

Curriculum Vitae

Personal Information

First Name **Alessandro**
Family Name **IAFRATI**
Citizenship Italian
Birth 17th February, 1967
Place of Birth Rome, Italy

Work

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Appointments and Responsibilities at CNR-INM/INSEAN

Level Senior Research Scientist
Period August 2019-present
Role **Institute Director**
Activities and Responsibilities Coordinates the institute activities and is responsible, in the programming framework of the National Research Council (CNR) of the activities carried out by the institute on the research programs and projects committed to the institute. In carrying out his activities, the Director of the Institute of Marine Engineering refers to the Director of the CNR Department of Engineering, ICT and technologies for energy and transportation.

Level Senior Research Scientist
Period February 2018-present
Role **Technical Responsible of CNR-INM (*ad interim*)**
Activities and Responsibilities Supervises all the activities related to the preparation of experimental tests; coordinates all laboratories, workshops and experimental facilities in the preparation of models, instrumentation experimental setups and testing; participates to the preparation of proposals involving experimental activities for both industrial or research projects

Level Senior Research Scientist
Period March 2018-July 2019
Role **Head of testing and models laboratory**
Activities and Responsibilities Coordinates the activities in the laboratories and organize the schedule making them fitting with the schedule of the testing activities in the experimental facilities

Level Senior Research Scientist
Period 2016 – present
Role **Scientific Responsible for the High Speed Ditching Facility**
Activities and Responsibilities Management, scientific planning and design of experimental activities to be carried out on the facility; coordination of the technical personnel assigned, either permanently or temporarily, to the facility.

Level Senior Research Scientist
Period 2014 – 2018
Role **Member of the Board of CNR-INSEAN**

Level Senior Research Scientist
Period 2016 – 2019
Role **CNR-INSEAN Representative** in the Project Area DIT.AD012 (*Tecnologie per l'Aerospazio e Osservazione della Terra – Aerospace Technologies and Earth Observation*)

Appointment and Directions in INSEAN	<i>INSEAN (the Italian Ship Model Basin) has been an independent National Research Institution until 2010 when it was transformed into an institute of the National Research Council-CNR (from 1st January 2011).</i>
Role	Senior Research Scientist
Period	2009 – 2010
Role	Director of the “Resistance and Optimization” Scientific Unit
Main responsibilities	Direction of the scientific unit, preparation of the research plans and research proposals in national, international, and industrial contexts
Scientific Career	
At INSEAN or CNR-INSEAN	2003 – present: Senior Research Scientist 1997 – 2002: Research Scientist
At CIRA <i>Italian Aerospace Research Centre, Capua (CE), Italy</i>	1992 - 1997 Research Scientist
Education	
Typology	National Habilitation
Validity	from 03/02/2014 to 03/02/2020
Title	Habilitation to Full Professor, Sector 09/A1 (Aeronautical, Aerospace and Naval Engineering)
Organization	Italian Ministry of Education, University and Research
Typology	PhD
Period	2008-2009
Title	PhD by Publication in Applied Mathematics
Organization	School of Mathematics, University of East Anglia (UK)
Typology	Degree (Master Degree equivalent)
Years	1985-1991
Title	Degree in Mechanical Engineering
Vote	110/110 summa cum laudae
Organization	Department of Mechanics and Aeronautics, Univ. of Rome “La Sapienza”
Scientific Activity	
Scientific Reviewer for International research agencies	<ul style="list-style-type: none"> • External Reviewer for one research proposal submitted to the <i>Research Foundation – Flanders (Fonds Wetenschappelijk Onderzoek - Vlaanderen, FWO), Belgium</i> (June 2013). • External Reviewer for one research proposal for PRACE: <i>Partnership for Advanced Computing in Europe, Belgium</i> (November 2013). • External Reviewer for one research proposal for NSERC: <i>Natural Sciences and Engineering Research Council of Canada</i>, (November 2017) • External Reviewer for one research proposal submitted to the <i>Dutch Research Council (NWO)</i> (August 2019).
Scientific Reviewer for National research agencies	<ul style="list-style-type: none"> • Technical and Scientific expert for proposals and projects of the Italian Ministry of Economic Development (2 proposals on Sustainable Growth Funds, 1 proposal on Research Investments Funds) • Reviewer of one project proposal for the PRIN (Research Projects of National Interest) – Calls of the Italian Ministry of Education

Reviewer for academic/research positions	<ul style="list-style-type: none"> • Member of the jury for the Habilitation to Research Director at Université d'Aix-Marseille, France (2016) • Member of the Doctoral Committee for Doctoral candidate at T.U. Delft, The Netherlands (2018) • Tenure reviewer for a professor position at the School of Naval Architecture, Ocean & Civile Engineering, Shanghai Jao Tong Univ. (2017, 2018)
Scientific Appointment for the National Administration	<ul style="list-style-type: none"> • Member of the Scientific Community for Innovation and Research of the Italian Ministry of Infrastructure and Transports (since November, 2015)
Scientific Appointments in International context	<ul style="list-style-type: none"> • Member of the <i>Technical Advisory Panel for International joint Research Laboratory on Offshore Oil & Gas Engineering</i> (Dalian Univ. of Technology & Univ. Western Australia), from July 2019 • Chairman of the <i>Specialist Committee on Modelling of Environmental Conditions</i>, 29th ITTC, from September 2017 to September 2020 • Chairman of the <i>Specialist Committee on Modelling of Environmental Conditions</i>, 28th ITTC, from September 2014 to September 2017 • Member of the Technical Committee on <i>Computational Fluid Dynamics</i> of the ECCOMAS - <i>European Community on Computational Methods in Applied Sciences</i> – on behalf of SIMAI – Italian Society on Applied and Industrial Mathematics (since May, 2014). http://www.eccomas.org/vpage/1/0/Committees/Computational-Fluid-Dynamics • Member of the <i>General Council dell'International Association for Computational Mechanics</i> (IACM) on behalf of the Italian Group of Computational Mechanics (GIMC) of the AIMETA - Italian Association of Theoretical and Applied Mechanics (since December, 2016). http://www.iacm.info/vpage/1/0/About-IACM/General-Council • External Associate Supervisor for Doctoral and Master Courses at the Swinburne University of Technology, Hawthorn (VI), Australia (October, 2014).
Scientific Appointments in the National Context	<ul style="list-style-type: none"> • Member (as INSEAN Representative) of the Directive Board of the SIMAI – Italian Society for Applied and Industrial Mathematics (March, 2009- March, 2013).
Organization of International Conferences	<ul style="list-style-type: none"> • Member of the Scientific Committee of the <i>IX International Conference on Computational Methods in Marine Engineering</i> (MARINE 2021), Edinburgh, Scotland, June 2021. • Organizer of the <i>International Conference on Hydroelasticity in Marine Technology</i>, Roma, Italy, 2021. • Organizer of the <i>36th International Workshop on Water Waves and Floating Bodies</i> (IWWWFB), Roma, Italy, 2021. • Member of the Scientific Committee of the <i>VIII International Conference on Computational Methods in Marine Engineering</i> (MARINE 2019), Goteborg, Sweden, May 2019. • Member of the Scientific Committee of the <i>B'WAVES 2018 Workshop – Marseille, France, May 2018</i> • Member of the Scientific Committee of the <i>19th International Conference on Ship and Shipping Research</i>, Trieste, Italy 2018. • Member of the Scientific Committee of the <i>VII International Conference on Computational Methods in Marine Engineering</i> (MARINE 2017), Nantes, France, May 2017. • Member of the Scientific Committee of the ECCOMAS 2016 – <i>European Congress on Computational Methods in Applied Sciences</i>, Crete Island, Greece, June, 2016. • Member of the International Organizing and Scientific Committee of the SuperFAST2008 – International Conference on Superfast Marine Vehicles moving above, under and in water surface, St. Petersburg, Russia, July, 2008. • Secretary and Member of the Local Organizing Committee of the <i>26th ONR Symposium on Naval Hydrodynamics</i>, Rome, Italy, September, 2006. • Member of the <i>Organizing and Paper Committee of the 19th International Workshop on Water Waevs and Floating Bodies</i>, IWWWFB, Cortona, Italy, March 2004.

- Organization of Minisymposia in International Conferences
- Organizer of the minisymposium on Water Impact and Water Entry Problems, MARINE 2019 Conference, Goteborg, May 2019
 - Organizer of the minisymposium on *Numerical Modelling of Water Entry Flows*, 7th ECFD (*European Conference on Computational Fluid Dynamics*), Glasgow, UK, June 2018
 - Co-organizer of the minisymposium on *Splashes and Slamming on Structures*, 11th EFMC (*European Fluid Mechanics Conference*) Seville, Spain, September 2016
 - Co-Organizer of the minisymposium on *Water-Structure Impact*, 11th WCCM (*World Conference on Computational Mechanics*), Barcelona, Spain, July 2014

- Visiting Research Periods (most relevant)
- *Visiting Researcher at the Faculty of Science, Engineering and Technology at Swinburne University, Hawthorn, Victoria, Australia, September 2014.*
 - *Visiting Researcher at the Department of Mathematics of the Izmir Institute of Technology, Izmir, Turkey, September 2013.*
 - *Visiting Researcher at the Department of Mathematics of the Izmir Institute of Technology, Izmir, Turkey, August 2012.*
 - *Visiting Researcher at the School of Mathematics, Univ East Anglia, UK, June 2009.*
 - *Visiting Researcher at the School of Mathematics, Univ East Anglia, UK, Maggio 2008*
 - *Visiting Researcher at the Lavrentiev Institute of Hydrodynamics – Siberian Branch Russian Academy of Science, Novosibirsk, Russia, September-October 2004*
 - *Visiting Researcher at the Lavrentiev Institute of Hydrodynamics – Siberian Branch Russian Academy of Science, Novosibirsk, Russia, September 2001.*

Referee for Scientific Journals

Reviewer for:
Applied Ocean Research, Applied Mathematical Modelling, ASME J. Fluid Engineering, Chinese Journal of Oceanology and Limnology, Communication in Applied and Industrial Mathematics, European Journal of Mechanics/B Fluids, Engineering Analysis with Boundary Elements, Engineering Applications of Computational Fluid Mechanics, Int. J. for Numerical Methods in Fluids, Int. J. of Computational Fluid Dynamics, Int. J. of Offshore and Polar Engineering (IJOPE), International Journal of Multiphase Flow, Iranian J. of Science and Technology, J. Computational Physics, J. Engineering Mathematics, J. Fluids and Structures, J. Fluid Mechanics, J. Geophysical Research - Ocean, J. Hydrodynamics, J. Marine Science and Technology, J. Ship Research, J. Sound and Vibrations, Ocean Engineering, Ocean Modelling, Physics of Fluids, Quarterly J. Mechanics and Applied Mathematics, Ships and Offshore Structures, Theoretical and Computational Fluid Dynamics.

Invited Lectures

<i>Event, Role</i>	Title
<i>1. School of Aeronautic Science and Engineering, Beihang University, Beijing (CN), September 2018</i> <i>Invited Lecturer</i>	Aircraft ditching hydrodynamic and structural aspects via numerical modeling and experimental observation
<i>2. The State Key Lab. Of Coastal and Offshore Engineering, Dalian University of Technology, Dalian (CN), September 2018</i> <i>Invited Lecturer</i>	A) Domain decomposition approaches combining potential and two-fluids Navier-Stokes models B) Two-fluids modeling of wave breaking flows: numerical methods and physical aspects
<i>3. International Summer School on Naval Architecture and Ocean Engineering, Shanghai Jiao Tong Univ. (CN), August 2018</i> <i>Invited Lecturer</i>	Analysis of the breaking induced by Modulational Instability in Wind and No-Wind conditions
<i>4. B'WAVES 2018, A workshop focused on wave breaking in oceanic and coastal waters, Ecole Centrale Marseille (FR), May-June, 2018</i> <i>Invited Speaker</i>	Analysis of the breaking induced by Modulational Instability in Wind and No-Wind conditions
<i>5. International Summer School on Naval Architecture and Ocean Engineering, Shanghai Jiao Tong Univ. (CN), August</i>	Water Impact and Fluid-Structure Interaction Aspects

2017

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| <p>6. <i>International Summer School on Naval Architecture and Ocean Engineering, Shanghai Jiao Tong Univ. (CN), August 2016</i>
<u>Invited Lecturer (2 lectures)</u></p> | <p>A) Water Entry Problems: an Overview of Physical Aspects and Investigation Methods
B) Air-sea Interaction and Energy Dissipation Processes in the Breaking of Water Waves</p> |
| <p>7. <i>B'WAVES 2016, A workshop focused on wave breaking in oceanic and coastal water, Univ. Bergen (NO), June, 2016</i>
<u>Invited Speaker</u></p> | <p>Effects of wind intensity on the wave breaking induced by the modulational instability</p> |
| <p>8. <i>Dept. Naval Arch. and Marine Engineering, Univ. of Michigan (US), November 2015</i>
<u>Invited Lecturer</u></p> | <p>High speed water entry of a flat plate: hydrodynamics and fluid-structure interaction aspects</p> |
| <p>9. <i>VI International Conference on Computational Methods in Marine Engineering (MARINE 2015), Roma (IT), June 2015</i>
<u>Plenary speaker</u></p> | <p>Highly resolved simulations of air-water interaction during the breaking of extreme waves</p> |
| <p>10. <i>Centre for Ocean Engineering, Science and Technology, Swinburne Univ. of Technology, Hawthorn, Victoria (AU), September 2014</i>
<u>Invited Lecturer</u></p> | <p>Numerical modeling of the air-water interaction in wave breaking phenomena</p> |
| <p>11. <i>B'WAVES 2014, Breaking Wave Workshop, INRIA, Bordeaux (FR), August 2014</i>
<u>Keynote Speaker</u></p> | <p>Numerical simulation of air flow above breaking waves</p> |
| <p>12. <i>Mathematics of Splashing Workshop, International Centre for Mathematical Sciences, Edinburgh (UK), May 2013</i>
<u>Invited Speaker</u></p> | <p>Splashes in water entry problems</p> |
| <p>13. <i>Workshop on air-sea interactions under tropical cyclones (hurricanes), Providence, Rhode Island (US), April 2010</i>
<u>Invited Speaker</u></p> | <p>Numerical investigation of air-water interaction in breaking</p> |
| <p>14. <i>School of Mathematics, Univ. East Anglia (UK), June 2009</i>
<u>Invited Lecturer</u></p> | <p>Air-water interaction problems modeled by a Level-Set approach</p> |
| <p>15. <i>School of Mathematics, Univ. East Anglia (UK), May 2008</i>
<u>Invited Lecturer</u></p> | <p>Non-linear free-surface flows in ship hydrodynamics</p> |
| <p>16. <i>RIAM Symposium: Analyses of Strongly Nonlinear Flows Around Moving Boundaries, Fukuoka (JP), January 2006,</i>
<u>Keynote Speaker</u></p> | <p>Numerical investigation of highly nonlinear free surface flows through interface capturing methods</p> |

Responsibility in International Research Projects

- FP7 - H2020 Projects
- **Call: H2020-MG-2016-2017, Topic: MG-3.1-2016 (RIA)**
Grant Agreement: 724139
Project: SARAH – Increased Safety and robust certification for ditching of aircrafts and helicopters
Duration: Oct 2016, Sept 2019
Total Budget: 6.636.394 Euro (100% financed),
CNR Budget: 1.292.500 Euro (100% financed)
Role within the Project: Work Package Leader for WP5 (Validation Tests)
Role within CNR: Responsible for the CNR-INSEAN activities

 - **Call: FP7-AAT-2010-RTD-1, Activity codes: AAT.2010.3.3.1 Aerostructures**
Grant Agreement: 266172
Project: SMAES – Smart Aircraft in Emergency Situations
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Duration: Feb 2011, Oct 2014

Total Budget: 5.732.493 Euro (financed 3.828.124 Euro), **CNR Budget:** 755.894 Euro (financed 567.670 Euro)

Role within the Project: *Work Package Leader per il WP4 (Experimental Campaign)*

Role within CNR: Responsible for the CNR-INSEAN activities.

Participation/ Collaboration in International Research Projects

- Collaboration in projects
- **Title:** *Combined numerical/asymptotic algorithms in fluid-structure interaction problems: flow and other aspects of dam-breaking* (translated from Turkish)
Typology/Funding Organization: TUBITAK – The Scientific and Technological Research Council of Turkey - Grant n. 111M209
Duration: October 2011 – October 2013
Total funding: 128.215 Turkish Lira
Role in the Project: Partner
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Responsibility in National Projects

- Industrial Research Projects
- **Title:** THALES-IXV – *Scaled Model Experimental Test Campaign*
Typology/Funding Organization: Contract with Thales Alenia Space-Italy on behalf of the European Space Agency (ESA)
Duration: October 2010 – March 2011
Total funding: 120.000 Euro
Role: Principal Investigator (Responsabile di Progetto), conferred by the INSEAN Director (Decreto n. 3527 of 20/10/2010).
 - **Title:** USV - *Studio della dinamica di impatto di un veicolo spaziale con comando remoto in fase di ammaraggio* (Study of the dynamics of an unmanned space vehicle during the water landing)
Typology/Funding Organization: Contract with CIRA- Italian Aerospace Research Center
Duration: February – December 2005
Total funding: 112.225 Euro
Role: Principal Investigator (Responsabile di Progetto), conferred by INSEAN Director (Decreto n. 1575, 25/1/2005).
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Participation in National Research Projects

- Flagship Project RITMARE
- **Title:** RITMARE – The Italian Research for Sea
Typology/Funding Organization: Italian Ministry of Education, University and Research
Duration: January, 2012 – December, 2016
Role:
 - Responsible for Action AZ2 (CO2 Reduction) of WP2 (Environmental Sustainability) of the sub-project SP1 (Maritime Technologies);
 - Participant to the activities of the Operative Unit UO15 of the same action;
 - Participant to the activities of the Operative Unit UO1 of the action AZ1 (Hydrelasticity) of the WP1 (Structural Integrity) of the sub-project SP1**Total funding action SP1-WP2-AZ2:** 3.300.349 Euro
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- Projects supported by the Italian Ministry of Infrastructures and Transports
- **Title:** Programma Ricerche SICUREZZA 2009
Typology/Funding Organization: Italian Ministry of Infrastructures and Transports
Duration: January 2009 – December 2009
Role: Participant
 - **Title:** Programma Ricerche INSEAN 2007 2009
Typology/Funding Organization: Italian Ministry of Infrastructures and Transports
Total funding: 856.250 Euro
Budget for the Operative Unit: 371.250 Euro
Duration: May 2007 – December 2009

Role: Participant

- **Title:** Programma Ricerche INSEAN Luglio 2006- Dicembre 2007
Typology/Funding Organization: Italian Ministry of Infrastructures and Transports
Total funding: 1.447.500 Euro
Budget for the Operative Unit: 298.014 Euro
Duration: July 2006 – December 2007
Role: Participant
 - **Title:** Programma Ricerche SICUREZZA 2006-2008
Typology/Funding Organization: Italian Ministry of Infrastructures and Transports
Total funding: 1.174.871 Euro
Duration: June 2006 – December 2008
Role: Participant
 - **Title:** Programma Ricerche SICUREZZA 2003-2005
Typology/Funding Organization: Italian Ministry of Infrastructures and Transports
Total Funding: 1.160.180 Euro
Duration: July 2003 – December 2005
Role: Participant
 - **Title:** Programma Ricerche INSEAN 2000-02
Typology/Funding Organization: Italian Ministry of Infrastructures and Transports
Total Funding: 6.864.170 Euro
Budget for the Operative Unit: 1.868.668 Euro
Duration: January 2000 – December 2002
Role: Participant
 - **Title:** Programma Ricerche INSEAN 1997-99
Typology/Funding Organization: Italian Ministry of Infrastructures and Transports
Total Funding: 5.577.734 Euro
Budget for the Operative Unit: 1.812.764 Euro
Duration: January 1998 – December 1999
Role: Participant
- Research Project at CIRA
- **Titolo:** JENBAR – *Jet Noise Basic Research*
Typology/Funding Organization: Self-financed
Duration: September 1992 – May 1997
Role: Participant

Other Roles

Teaching Activity

- Courses
- 2003-08, Professorship – Numerical Analysis, Degree in Mechanical/Electric Engineering, Univ. “La Sapienza”
 - 1996-2000, Professorship – Fluid Dynamics, Diploma course in Mechanical Engineering, Univ. of Cassino