

## PERSONAL INFORMATION

**Prestininzi Pietro**

 108, Via Silvio D'Amico, 00145, ROMA

 +39 0657333639  +39 366 7751887

 [pietro.prestininzi@uniroma3.it](mailto:pietro.prestininzi@uniroma3.it)

Gender Male | Date of birth 9 March 1981 | Nationality Italian

## WORK EXPERIENCE

2016 - present **Teaching**

Teacher for the course: *Hydraulics* within the Civil Engineering Faculty, "Roma Tre" University, Rome

- Fundamental concepts of fluid mechanics.

2017 – 2018 **Teaching**

Teacher for the M.Sc. course "Natural Risk Protection" within the Civil Engineering Faculty, "Roma Tre" University, Rome. Course title : *Pollution dynamics in water bodies*

- Fundamental and advanced topics related to molecular and turbulence diffusion, dispersion, their measurement and modelling techniques.

2007 – 2017 **Teaching Assistant**

"Roma Tre" University, Rome

- Teaching support activities for several courses: Hydraulics, Hydraulic protection, Flood Mitigation, Hydrodynamics, Fluid Mechanics.
- Lectures, exercises, seminars.

2010 **Consultancy**

Consultancy activities between "Roma Tre" University, Rome, Department of Civil Engineering and S.I.D.I. S.p.A.

- Hydraulic study of passive and active flood mitigation strategies for Castelnuovo di Porto town.
- Hydraulic modelling of Tevere river, design and assessment of storage areas.
- Development of multiparametric automatic calibration procedures for river hydraulic models.

2008 – 2011 **Teaching**

"Roma Tre" University, Rome

Teaching Activities for the Post-graduate master course "IEAT", Engineering and Economics for the Environment

2007 **Teaching**

Elis - Educazione, Lavoro, Istruzione, Sport. (Education, work, training, sport)

English teacher for IFTS course - Istruzione Formazione Tecnica Superiore: CISCO CCNA network systems.

2006 **Consultancy**

Consultancy activities between “Roma Tre” University, Rome, Department of Civil Engineering and Tecnis Anas S.p.A.

- Development and implementation of a 1D-2D integrated hydraulic model.
- Flood risk level assessment for the design of new road connection Salaria-Tiberina downstream of Ponte del Grillo.
- Design and implementation of pre- and post-processing tools in GIS and CAD environments.

#### 2006 Consultancy

Consultancy activities for Hydrosistem S.r.L.

- Development and implementation of a hydraulic model for flood assessment in the Arrone river basin (client: ARES 2002 S.p.A).
- Design and implementation of *ad-hoc* pre- and post-processing tools in GIS and CAD environments.

#### 2005 – Present Teaching

Teaching Activities for the Post-graduate master course "Hydraulic Risk mitigation", CERI center, “La Sapienza” University of Rome

- Teaching of mitigation strategies, legislation, and modelling approaches.
- HEC RAS 1D+2D modelling, and its integration with GIS (HEC GEO RAS).

#### 2005 – 2006 Consultancy

Consultancy activities between “Roma Tre” University, Rome, Department of Civil Engineering and Regione Lazio - Direzione Regionale Ambiente e e Cooperazione tra i Popoli.

- Development and implementation of a 1D-2D integrated hydraulic model.
- Drought risk assessment for Arrone river Basin.
- Design and implementation of pre- and post-processing tools in GIS and CAD environments.

#### 2005 Consultancy

Consultancy activities for Hydrosistem S.r.L.

- Development and implementation of a 1D-2D integrated hydraulic model.
- Assessment of attainable flood risk reduction for Arrone river Basin through the design of a storage area.
- Design and implementation of pre- and post-processing tools in GIS and CAD environments.

#### 2013 – 2014 Teaching

Teacher for the M.Sc. course “Natural Risk Protection” within the Civil Engineering Faculty, “Roma Tre” University, Rome. Course title : *Pollution dynamics in water bodies*

- Fundamentals and advanced topics related to molecular and turbulence diffusion, dispersion, their measurement and modelling techniques.

#### 2013 – 2014 Consultancy

Technical Consultant to the Judiciary of Grosseto (GR, Italy), for topics pertinent to inundations and flood risk assessment.

- Appointed by the Judiciary, given the expertise in the field, to reconstruct the dynamics of calamitous flood events, in order to assess responsibilities.

#### 2017 – 2018 Consultancy

Technical Consultant to the Judiciary of Livorno (LI, Italy), for topics pertinent to inundations and flood risk assessment.

- Appointed by the Judiciary, given the expertise in the field, to reconstruct the dynamics of calamitous flood events, in order to assess responsibilities.

### 2013 – 2015 Teaching

Teacher for the preparatory course “Mathematics” for 1-st year students.

- Fundamentals Mathematics concepts aimed at bridging the gap between High School and University studies.

## SCIENTIFIC EXPERIENCE

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### 09/2016 – present Post-doc

Three-year post-doc position (art.22 L. 240/2010) (SSD ICAR/01) at “Roma Tre” University, Rome, Department of Engineering

- Advanced theoretical, numerical and experimental modelling of gravity currents for environmental flows.

### 2013-2014 Research project participant

Research activities within the research agreement between “Roma Tre” University, Rome, Department of Civil Engineering and Salini Costruttori S.p.A.: “Ethiopia Branch: Numerical model to investigate the hydraulic behaviour of the Gated Spillway of the Grand Ethiopian Renaissance Dam.”

- Implementation of 3D numerical models for free surface flows.
- Analysis of hydraulic risk scenarios for the support to the design and construction of the left spillway of the Grand Ethiopian Renaissance Dam

### 2013-2014 Research project participant

Research activities within the research agreement between “Roma Tre” University, Rome, Department of Civil Engineering and Ente Acque Umbre-Toscane: “Hydraulic modelling of gated and ungated spillway of the Montedoglio Dam”

- Implementation of 3D numerical models for free surface flows.
- Analysis of hydraulic risk scenarios for the support to design and reconstruction of the lateral spillway of the Montedoglio Dam.

### 2014 – present PhD supervisor

Supervisor of Andrea Montessori, “Roma Tre” University, Rome, Department of Engineering, Doctoral course in Civil Engineering.

Supervisor of Michele Curatolo, “Roma Tre” University, Rome, Department of Engineering, Doctoral course in Civil Engineering.

### 2012 – 2013 Research project participant

Research activities within the research agreement between “Roma Tre” University, Rome, Department of Civil Engineering and Technip company.

- Vulnerability and failure analysis of a water pipe network for a Technipe plant in Mexico.
- Development of integrated tools for hydraulic transients in pipe networks and comparison of mitigation strategies.
- Design and implementation of pre- and post-processing tools in spreadsheets.

**2013 Research project leader**

Principal investigator for the research agreement between “Roma Tre” University, Rome, Department of Civil Engineering and Technip company.

- Vulnerability and failure analysis of a water pipe network for a Technipe plant in Brasil.
- Development of integrated tools for hydraulic transients in pipe networks and comparison of mitigation strategies.
- Design and implementation of pre- and post-processing tools in spreadsheets.

**2012 – 2014 – 2015 International conference organization**

Organizer and chairman of session “Hydrodynamics: CFD” at ISOPE “Ocean and Polar Engineering Conference”, Rhodes (GR) 2012, Anchorage (USA) 2014, and Kona (USA) 2015.

Paper selection, editing and review. Attending and chairing session, moderating discussion.

**2016-present International conference Technical Program Committee (TPC) member**

Member of the permanent TPC of the ISOPE conference.

Conference Organization, Evaluation of session proposals, peer revieweing.

**12/2013 Invited Seminar**

Seminar on “Lattice Boltzmann simulation for MultiLayer Shallow Water Equations”

University of Catania, Department of Engineering, Prof. Musumeci Rosaria

**10/2012 – 01/2013 Visiting Fellow**

Winner of DAAD grant at Institute for Computational Modeling in Civil Engineering - Technische Universität Braunschweig- Prof. Manfred Krafczyk.

- Development of Finite Volume Lattice Boltzmann Multilayer Shallow Water Models.

**10/2012 Invited Seminar**

Seminar on “Lattice Boltzmann simulation for MultiLayer Shallow Water Equations”

Institute for Computational Modeling in Civil Engineering - Technische Universität Braunschweig- Prof. Manfred Krafczyk.

**2011 – 2012 Research project participant**

Research activity within the international project SECOA - Solutions for Environmental contrasts in Coastal Areas. In collaboration with Dipartimento di Scienze della Terra - Università di Roma *La Sapienza*

- Assessment of the effectiveness of the procedures for risk-prevention and mitigation of flooding events in coastal areas.
- Assessment of the effects of the mean sea level rise on Lazio coast.

**09/2011 – 09/2016 Assistant Professor**

Fixed term position of Assistant Professor (art.1 comma 14 L. 230/05), (SSD ICAR/01) at “Roma Tre” University, Rome, Department of Engineering

- Environmental fluid dynamics: from Navier-Stokes to the Shallow Water Equations.
- Computational fluid dynamics by means of the Lattice Boltzmann Method.

**2011– 2013 Research project participant**

Research activities within the research project funded by MIUR (PRIN) : “ Energia idroelettrica da osmosi in ambiente costiero ” UO Roma Tre. PI Prof Tucciarelli Tullio

- Development of numerical models for propagation of salt wedge in estuarine environments.

05/2009 – 05/2011 **Post-doc**

Two-year post-doc position (art. 51, comma 6, L. 398/97) (SSD ICAR/02) at “Roma Tre” University, Rome, Department of Engineering

- Numerical modelling of Shallow Water Equations
- Applications of numerical models to large scale floods events.

05/2007 – 09/2007 **Visiting Fellow**

Visiting Fellow at School of Geographical Sciences, Bristol University, Prof. Paul Bates.

- Formulation and implementation of simplified hydraulic 2D models aimed at urban development planning
- Flood Risk areas assessment in GIS and CAD environments.

2007 – Present **Reviewer**

Anonymous Reviewer for several scientific journals

- Scientific Reports - Nature; Journal of Fluid Mechanics; Computers and Mathematics with Applications; Physical Review E; Computers and Fluids; Journal of Hydroinformatics; Journal of Hydraulic Research, Hydrological Processes; Journal of Hydrology; Physics and Chemistry of the Earth; Remote Sensing; Ocean Modelling, International Journal “Water Management” ICE; and others

2005– 2007 **Research project participant**

Research activities within the research project funded by MIUR (PRIN) : “Standardizzazione della progettazione dei manufatti idraulici presenti nelle reti di drenaggio urbano.” UO Roma Tre. PI Prof Calenda Guido.

- Development of numerical and experimental models of free flows within sewage networks.

## EDUCATION AND TRAINING

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03/2016 **Course attendance**

Course on Arduino system, at “Roma Tre” University, Rome, Department of Engineering

- Program the electronic micro-controller for basic and advanced projects.

10/2011 **Course attendance**

Course on “Python scripting”, at CASPUR “Consorzio interuniversitario per le Applicazioni di supercalcolo per Università e Ricerca”, Rome

- Python for general purpose scripting.
- Python aimed at applications managing and wrapping.
- Python for procedure automatization in GIS environments.
- Numerical libraries for Python.

11/2009 **Course attendance**

Course on “Infoworks CS + 2D”, at Wallingford, Italia

- Advanced use of IW interface.
- IW integration with databases and GIS (Access and ArcGIS).
- Development of advanced user defined functions by means of SQL.

**10/2005 – 04/2009 PhD course**

“Roma Tre” University, Rome, Department of Engineering, Italy

Thesis Title: ‘Numerical Modelling of River Floods’, defended on 6<sup>th</sup> April 2009

**06/2008 Course attendance**

“Water Waves for Engineers”, held by Prof. Brocchini M.

Istituto di Idraulica e Infrastrutture Viarie, Università Politecnica delle Marche, Ancona, Italy

- Coastal hydro and morphodynamics.
- Wave resolving models for shallow water waves.
- Wave averaging models for shallow water morphodynamics, rip-currents, coastal protection.
- Tidal Modelling.
- Wave structure interaction.

**10/2007 – 04/2008 Course attendance**

“Advanced Numerical Analysis”, held by Prof. Spigler R.

“Roma Tre” University, Rome, Department of Mathematics, Italy

- Iterative methods for non linear systems of equations.
- Minimum residual formulations.
- Power and inverse iteration methods for eigenvalues calculation, Sturm series, QR and householder methods.
- Systems of ODE: multistep and multistage algorithms.

**2007 Course attendance**

“Summer School on Advanced Programming”, held by CASPUR, 3rd edition, - Villa Fiorio, Grottaferrata - Roma

- C Language introduction; Traps of C language; Algorithms and data structures in C; Performance and system architecture; Compiler best usage; Libraries and mixed language programming; Q&A;
- Parallel programming: advanced MPI ; OpenMP ; Hybrid OpenMP+MPI ; Introduction to GPU and CUDA ; advanced CUDA; Multi GPU programming; Debugging e profiling; CUDA Debugging.

**2006 – 2007 Course attendance**

“Analytical Methods for solving differential equations”, held by Prof. Sammarco P.

“Roma Tre” University, Rome, Department of Civil Engineering, Italy

- Linear ODE classifications.
- Separation of variables, Sturm-Liouville problems, Green functions, Fourier and Laplace Transform, Bessel Functions.
- Complex analysis.
- Perturbative analysis, multiple scale expansion analysis, asymptotic homogenization.

**12/2005 Professional habilitation as Engineer****2000 – 2004 University Course**

Degree in “Civil Engineering, Hydraulics”

“Roma Tre” University, Rome, Faculty of Engineering, Italy

Thesis Title: “Development of a 2D parabolic model for Flood modelling”, defended on 12<sup>th</sup> April 2005. Final Mark 110/110 *cum laude*.

2003 – 2004 **University Course**

One year course on “Building Techniques”

“Roma Tre” University, Rome, Faculty of Engineering, Italy

Final Mark : 30/30

- Civil structure design.
- Steel, reinforced concrete and pre-stressed reinforced concrete structures calculation.

1993 – 1998 **High school**

Five year course, “Classical” studies.

“Francesco Vivona” high school, Rome, Italy

Diploma final mark : 100/100

1995 – 2000 **Foreign language studies**

English school attendance: “British School’

- British Council certifications
- 1998 FCE (First Certificate in English)
  - 1999 CAE (Certificate in Advanced English)
  - 1999 CPE (Certificate of Proficiency in English), with overall mark “B”

**PERSONAL SKILLS**

Mother tongue Italian

Other languages	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
Certificate of Proficiency in English					

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user  
[Common European Framework of Reference for Languages](http://www.cedefop.europa.eu/en/files/quest_doc/CEFR.pdf)

- Computer skills**
- General deep knowledge of computer systems.
  - Advanced knowledge of all MS OFFICE SUITE components
  - Advanced knowledge of mathematical tools (Matlab, Octave, Mathcad, Mathematica)
  - Advanced knowledge of CAD systems including GIS integration (CAD MAP) and surface modelling (QUICKSURF)
  - Good knowledge of programming languages for in CAD environments (LISP, VBA for Auto-cad)
  - Good knowledge of open source GIS QGis
  - Good knowledge of GIS ArcGis
  - Deep experience in the programming language FORTRAN 77/90/95/2003, aimed at developing CFD parallel codes.
  - Good knowledge in the programming language C.
  - Advanced knowledge of mesh generator ARGUS-ONE.
  - Good knowledge of structural analysis software SAP.
  - Good knowledge of scripting language Python, mainly focused at GIS applications.
  - Good knowledge of hydraulic and hydrologic modelling in INFOWORKS CS + 2D.
  - Advanced knowledge of freeware software for hydraulic modelling HEC-RAS and good knowledge of its GIS interface (HEC GEO RAS).
  - Advanced knowledge of CFD model FLOW-3D.
  - Good knowledge of CFD model FLO 2D.
  - Advanced knowledge of markup language LaTeX

**Driving license** B



## Publications on peer-reviewed international journals

- Curatolo M, La Rosa M, **Prestininzi P**, On the validity of plane state assumptions in the bending of bimorph piezoelectric cantilevers, (2019), Journal of Intelligent Material Systems and Structures 30 (10), 1508-1517
- La Rocca M, Montessori A, **Prestininzi P**, Elango L , Discrete Boltzmann Equation model of polydisperse shallow granular flows, (2019), International Journal of Multiphase Flow 113, 107-116
- La Rocca M, Montessori A, **Prestininzi P**, Elango L , A discrete Boltzmann equation model for two-phase shallow granular flows, (2018), Computers and Mathematics with Applications, 75, 8, 2814-2824.
- Ottolenghi L, **Prestininzi P**, Montessori A, Adduce C, La Rocca M, Lattice Boltzmann simulations of gravity currents, (2018) European Journal of Mechanics - B/Fluids, 67, 125-136.
- Montessori, A, **Prestininzi, P**, La Rocca, Succi, S, Entropic lattice pseudo-potentials for multiphase flow simulations at high Weber and Reynolds numbers, (2017), Physics of Fluids, 29:9
- **Prestininzi P**, Abdolali A, Montessori A, Kirby JT, La Rocca M, Lattice Boltzmann approach for hydro-acoustic waves generated by tsunamigenic sea bottom displacement (2016), Ocean Modelling, 107, pp. 14-20.
- **Prestininzi P**, Sciortino G, Montessori A, La Rocca M, Simulation of arrested salt wedges with a multi-layer Shallow Water Lattice Boltzmann model (2016), Advances in Water Resources, 96, pp. 282-289.
- Falcucci G, Succi S, Montessori A, Melchionna S, **Prestininzi P**, Barroo C, Bell DC, Biener MM, Biener J, Zugic B, Kaxiras E, Mapping reactive flow patterns in monolithic nanoporous catalysts (2016), Microfluidics and Nanofluidics (2016) 20 (7) art. no. 105.
- Montessori, A; **Prestininzi, P**; La Rocca, M; Falcucci, G; Succi, S; Kaxiras, E; Effects of Knudsen diffusivity on the effective reactivity of nanoporous catalyst media (2016), Journal of Computational Science 17, pp. 377-383.
- **Prestininzi, P**; Lombardi, V; La Rocca, M; Curved boundaries in multi-layer Shallow Water Lattice Boltzmann Methods: bounce back versus immersed boundary (2016), Journal of Computational Science, 16, pp. 16-28.
- Shinbrot, T; Rutala, M; Montessori, A; **Prestininzi, P**; Succi, S; Paradoxical ratcheting in cornstarch (2015), Physics of Fluids, 27, 10, 103101.
- Montessori, A; **Prestininzi, P**; La Rocca, M; Succi, S; Lattice Boltzmann approach for complex nonequilibrium flows (2015), Physical Review E, 92, 4, 043308.
- **Prestininzi, P**; Montessori, A; La Rocca, M; Succi, S; Reassessing the single relaxation time Lattice Boltzmann Method for the simulation of Darcy's flows (2015), International Journal of Modern Physics C, 1650037.
- La Rocca, M; Montessori, A; **Prestininzi, P**; Succi, S; A multispeed Discrete Boltzmann Model for transcritical 2D shallow water flows (2015), Journal of Computational Physics, 284, pp. 117-132.
- **Prestininzi, P**; La Rocca, M; Hinkelmann, R; Comparative study of a Boltzmann-based finite volume and a lattice Boltzmann model for shallow water flows in complex domains (2014), International Journal of Offshore and Polar Engineering, 24, 03, pp. 161-167.
- **Prestininzi, P**; La Rocca, M; Montessori, A; Sciortino, G; A gas-kinetic model for 2D transcritical shallow water flows propagating over dry bed (2014), Computers & Mathematics with Applications, 68, 4, pp. 439-453.
- Montessori, A; Falcucci, G; **Prestininzi, P**; La Rocca, M; Succi, S; Regularized lattice Bhatnagar-Gross-Krook model for two-and three-dimensional cavity flow simulations (2014), Physical Review E, 89, 5, 053317.
- **Prestininzi, P**; Sciortino, G; La Rocca, M; On the effect of the intrinsic viscosity in a two-layer shallow water lattice Boltzmann model of axisymmetric density currents (2013), Journal of Hydraulic Research, 51, 6, pp. 668-680.

## Publications on peer-reviewed international journals - continued -

- La Rocca, M; **Prestininzi, P**; Adduce, C; Sciortino, G; Hinkelmann, R; Lattice Boltzmann simulation of 3D gravity currents around obstacles (2013), International Journal of Offshore and Polar Engineering, 23, 03.
- **Prestininzi, P**; Di Baldassarre, G; Schumann, G; Bates, PD; Selecting the appropriate hydraulic model structure using low-resolution satellite imagery (2011), Advances in Water Resources, 34, 1, pp. 38-46.
- **Prestininzi, P**; Suitability of the diffusive model for dam break simulation: Application to a CADAM experiment (2008), Journal of hydrology, 361, 1, pp. 172-185.
- **Prestininzi, P**; Fiori, A, A Two-Dimensional Parabolic Model For Flood Assessment (2006), Italian Journal of Engineering Geology and Environment, 1, pp. 5-18.

## Publications on conference proceedings

- Miliani S, Montessori A, La Rocca M, **Prestininzi P** Application of a 3D LBM interface tracking model on dam-break flows, Challenges in Multiphase Flows, Prato, 2019
- Miliani S, **Prestininzi P**, La Rocca M, Montessori A, Three dimensional dam-break simulations using Lattice Boltzmann Method, - Geophysical Research Abstracts. Vol 21, EGU2019-7672, 2019. EGU General Assembly 2019, 7 - 12 aprile, Vienna, Austria
- Miliani S, **Prestininzi P**, La Rocca M, Montessori A, 3D simulations of impulsive free surface flows using the Lattice Boltzmann Method, Proceedings of the 5th IAHR Europe Congress - New Challenges in Hydraulic Research and Engineering. Ed. A. Armanini e E, Nucci. 5th IAHR Europe Congress Organizers, 2018, 12-14 June, Trento, Italy.
- Marafini E, Montessori A, **Prestininzi P**, Fiori A, La Rocca M - LBM numerical investigation of flow through fractured porous media - Geophysical Research Abstracts. Vol 21, EGU2019-7672, 2019. EGU General Assembly 2019, 7 - 12 aprile, Vienna, Austria
- Montessori A., **Prestininzi P**, Sega M., Succi S. - Extended friction elucidates the breakdown of fast water transport in graphene oxide membranes - 3rd International Conference on Desalination using Membrane Technology, 2-5 April 2017 in Las Palmas, Gran Canaria, Spain.
- Montessori A, **Prestininzi P**, La Rocca M, Falcucci G, Succi S, Lattice kinetic approach to non-equilibrium flows, International Conference Of Numerical Analysis And Applied Mathematics 2015 (Icnaam 2015), 1, AIP Publishing
- **Prestininzi, P**; Un Modello Diffusivo Applicato Al Dam Break: Un Caso Test Del Progetto Cadam, 31° Convegno Nazionale di Idraulica e Costruzioni Idrauliche, 2008.
- La Rocca, M; M, A; **Prestininzi, P**; Musumeci, R; Influence of Surface Waves on the Propagation of a Gravity Current, The Twenty-fifth International Offshore and Polar Engineering Conference, 2015, International Society of Offshore and Polar Engineers.
- La Rocca, M; **Prestininzi, P**; Mele, P; Hinkelmann, R; A Gas-Kinetic Model for Shallow Water Flows in Presence of Wet/Dry Fronts, 11<sup>th</sup> International Conference on Hydroscience & Engineering, 2014.
- **Prestininzi, P**; La Rocca, M; Hinkelmann, R; The Representation of Complex Boundaries in a Multilayer Shallow Water FV-LBE Model, The Twenty-third International Offshore and Polar Engineering Conference, 2013, International Society of Offshore and Polar Engineers.
- **Prestininzi, P**; The 2D diffusive shallow water model: validation against experimental data and integration with a 1D module to simulate a meandering river expansion., EGU General Assembly Conference Abstracts, 11, 5627, 2009.

## Other publications

- Calenda, G; Di Lazzaro, M; Fiori, A, **Prestininzi, P**; Volpi, E; Channel drops: A comparison between CFD simulations and experimental observations, Standard design of hydraulic structures in urban drainage systems, 2009.

A handwritten signature in black ink, appearing to read "P. Prestininzi", with a large, stylized initial "P" and "P" followed by "restininzi".