CURRICULUM VITAE

EUROPEAN CURRICULUM VITAE FORMAT

PERSONAL INFORMATION

Name	**MOLA ANDREA**
E-mail	**andrea.mola@imtlucca.it**
Nationality	Italian

WORKING EXPERIENCE

• From – to	01/06/2022 – CURRENT DATE
• For	Scuola IMT Alti Studi, Lucca
• Field	Research
• Kind of job	Tenured Assistant Professor (Ricercatore a Tempo Determinato di tipo B)
• Task	Development and application of reduced order models for limited computational cost of large scale solid and fluid dynamic simulations based on partial differential equations. Analysis of the application of fully data driven reduced order models to large scale systems of ordinary differential equations arising in the fields of computer science, control theory, economy and micro-biology. Study of potential flow models for the simulation of fluid-structure interaction problems in sailing.
• From – to	01/09/2021 – 31/05/2022
• For	Scuola IMT Alti Studi, Lucca
• Field	Research
• Kind of job	Non Tenured Assistant Professor (Ricercatore a Tempo Determinato di tipo A)
• Task	Development and application of reduced order models for limited computational cost of large scale solid and fluid dynamic simulations based on partial differential equations. Analysis of the application of fully data driven reduced order models to large scale systems of ordinary differential equations arising in the fields of computer science, control theory, economy and micro-biology.
• From – to	01/06/2021 – 31/08/2022
• For	Scuola Internazionale Superiore Studi Avanzati/ International School for Advanced Studies, Trieste
• Field	Research
• Kind of job	Research Cooperation
• Task	Involved in the project SAFE (Realtime Damage Manager and Decision Support):the project, funded by Regione Friuli Venezia Giulia is focused on the design and realization of tools and methodologies for dynamic quantification of a damage occurring on a ship.
• From – to	01/06/2018 – 31/05/2021
• For	Scuola Internazionale Superiore Studi Avanzati/ International School for Advanced Studies, Trieste
• Field	Research
• Kind of job	Non Tenured Assistant Professor (Ricercatore a Tempo Determinato di tipo A)
• Task	Involved in the project UBE2: Underwater Blue Efficiency 2, Funded by Regione Friuli Venezia Giulia. Contributed to shaping, writing and acquiring funding for the project, which entirely covered the cost of the Professor Assistant position. Along with contributing to the project management, the following research activities are being

	carried out. Development of models for the simulation of the flow past ship and boat hulls. Development of open source based mesh generation tools on complex geometries of ship hulls. Development of geometrical parametrization and mesh generation tools for simulations of the flow past planing hulls and ship propellers. Development of reduced order models for limited computational cost simulations of the flow past planing hulls and ship propellers. Development of Higher Order Spectral analysis tools to investigate insurgence in vibration on yacht hull.
• From – to	15/03/2015 – 30/05/2018
• For	Scuola Internazionale Superiore Studi Avanzati/ International School for Advanced Studies, Trieste
• Field	Research
• Kind of job	PostDoc
• Task	Involved in the project SOPHYA: Seakeeping of Planing Hull Yachts, Funded by Regione Friuli Venezia Giulia. Also involved in the project PRELICA: Metodologie Avanzate per la Progettazione dell'Elica Navale, Funded by Regione Friuli Venezia Giulia. Contributed to shaping, writing and acquiring funding for both projects, which combined, entirely covered the cost of the PostDoc Assistant position, as well as the cost of other research positions in the department. Along with contributing to the project management, the following research activities have been carried out. Development of models for the simulation of the flow past ship and boat hulls. Development of open source based mesh generation tools on complex geometries of ship hulls. Development of geometrical parametrization and mesh generation tools for simulations of the flow past planing hulls and ship propellers. Development of reduced order models for limited computational cost simulations of the flow past planing hulls and ship propellers.
• From – to	01/03/2017 – 01/04/2017
• For	MOXOFF s.r.l.
• Field	Research
• Kind of job	Research Consultant through SISSA MathLab
• Task	Involvement in the submission of a project proposal for a Phase 2 Small Medium Enterprise (SME) Horizon 2020 funding instrument. The counseling activity has been funded by the success of the submission of the corresponding Phase 1 project proposal. The Phase 2 project has been completed and submitted. It is currently under review.
• From – to	02/02/2011 – 10/03/2015
• For	Scuola Internazionale Superiore Studi Avanzati/ International School for Advanced Studies, Trieste
• Field	Research
• Kind of job	PostDoc
• Task	Involved in the project OpenSHIP: Simulazioni di fluidodinamica computazionale (CFD) di alta qualità per le previsioni di prestazioni idrodinamiche del sistema carena-elica in ambiente OpenSOURCE., Funded by Regione Friuli Venezia Giulia. Also involved in the project OpenViewShip, successor of the previous project, Funded by Regione Friuli Venezia Giulia. The research duties involved the development of a BEM software for the simulation of the water potential flow past ship hulls and propellers. The software is directly interfaced with CAD data structures, and automatically generates the computational grid starting from the CAD model of the hull. The entire software is based on open source libraries.
• From – to	01/07/2014 – 01/03/2015
• For	MOXOFF s.r.l.
• Field	Research
• Kind of job	Research Consultant
• Task	Study and modeling of the fluid dynamics and heat exchange of methane combustion in glass furnaces.
• From – to	15/05/2014 – 15/06/2014
• For	MOXOFF s.r.l.

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• Field	Research
• Kind of job	Research Consultant through SISSA MathLab
• Task	Contribution to the implementation of a software for the simulation of the static and dynamic behavior of 1D beams in large displacement conditions.
• From – to	01/08/2010 – 31/01/2011
• For	MOXOFF s.r.l.
• Field	Research
• Kind of job	Research Consultant
• Task	Study and modeling of Olympic rowing boats dynamics; numerical study of fluid-structure interaction problems in industrial packaging systems.
• From – to	20/08/2007 – 15/06/2010
• For	Department of Engineering Science and Mechanics, Virginia Polytechnic Institute and State University
• Field	Teaching and Research
• Kind of job	PhD
• Task	Study and modelling of olympic rowing boats dynamics; numerical study of the wind flow past lighting poles.
• From – to	15/03/2009 – 30/07/2009
• For	Scuola Internazionale Superiore Studi Avanzati/ International School for Advanced Studies, Trieste
• Field	Research
• Kind of job	Software development
• Task	Implementation of a Fast Multipole Algorithm accelerated Boundary Element Method for the simulation of marine waves
• From – to	01/03/2005 – 24/03/2009
• For	Politecnico di Milano - Dipartimento di Matematica, Laboratorio MOX ("Modellistica e Calcolo Scientifico")
• Field	Teaching and Research
• Kind of job	PhD
• Task	Study and modelling of olympic rowing boats dynamics.
• From – to	01/05/2004 – 30/09/2004
• For	Politecnico di Milano - Dipartimento di Matematica, Laboratorio MOX ("Modellistica e Calcolo Scientifico")
• Field	Research
• Kind of job	Research Project
• Task	Numerical simulations for the study of fluid-structure interaction for crossflow cylinders.

EDUCATION

• From – to	2007-2010
• Institute	*Virginia Polytechnic Institute and State University*
• PhD in	Engineering Mechanics
• Title Obtained	PhD in Engineering Mechanics
• Result	Graduated on December 17th 2010

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• Dissertation Title	*Multi-physics and Multilevel Fidelity Modeling and Analysis of Olympic Rowing Boats Dynamics*
• Supervisor	Prof. Muhammad R. Hajj, Professor of Engineering Mechanics, Department of Engineering Science and Mechanics (Virginia Polytechnic Institute and State University)
• From – to	2005-2009
• Institute	*Politecnico di Milano*
• PhD in	Mathematical Engineering – Applied Mathematics Specialization
• Title Obtained	PhD in Mathematical Engineering
• Result	Graduated with Honors on March 24th 2009
• Dissertation Title	*Models For Olympic Rowing Boats*
• Supervisor	Prof. Luca Formaggia, Professor of Numerical Analysis, Dipartimento di Matematica (Politecnico di Milano)
• Co-supervisor	Dott. Ing. Alessandro Placido, Ufficio Tecnico Filippi Boats s.r.l.
• From – to	1996-2004
• Institute	*Politecnico di Milano*
• Graduated in	Aerospace Engineering – Aerodinamics Specialization
• Title Obtained	Master in Aerospace Engineering
• Result	*86/100*
• Final Project	Since March 2003, five months spent at Mathematics Department, Chaire de Modèlization et Calcul Scientifique, of Ecole Politechnique Federale de Lausanne" (EPFL), Switzeland. From September 2003 to June 2004, stage in Laboratorio MOX, Mathematics Department, Politecnico di Milano, Italy.
• Project Title	*Computational Fluid Dynamics for Flows Around Slender Bodies with Appendages*
• Supervisor	Prof. Alfio Quarteroni, Chaire de Modèlization et Calcul Scientifique (EPFL, Lausanne), Cattedra di Analisi Numerica (Politecnico di Milano)
• Co-supervisor	Dott. Ing. Nicola Parolini, Chaire de Modèlization et Calcul Scientifique (EPFL, Lausanne)
• From – to	1991-1996
• Institute	*Liceo Scientifico Blaise Pascal, Abbiategrasso*
• Specialization	Computer Science
• Title obtained	*Diploma di Maturita' Scientifica*
• Result	*54/60*

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WORKSHOPS AND INTENSIVE COURSES

- *Fluididinamica Numerica: Metodi di Base, Sviluppi Recenti*, A. Quarteroni, L. Formaggia, Corso Formazione Permanente MOX, Politecnico di Milano, 2-5 June 2005;
- *Il Metodo degli Elementi Finiti: Fondamenti e Applicazioni Avanzate in Ingegneria*, A. Quarteroni, F. Saleri, Corso Formazione Permanente MOX, Politecnico di Milano, 19-23 September 2005;
- *Tecniche di Generazione di Griglia per il Calcolo Scientifico*, A. Quarteroni, L. Formaggia, Corso Formazione Permanente MOX, Politecnico di Milano, 21-24 November 2005;
- *Short course: Higher-Order Spectral Analysis*, M. R. Hajj, PhD course, Politecnico di Milano, 30 May -1 June 2006.

CAPABILITIES AND TECHNICAL ABILITIES

- Use of UNIX/Linux, Windows operative systems;
- Programming in Fortran 90, C++ , Python and Matlab/Octave languages;
- Use of open source C++ software libraries Deal.II, Sundials, OpenCASCADE (OCE)
- Use of the commercial software for computational mathematics Matlab, and open source softwares Gnuplot, Octave. Use of commercial softwares for numerical fluid dynamics Fluent, StarCd and Comet, and of open source software OpenFOAM;
- Use of programs of MS Office package (Word, Excel, PowerPoint) and of open source package OpenOffice;
- Use of written documents editor LATEX;
- Use of open source graphical rendering program PovRay.

LANGUAGES

MOTHER LANGUUAGE — **ITALIAN**

OTHER LANGUAGES

ENGLISH (TOEFL TEST)

- Reading — Exellent
- Writing — Exellent
- Oral — Exellent

FRENCH

- Reading — Good
- Writing — Elementar
- Oral — Good

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PUBLICATIONS

- Heltai, L., Bangerth, W., Kronbichler, M., Mola, A., Propagating geometry information to finite element computations, ACM Transactions on Mathematical Software (2021), 47(4), 1-30, DOI: 10.1145/3468428, ISSN: 0098-3500;
- Demo, N.; Tezzele, M.; Mola, A.; Rozza, G. Hull Shape Design Optimization with Parameter Space and Model Reductions, and Self-Learning Mesh Morphing (2021) J. Mar. Sci. Eng., 9 (2), 1-22, DOI: 10.3390/jmse9020185, ISSN: 2077-1312;
- Gadalla, M., Cianferra, M., Tezzele, M., Stabile G., Mola, A., Rozza G., On the comparison of LES data-driven reduced order approaches for hydroacoustic analysis (2021) Computers & Fluids, vol. 216, art. no. 104819, DOI: 10.1016/j.compfluid.2020.104819, ISSN: 0045-7930;
- Tezzele M., Demo N., Stabile G., Mola A., Rozza G. (2020). Enhancing CFD predictions in shape design problems by model and parameter space reduction. Advanced Modeling and Simulation in Engineering Sciences, vol. 7, p. 1-19, ISSN: 2213-7467, DOI: 10.1186/s40323-020-00177-y, ISSN: 2665-9638;
- Hijazi, S., Stabile, G., Mola, A., Rozza, G. Data-driven POD-Galerkin reduced order model for turbulent flows (2020) Journal of Computational Physics, 416, art. no. 109513, DOI: 10.1016/j.jcp.2020.109513, ISSN: 0021-9991;
- Hijazi, S., Stabile, G., Mola, A., Rozza, G. Non-intrusive polynomial chaos method applied to full-order and reduced problems in computational fluid dynamics: A comparison and perspectives (2020) In: (a cura di): D'Elia M. Gunzburger M. Rozza G., Quantification of Uncertainty: Improving Efficiency and Technology Lecture Notes in Computational Science and Engineering, 137, pp. 217-240. DOI: 10.1007/978-3-030-48721-8_10, ISSN: 1439-7358, ISBN: 978-3-030-48720-1;
- Tezzele, M., Salmoiraghi, F., Mola, A., Rozza, G. (2018). Dimension reduction in heterogeneous parametric spaces with application to naval engineering shape design problems. Advanced Modeling and Simulation in Engineering Sciences, vol. 5, p. 1-19, DOI: 10.1186/s40323-018-0118-3, ISSN: 2213-7467;
- Dassi, F., Mola, A., Si, H. Curvature-adapted remeshing of CAD surfaces (2018) Engineering with Computers, 34 (3), pp. 565-576. DOI: 10.1007/s00366-017-0558-2, ISSN: 0177-0667;
- Giuliani, N., Mola, A., Heltai, L. (2018). pi-BEM: A flexible parallel implementation for adaptive, geometry aware, and high order boundary element methods. Advances in Engineering Software, vol. 121, p. 39-58, DOI: 10.1016/j.advengsoft.2018.03.008, ISSN: 0965-9978;
- Pigazzini, R., Contento, G., Martini, S., Puzzer, T., Morgut, M., Mola, A. VIV analysis of a single elastically-mounted 2D cylinder: Parameter Identification of a single-degree-of-freedom multi-frequency model (2018) Journal of Fluids and Structures, 78, pp. 299-313. DOI: 10.1016/j.jfluidstructs.2018.01.005, ISSN: 0889-9746;
- Stabile, G., Hijazi, S., Mola, A., Lorenzi, S., Rozza, G. (2017). POD-Galerkin reduced order methods for CFD using Finite Volume Discretisation: vortex shedding around a circular cylinder. Communications in Applied and industrial Mathematics, vol. 8, p. 210-236, DOI: 10.1515/caim-2017-0011, ISSN: 2038-0909;
- Mola, A., Heltai, L., De Simone, A. (2017). Wet and dry transom stern treatment for unsteady and nonlinear potential flow model for naval hydrodynamics simulations. Journal of Ship Research, vol. 61, p. 1-14, DOI: 10.5957/JOSR.61.1.160016, ISSN: 0022-4502;
- Giuliani, N., Mola, A., Heltai, L., Formaggia, L. (2015). FEM SUPG stabilisation of mixed isoparametric BEMs: application to linearised free surface flows. Enngineering Analysis with Boundary Elements, vol. 59, p. 8-22, DOI: 10.1016/j.enganabound.2015.04.006, ISSN: 0955-7997;
- Mola, A., Heltai, L., De Simone, A. (2013). A stable and adaptive semi-Lagrangian potential model for unsteady and nonlinear ship-wave interactions. Enngineering Analysis with Boundary Elements, vol. 37, p. 128-143, DOI: 10.1016/j.enganabound.2012.09.005, ISSN: 0955-7997;
- Mola, A., Ghommem, M., Hajj, R. M. (2011), Multi-physics modelling and sensitivity analysis of olympic rowing boat dynamics, Journal of Sports Engineering, vol 14(2-4), p.85-94, DOI: 10.1007/s12283-011-0075-2, ISSN: 1369-7072;
- Formaggia, L., Mola, A., Parolini, N., Pischiutta, M. (2010). A three-dimensional model for the dynamics and hydrodynamics of rowing boats. Proceedings of the Institution of Mechanical Engineers. Part P, Journal of Sports Engineering and Technology, vol. 224, p. 51-61, DOI: 10.1243/17543371JSET46, ISSN: 1754-3371;

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PUBLICATIONS

- Formaggia, L., Miglio, E., Mola, A., Montano, A. (2009). A model for the dynamics of rowing boats. International Journal for Numerical Methods in Fluids, vol. 61, p. 119-143, DOI: 10.1002/fld.1940, ISSN: 0271-2091;
- Mola, A., Bordonaro G., Hajj R. M. (2009). Low-Frequency Variations of Force Coefficients on Square Cylinders with Sharp and Rounded Corners. Journal of Structural Engineering, vol. 135, p. 828-835, DOI: 10.1061/(ASCE)ST.1943-541X.0000034, ISSN: 0733-9445;
- Formaggia, L., Miglio, E., Mola, A., Scotti, A., Numerical simulation of the dynamics of boats by a variational inequality approach (2009) Springer Optimization and Its Applications, 33, pp. 213-227, DOI: 10.1007/978-0-387-95857-6_12, ISSN: 1931-6828, ISBN: 9780387958569;
- Formaggia, L., Miglio, E., Mola, A., Parolini N. (2008). Fluid-structure interaction problems in free surface flows: application to boat dynamics. International Journal for Numerical Methods in Fluids, vol. 56, p. 965-978, DOI: 10.1002/fld.1940, ISSN: 0271-2091;
- Marra, A. Mola, A., L. Quartapelle L. P. , Riviello L. (2004). Calculation of Impulsively Started Incompressible Viscous Flows. International Journal for Numerical Methods in Fluids, vol. 46, p. 877-902, doi: 10.1002/fld.743, ISSN: 0271-2091.

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CONFERENCE PAPERS

- Tezzele, M., Demo, N., Gadalla, M., Mola, A., Rozza, G. Model order reduction by means of active subspaces and dynamic mode decomposition for parametric hull shape design hydrodynamics (2020) Technology and Science for the Ships of the Future - Proceedings of NAV 2018: 19th International Conference on Ship and Maritime Research, pp. 569-576. DOI: 10.3233/978-1-61499-870-9-569, ISBN: 978-1-61499-869-3;
- Cangelosi, D., Bonvicini, A., Nardo, M., Mola, A., Marchese, A., Tezzele, M., Rozza, G.SRTP 2.0 - The evolution of the safe return to port concept (2020) Technology and Science for the Ships of the Future - Proceedings of NAV 2018: 19th International Conference on Ship and Maritime Research, pp. 665-672. DOI: 10.3233/978-1-61499-870-9-665, ISBN: 978-1-61499-869-3;
- Rozza, G., Malik, M.H., Demo, N., Tezzele, M., Girfoglio, M., Stabile, G., Mola, A. Advances in reduced order methods for parametric industrial problems in computational fluid dynamics (2020) Proceedings of the 6th European Conference on Computational Mechanics: Solids, Structures and Coupled Problems, ECCM 2018 and 7th European Conference on Computational Fluid Dynamics, ECFD 2018, pp. 59-76;
- Demo, N. Tezzele, M., Mola, A., Rozza, G. (2019). A complete data-driven framework for the efficient solution of parametric shape design and optimisation in naval engineering problems. In: (a cura di): Rickard Bensow;Jonas Ringsberg, VIII International Conference on Computational Methods in Marine Engineering : MARINE 2019. p. 111-121, Barcelona, Spain:International Center for Numerical Methods in Engineering (CIMNE), Göteborg, Sweden, 13 May 2019 - 15 May 2019, ISBN: 978-84-949194-3-5;
- Mola A., Tezzele M., Gadalla M., Valdenazzi F., Grassi D., Padovan R., Rozza G. (2019). Efficient reduction in shape parameter space dimension for ship propeller blade design. In: (a cura di): Rickard Bensow Jonas Ringsberg, VIII International Conference on Computational Methods in Marine Engineering : MARINE 2019. p. 201-212, Barcelona, Spain:International Center for Numerical Methods in Engineering (CIMNE), Gothenburg, Sweden, 13 May 2019-15 May 2019, ISBN: 978-84-949194-3-5;
- Demo, N., Tezzele, M., Mola, A., Rozza, G. An efficient shape parameterisation by free-form deformation enhanced by active subspace for hull hydrodynamic ship design problems in open source environment (2018) Proceedings of the International Offshore and Polar Engineering Conference, 2018-June, pp. 565-572, ISSN: 1098-6189, ISBN: 978-188065387-6;
- Tezzele, M., Demo, N., Gadalla, M., Mola, A., Rozza, G. Model order reduction by means of active subspaces and dynamic mode decomposition for parametric hull shape design hydrodynamics (2018) NAV International Conference on Ship and Shipping Research, (221499), pp. 569-576. DOI: 10.3233/978-1-61499-870-9-569, ISBN: 978-1-61499-869-3;
- Cangelosi, D., Bonvicini, A., Nardo, M., Mola, A., Marchese, A., Tezzele, M., Rozza, G. SRtP 2.0 — The evolution of the safe return to port concept (2018) NAV International Conference on Ship and Shipping Research, (221499), pp. 665-672. DOI: 10.3233/978-1-61499-870-9-665, ISBN: 978-1-61499-869-3;
- Mola, A., Heltai, L., De Simone, A. Ship sinkage and trim predictions based on a CAD interfaced fully nonlinear potential model (2016) Proceedings of the International Offshore and Polar Engineering Conference, , Rhodes, Greece, June 26-July 1 2016, pp. 511-518, ISSN: 1098-6189, ISBN: 978-1-880653-88-3;
- Salmoiraghi, F., Ballarin, F., Corsi, G., Mola, A., Tezzele, M., Rozza, G. Advances in geometrical parametrization and reduced order models and methods for computational fluid dynamics problems in applied sciences and engineering: overview and perspectives. In: (a cura di): Stefanou G.Papadopoulos V.Plevris V.Papadrakakis M., Proceedings of the ECCOMAS Congress 2016, 7th European Conference on Computational Methods in Applied Sciences and Engineering, Crete Island,Greece, June 5-10, 2016. vol. 1, p. 1013-1031, Athenes:Institute of Structural Analysis and Antiseismic Research School of Civil Engineering National Technical University of Athens (NTUA) Greece, Crete, Greece, 5–10 June 2016, DOI: 10.7712/100016.1867.8680, ISBN: 978-618-82844-0-1;
- Mola, A., Heltai, L., De Simone, A. Nonlinear free surface potential flow simulations for hulls with a transom stern operating in dry and wet conditions (2015) 18th International Conference on Ships and Shipping Research, NAV 2015, pp. 149-159;
- Dassi, F., Mola, A., Si, H. Curvature-adapted remeshing of CAD surfaces (2014) Procedia Engineering, 82, pp. 253-265. DOI: 10.1016/j.proeng.2014.10.388;
- Mola, A., Heltai, L., DeSimone, A. A fully nonlinear potential model for ship hydrodynamics directly interfaced with CAD data structures. In: The 24th International Ocean and Polar Engineering Conference. vol. 4, p. 815-823, Cupertino, California:International Society of Offshore and Polar Engineers (ISOPE), Busan, Korea, June 15-20, 2014, ISBN: 978-

188065391-3;

- Mola, A., Heltai, L., De Simone, A. A stable semi-lagrangian potential method for the simulation of ship interaction with unsteady and nonlinear waves. In: (a cura di): Visconti I.C.Trieste M., NAV 2012 17th International Conference on Ships and Shipping Research. p. 1-9, Associazione Italiana di Tecnica Navale, October 17, 2012 – October 19, 2012, ISSN: 2282-8397;
- Mola A., Ghommem M., Hajj M. R. (2010). Sensitivity analysis of the performance of olympic rowing boats. In: 13th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference 2010. p. 1-10, American Institute of Aeronautics and Astronautics, Ft. Worth, TX, usa, 13 September 2010 through 15 September 2010, doi: 10.2514/6.2010-9395, ISBN: 978-1-60086-954-9;
- Taliercio, A., Veber, D., Mola, A. Numerical solutions for some axisymmetric elastic micropolar orthotropic bodies (2008) Civil-Comp Proceedings, 88.
- Mola, A, Formaggia, L., Miglio, E. (2006). Simulation of the dynamics of an olympic rowing boat. In: Proceedings of ECCOMAS CFD 2006. p. 1-10, Egmond aan Zee, The Netherlands, ISBN: 9789090209708.

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CONFERENCE PRESENTATIONS

- **Mola, A.**, Formaggia, L., Miglio, E. Del Grosso, L., Performance prediction of Olympic rowing boats accounting for full dynamics, SIMAI 2006 conference, Baia Samuele (Ragusa), May 22-26 2006.
- **Mola, A.**, Formaggia, L., Miglio, E. Simulation of the dynamics of an olympic rowing boat, ECCOMAS CFD 06 conference, Egmond aan Zee, The Netherlands, September 5-8 2006.
- **Mola, A.**, Bordonaro G., Hajj R. M. Unsteady aerodynamic forces on square cylinders with sharp and rounded corners, Sixth International Colloquium on Bluff Body Aerodynamics & Applications, Milano, July 20–24 2008.
- **Mola, A.**, Heltai, L., De Simone A. A.Stability investigation of semi-Lagrangian approach in a fully nonlinear potential model for free surface waves, Iabem2011, Symposium of the The International Association for Boundary Element Methods, Brescia September 5-8 2011.
- **Mola, A.**, Heltai, L., De Simone A. Automatic, hierarchic and adaptive mesh generation on CAD surfaces for BEM simulations of ship hydrodynamics, SIMAI 2012 conference, Torino, June 25-28 2012.
- **Mola, A.**, Heltai, L., De Simone A. A stable semi-Lagrangian potential method for the simulation of ship interaction with unsteady and nonlinear waves, NAV, the 17th International Conference on Ships and Shipping Research, Napoli, October 17-19 2012.
- **Mola, A.**, Miglio E., Formaggia, L. A Model for the Simulation of Rowing Boats Dynamics in Race Conditions, Winter Universiade Conference 2013: International Interdisciplinary Conference on University Sport, Rovereto, December 9-10 2013.
- **Mola, A.**, Heltai, L., De Simone A. A Fully Nonlinear Semi-Lagrangian Potential Model for Ship Hydrodynamics Simulations Directly Interfaced with CAD Data Structures, ISOPE, The 24th International Ocean and Polar Engineering Conference, Busan June 15-20 2014.
- **Mola, A.**, Heltai, L., De Simone A. Nonlinear free surface potential flow simulations for hulls with a transom stern operating in dry and wet conditions, NAV, the 18th International Conference on Ships and Shipping Research, Lecco, June 24-26 2015.
- **Mola, A.**, Heltai, L., De Simone A. Ship Sinkage and Trim Predictions Based on a CAD Interfaced Fully Nonlinear Potential Model, ISOPE, The 26th International Ocean and Polar Engineering Conference, Rhodes June 26-July 2 2016.
- Tezzele, M., Salmoiraghi, F., **Mola, A.**, Rozza G, .Dimension reduction in heterogeneous parametric spaces: a naval engineering case, IACM 19th International Conference on Finite Elements in Flow Problems – FEF, Roma, April 5-7, 2017.
- Demo, N., Tezzele, M., **Mola, A.**, Rozza, G. An efficient shape parameterisation by free-form deformation enhanced by active subspace for hull hydrodynamic ship design problems in open source environment, The 28th International Offshore and Polar Engineering Conference, Sapporo, June 10-15 2018.
- **Mola A.**, Tezzele M., Gadalla M., Valdenazzi F., Grassi D., Padovan R., Rozza G. Efficient Reduction in Shape Parameter Space Dimension for Ship Propeller Blade Design, MARINE 2019, VIII International Conference on Computational Methods in Marine Engineering, Goteborg, May 13-15, 2019.
- **Mola, A.**, Tezzele, M., Hijazi, S., Demo, N., Stabile, G., Rozza, G. Shape Parameterization And Model Reduction Applications For Naval Hydrodynamics Problems, 14th World Congress on Computational Mechanics (WCCM) ECCOMAS Virtual Congress 2020, January 11-15 2021
- Demo, N., **Mola, A.**, Rozza, G., Tezzele, M. Model Order Reduction Applications in Computational Fluid Dynamics Simulations for Ship Design, the 9th Conference on Computational Methods in Marine Engineering (Marine 2021), Virtual Congress, June 2-4 2021.
- **Mola A.**, Tezzele M., Demo, N., Rozza, G. The application of reduced order models to computational fluid dynamics simulations for ship design, SIMAI 2020+21, the XV Biannual Congress of SIMAI, Parma, Italy, 30 August - 3 September 2021;

CURRICULUM VITAE

EUROPEAN CURRICULUM VITAE FORMAT

TEACHING EXPERIENCE AND DUTIES

- Assistant for the course *Metodi Numerici per il Design,* 10.00 CFU, Laurea Triennale in Design della Comunicazione, Prof. Edie Miglio, Academic Years 2005-2006, 2006-2007, Facoltà di Disegno Industriale, Politecnico di Milano;
- Computer Science Laboratory Assistant for the course A*nalisi Matematica A e Geometria*, 10.00 CFU, Laurea Triennale in Ingegneria Matematica e Ingegneria Fisica, Prof. M. Grasselli, in years 2005-2006, 2006-2007, Facoltà di Ingegneria Matematica, Politecnico di Milano;
- Teaching Assistant for the laboratory of the 3 credits course *Intro Fluid Mechs*, Prof. M. R. Hajj, Academic Year 2007-2008 Fall and Spring semester, Bachelor of Science in Engineering Science and Mechanics and Mining Engineering, Department of Engineering Science and Mechanics, Virginia Polytechnic School and State University;
- Instructor for the 1 credit course *Intro Fluid Mechanics Laboratory*, Academic Year 2008-2009 Fall semester, Bachelor of Science in Engineering Science and Mechanics and Mining Engineering, Department of Engineering Science and Mechanics, Virginia Polytechnic School and State University.
- From 08/07/2019 to 12/07/2019 Lecturer at the Summer School "Reduced Order Methods in Computational Fluid Dynamics" at the International School for Advanced Studies (SISSA), Trieste;
- From 21/03/2022 to 28/04/2022 Lecturer for the course “Advanced Numerical Analysis”, PhD in Systems Science, Academic Year 2021-2022, Scuola IMT Alti Studi Lucca.

OTHER INSTITUTIONAL DUTIES

- From 13/09/2019 to 14/09/2019 member of the evaluation committees for the admission to the 2nd and 3rd year, respectively, of the PhD program in Mathematical Analysis Modeling and Applications at the International School for Advanced Studies (SISSA);
- From 13/09/2019 to 14/09/2019 member of the evaluation committees for the admission to the 2nd and 3rd year, respectively, of the PhD program in Mathematical Analysis Modeling and Applications at the International School for Advanced Studies (SISSA);
- From 01/10/2020 to 30/09/2021 First Year Tutor of Valentin Nkana Ngan, PhD in Mathematical Analysis Modeling and Applications at the International School for Advanced Studies (SISSA);
- From 09/09/2020 to 10/09/2020 member of the evaluation committee for the admission to the 4th year of the PhD program in Mathematical Analysis Modeling and Applications at the International School for Advanced Studies (SISSA);
- From 10/09/2020 to 11/09/2020 member of the selection committee for the admission to the PhD program in Mathematical Analysis Modeling and Applications at the International School for Advanced Studies (SISSA);
- From 01/04/2019 to 31/12/2020 member of 6 research scholarship selection committees at the International School for Advanced Studies (SISSA);
- From 01/04/2019 to 31/12/2020 member of 9 postdoc positions selection committees at the International School for Advanced Studies (SISSA).

PRIZES AND AWARDS

- 01/05/2011 Recipient of one of the Excellence Micro Grants of the International School for Advanced Studies (SISSA) for young PostDoc researchers. The amount of the grant was 3000 Euro.

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MSC THESIS AND PHD DISSERTATION MENTORIING ACTIVITY

- Co-Advisor for the Thesis of Nicola Giuliani, Politecnico di Milano, MSc in Aeronautical Engineering, Title "An hybrid boundary element method for free surface flows", advisor Prof. Luca Formaggia, 2013;
- Co-Advisor for the Thesis of Riccardo Pigazzini, Università di Trieste, MSc in Naval Architecture and Marine Engineering, Title "Analysis of 2D VIV of two circular cylinders in tandem arrangement by an open-source CFD solver", advisor Prof. Giorgio Contento, 2015;
- Co-Advisor for the Thesis of Simone Martini, Università di Trieste, MSc in Naval Architecture and Marine Engineering, Title "Analysis of 2D VIV of a single circular cylinder by an open-source CFD solver", advisor Prof. Giorgio Contento, 2015;
- Co-Advisor for the Thesis of Saddam Hijazi, Università dell'Aquila and University of Hamburg, MSc in Mathematical Modelling in Engineering (MathMods), Title "Reduced order methods for computational fluid dynamics parametric problems with finite volume discretization", advisor Prof. Gianluigi Rozza, 2016;
- Co-Advisor for the Thesis of Filippo Guido Davide Sacco, Politecnico di Milano, MSc in Mathematical Engineering, Title "A 3D adaptive boundary element method fro potential flow with nonlinear Kutta condition", advisor Prof. Nicola Parolini, 2018;
- Co-Advisor for the Dissertation of Saddam Hijazi, International School for Advanced Studies (SISSA), PhD in Mathematical Analysis Models and Applications, Title "Reduced order methods for laminar and turbulent flows in a finite volume setting: projection-based methods anddata-driven techniques", advisor Prof. Gianluigi Rozza, 2020;
- Co-Advisor for the Thesis of Anna Ivagnes, Politecnico di Torino, MSc in Mathematical Engineering, Title "Data Enhanced Reduced Order Methods for Turbulent Flows", advisor Prof. Claudio Canuto, Prof. Gianluigi Rozza, 2021.

CONTRIBUTION TO ORGANIZING WORKSHOPS AND CONFERENCES

- Member of the organizing committee of the workshop Free Surface Flows: Numerical Methodologies and Application to Naval Architecture, SISSA, 24-25 Feb. 2012;
- Involved in the organization of IACM 19th International Conference on Finite Elements in Flow Problems – FEF, Roma, April 5-7, 2017;
- Organizer of Invited Session "Model Order Reduction Methods in Marine Engineering" at the IX International Conference on Computational Methods in Marine Engineering (ECCOMAS Thematic Conference), Virtual Conference 2-4 June 2021.

SOFTWARE DEVELOPMENT

- Developer of waveBEM, C++ ship hydrodynamic simulation solver based on fully nonlinear potential model discretized via Boundary Element Method (BEM) (https://github.com/mathLab/WaveBEM);
- Developer of π-BEM, C++ library for parallel Boundary Element Method (BEM) implementation (https://github.com/mathLab/pi-BEM);
- Developer of PyGeM, python library of shape parameterization algorithms interfaced with multiple geometrical (CAD) and mesh formats (https://github.com/mathLab/PyGeM);
- Developer of BladeX, python library for the design and shape parameterization of propeller blades (https://github.com/mathLab/BladeX);
- Contributor to deal.II, C++ library for Finite Element Method implementation. Contribution focused on CAD interface and coresponding tutorial Step 54 (https://www.dealii.org/developer/doxygen/deal.II/step_54.html)

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RECORD OF INVOLVEMENT IN SUBMISSION AND MANAGEMENT OF FUNDED RESEARCH PROJECTS

- **Calcolo scientifico per le scienze naturali, sociali e applicazioni: sviluppo metodologico e tecnologico,** funded by Programmazione Triennale delle Sei Scuole ad Ordinamento Speciale (PRO3) nell'ambito del programma congiunto. Member of the research unit at Scuola IMT Alti Studi Lucca;
- **Advanced Sealing System**, funded by Bando Innovazione, Ricerca Industriale e Sviluppo Sperimentale propoted by SMACT competence center. Contributed to shaping, writing and submitting the project, which covered the full cost of a one year PostDoc position at SISSA mathLab. SISSA mathLab is a partner of the project (P.I. Prof. Gianluigi Rozza), which is coordinated by Galdi s.r.l. and is running between Nov 2021 to Nov 2022;
- **UBE2**: Underwater Blue Efficiency 2, funded by Regione Friuli Venezia Giulia with POR-FESR funding intrument. Contributed to shaping, writing and submitting the project, which entirely covers the cost of the non tenured Assistant Professor position at SISSA mathLab currently occupied. SISSA mathLab is a partner of the project (P.I. Prof. Gianluigi Rozza), which is coordinated by MICAD s.r.l. and is running between Dec 2018 to July 2021;
- **Bormioli Pharma HeAD FSE**: Studio di modelli CFD per la gestione e la progettazione dei bacini fusori di vetro, funded by Regione Friuli Venezia Giulia with HeAD FSE funding instrument. Contributed to shaping, writing, submitting and managing the project, which covered part of the cost of a 2 years PostDoc position at SISSA mathLab. The P.I. of the project, which lasted from Sep. 2018 to Aug. 2020, was Prof. Gianluigi Rozza;
- **SaaStified**: Simulation-as-a-Service Tool for Industrial Furnaces Innovative Engineering Design, funded with Phase 1 Small Medium Enterprise (SME) Horizon 2020 funding instrument. Contributed to shaping, writing, submitting and managing the project. The corresponding Phase 2 SaaStified proposal was above threshold but was not funded. The project was coordinated by MOXOFF S.p.A. and run between Nov. 2016 and Apr. 2017;
- **SOPHYA**: Seakeeping of Planing Hull Yachts, funded by Regione Friuli Venezia Giulia with POR-FESR funding instrument. Contributed to shaping, writing, submitting and managing the project, which covered part of the cost of the PostDoc position at SISSA mathLab occupied at the time, as well as part of the cost of other research positions in the department. SISSA mathLab was a partner of the project (P.I. Prof. Gianluigi Rozza), which was coordinated by MICAD s.r.l. and ran between Apr. 2017 to Dec .2018;
- **PRELICA**: Metodologie Avanzate per la Progettazione dell'Elica Navale, funded by Regione Friuli Venezia Giulia with POR-FESR funding instrument. Contributed to shaping, writing, submitting and managing the project, which covered part of the cost of the PostDoc position at SISSA mathLab occupied at the time, as well as part of the cost of other research positions in the department. SISSA mathLab was a partner of the project (P.I. Prof. Gianluigi Rozza), which was coordinated by IEFLUIDS s.r.l. and ran between May 2017 to Jan. 2019.

OUTREACH

- Contributed to shaping, writing, submitting the proposal for the third party contract project WASS, Winning a Sea State (P.I. Prof. Gianluigi Rozza). Currently contributing managing the 16 months collaboration with Cetena S.p.A., which covers the cost of a one year PostDoc position at SISSA mathLab;
- Lecturer and panelist at the International School for Advanced Studies (SISSA) Student day outreach event for high school students, in Academic Years 2014-2015, 2015-2016, 2016-2017, 2017-2018, 2018-2019, 2019-2020, 2020-2021, 2021-2022;
- Contributor to the event ESOF 2020 – Scienza e Industria avanzano con la matematica applicata, September 20 2020, Narodni Dom, Trieste, Italy;
- Appeared with an interview in episode 1 of the 2019 Season of the Italian national TV channel RAI Scuola show "Magazzino 26" (https://www.raiplay.it/video/2019/09/RAISCUOLA-PT-92-MAGAZZINO-26-EPISODIO-1-30448276-6471-4fe0-a69b-4118bd2daafc.html)
- Featured scientist in a full episode of the the 2019 Season of the Italian national TV channel RAI Scuola show "Vita da ricercatore" (https://www.raiplay.it/video/2019/09/Pt-89-056b0b6b-1892-4327-8ea9-7ec3f838048e.html).