisymmetric particle accumulation in thermocapillary liquid bridges, 8th Conference of the International Marangoni Association, Bad Honnef, Germany, June 2016.

M. Ishimura, F. Romanò, H. C. Kuhlmann, I. Ueno *Experimental study on the finite-size* particle behavior in a steady flow in a thermocapillary liquid bridge, 8th Conference of the International Marangoni Association, Bad Honnef, Germany, June 2016.

F. Romanò, H. C. Kuhlmann *Particle accumulation structures in steady closed flows driven* by surface forces, 11th European Conference of Fluid Dynamics, Seville, Spain, September 2016.

F. Romanò, H. C. Kuhlmann *Topology of azimuthally travelling waves in thermocapillary* liquid bridges, 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, USA, November 2016.

H.C. Kuhlmann, F. Romanò, H. Wu, S. Albensoeder, *Particle-motion attractors due to particle-boundary interaction in incompressible steady three-dimensional flows*, The 20th Australasian Fluid Mechanics Conference, Perth, Australia, December 2016.

H. Wu, F. Romanò, H. C. Kuhlmann, *Attractors for the motion of finite-size particles in a two-sided lid-driven cavity*, GAMM 88th Annual Scientific Conference, Weimar, Germany, March 2017.

F. Romanò, H.C. Kuhlmann, *Finite-size coherent structures in thermocapillary liquid bridges*, 25th ERCOFTAC ADA-Pilot Center Meeting, Vienna, Austria, April 2017.

F. Romanò, H.C. Kuhlmann, *Instability of the flow in suspended thermocapillary thin films*, The 7th International Symposium "Bifurcations and Instabilities in Fluid Dynamics", The Woodlands, USA, July 2017.

F. Romanò, H. C. Kuhlmann *Lagrangian finite-size coherent structures in thermocapillary liquid bridges*, ISPS-7/ELGRA-25, Juan les Pines, France, October 2017.

H. Wu, F. Romanò, H. C. Kuhlmann *Attractors for the motion of finite-size particles in a lid-driven cavity*, Fachtagung "Experimentelle Strömungsmechanik", Karlsruhe, Germany, September 2017.

F. Romanò, H. C. Kuhlmann *Finite-size Lagrangian coherent particle structures in* thermocapillary liquid bridges, 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, November 2017.

H. Wu, F. Romanò, H.C. Kuhlmann, *Attractors for the motion of finite-size particles in, two-sided lid driven cavities*, 26th ERCOFTAC ADA-Pilot Center Meeting, Graz, Austria, November 2017.

H. Wu, F. Romanò, H. C. Kuhlmann *Attractors for the motion of finite-size particles in a two-sided anti-parallel lid-driven cavity*, ICEFM18, Munich, Germany, July 2018.

F. Romanò, H. C. Kuhlmann *Heat transfer across the free surface of a thermocapillary liquid bridge*, CMFF'18, Budapest, Hungary, September 2018.

F. Romanò, P.-E. des Boscs, H. C. Kuhlmann *Forces and torques on a spherical particle moving near the edge made by two rectangular walls in Stokes flow*, EFMC12, Vienna, Austria, September 2018.

H. Wu, F. Romanò, H. C. Kuhlmann *Motion of finite-size particles in a lid-driven cubic cavity*, EFMC12, Vienna, Austria, September 2018.

F. Romanò, H. Fujioka, M. Muradoglu, J. B. Grotberg, *CFD model of airway closure* BMES, Atlanta, USA, October 2018.

M. Muradoglu, F. Romanò, H. Fujioka, J. B. Grotberg, *Effects of soluble surfactant on plug propagation and rupture in airways*, BMES, Atlanta, USA, October 2018.

H. Fujioka, F. Romanò, M. Metin, J. B. Grotberg, *Effect of gravity on the split of liquid plug at pulmonary bifurcation*, BMES, Atlanta, USA, October 2018.

I. Barmak, F. Romanò, H. C. Kuhlmann *Particle accumulation in high-Prandtl-number* liquid bridges, 28th ERCOFTAC ADA Pilot Centre Meeting, Maribor, Slovenia, November 2018.

F. Romanò, H. Fujioka, M. Metin, J. B. Grotberg, *Liquid plug formation in an airway closure model*, 71th Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, November 2018.

M. Metin, F. Romanò, H. Fujioka, J. B. Grotberg, *Effects of coughing on a surfactant-laden liquid plug in distal airways*, 71th Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, November 2018.

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