

**UNIVERSITÀ DEGLI STUDI DI MILANO**

selezione pubblica per n. 1 posto/i di Ricercatore a tempo determinato in tenure track (RTT) per il settore concorsuale 01/A5 - Analisi Numerica, settore scientifico-disciplinare MAT/08 - Analisi Numerica presso il Dipartimento di Matematica "Federigo Enriques", (avviso bando pubblicato sulla G.U. n. 93 del 05/12/2023)  
Codice concorso 5439

## **Michele Girfoglio**

### **CURRICULUM VITAE**

**(N.B. IL CURRICULUM NON DEVE ECCEDERE LE 30 PAGINE E DEVE CONTENERE GLI ELEMENTI CHE IL CANDIDATO RITIENE UTILI AI FINI DELLA VALUTAZIONE.**

**LE VOCI INSERITE NEL FACSIMILE SONO A TITOLO PURAMENTE ESEMPLIFICATIVO E POSSONO ESSERE SOSTITUITE, MODIFICATE O INTEGRATE**

**INFORMAZIONI PERSONALI (NON INSERIRE INDIRIZZO PRIVATO E TELEFONO FISSO O CELLULARE)**

<b>COGNOME</b>	<b>GIRFOGLIO</b>
<b>NOME</b>	<b>MICHELE</b>
<b>DATA DI NASCITA</b>	<b>05/06/1985</b>
<b>SITO WEB</b>	<a href="http://www.michelegirfoglio.com">http://www.michelegirfoglio.com</a>

### **TITOLI**

**TITOLO DI STUDIO**

*(indicare la Laurea conseguita inserendo titolo, Ateneo, data di conseguimento, ecc.)*

<p>Nov. 2007 – Mar. 2011 Master's degree in Astronautical and Aerospace Engineering (110/110 cum Laude) Institution: Department of Industrial Engineering - Aerospace sector, Università degli Studi di Napoli Federico II, Italy Advisor: Prof. Gennaro Cardone Co-advisor: Dr. Mario Panelli Topic: Analysis of meteorological data provided by a "kytoon" station</p> <p>Sept. 2004 – Oct. 2007 Bachelor's degree in Aerospace Engineering (110/110 cum Laude) Institution: Department of Industrial Engineering - Aerospace sector, Università degli Studi di Napoli Federico II, Italy Advisor: Prof. Giovanni Maria Carlomagno Co-advisor: Dr. Rosaria Giordano Topic: Analysis of the frequency response of the stereo PIV technique</p>
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**TITOLO DI DOTTORE DI RICERCA O EQUIVALENTI, OVVERO, PER I SETTORI INTERESSATI, DEL DIPLOMA DI SPECIALIZZAZIONE MEDICA O EQUIVALENTE, CONSEGUITO IN ITALIA O ALL'ESTERO**

*(inserire titolo, ente, data di conseguimento, ecc.)*

Mar. 2012 – May 2015

Ph.D. in Aerospace, Naval and Quality Engineering (research area: Fluid dynamics)

Institution: Department of Industrial Engineering - Aerospace sector, Università degli Studi di Napoli Federico II, Italy

Advisors: Prof. Luigi de Luca, Prof. Gennaro Coppola

Topics: Characterization of synthetic jet actuators driven by a piezoelectric disk, Global dynamics of unsteady gravitational liquid sheet flows

**CONTRATTI DI RICERCA, ASSEGNI DI RICERCA O EQUIVALENTI**

*(per ciascun contratto stipulato, inserire università/ente, data di inizio e fine, ecc.)*

Jun. 2019 – Dec. 2021

Post-doctoral research fellow

Institution: SISSA mathLab

Advisor: Prof. Gianluigi Rozza

Project: ERC CoG project AROMA-CFD

Jun. 2017 – May 2019

Post-doctoral research fellow

Institution: SISSA mathLab

Advisor: Prof. Gianluigi Rozza

Project: Fluid-structure interaction for industrial applications (Danieli 3 project (Danieli Research Center) funded by POR-FESR 2014-2020 - Activity 1.3.a – R&D).

Aug. 2015 – Jul. 2016

Post-doctoral research fellow

Institution: Department of Industrial Engineering - Aerospace sector, Università degli Studi di Napoli Federico II

Advisors: Prof. Luigi de Luca, Prof. Gennaro Coppola

Project: MATEMI: MAterials and process TEchnologies of high efficiency for innovative MIcrofusions (in collaboration with Europea Microfusioni Aerospaziali (EMA) S.p.A) funded by MIUR (PON03PE\_00111\_1)

**ATTIVITÀ DIDATTICA A LIVELLO UNIVERSITARIO IN ITALIA O ALL'ESTERO**

*(inserire periodo [gg/mm/aa inizio e fine], anno accademico, ateneo, corso laurea, numero ore, ecc.)*

Oct. 2023 / today - Lecturer

Master Course on “Applied Mathematics: an Introduction to Scientific Computing by Numerical Analysis” (48 hours)

<https://www.math.sissa.it/course/phd-course-master-course/applied-mathematics-introduction-scientific-computing-numerical-0>

Ph.D. in Mathematical Analysis, Modelling, and Applications, SISSA, Italy and Master Degree in Mathematics and Computer Science, University of Trieste, Italy

June 2023 - Lecturer

PhD Course on “Models and Applications in Computational Fluid Mechanics” (20 hours) -

<https://www.math.sissa.it/course/phd-course/models-and-applications-computational-fluid-mechanics>

Ph.D. in Mathematical Analysis, Modelling, and Applications, SISSA, Italy

June 2023 - Teaching Assistant

1 edition of the PhD Course on “Topics in computational fluid dynamics” (3 hours of exercise sessions) - <https://www.math.sissa.it/course/phd-course/topics-computational-fluid-dynamics-9>

Ph.D. in Mathematical Analysis, Modelling, and Applications, SISSA, Italy and Master in HPC, SISSA-ICTP, Italy

Lecturer: Prof. Gianluigi Rozza

Assistant: Dr. Michele Girfoglio

May 2023 / today - Teaching Assistant and Member of the evaluation committee for exams  
1 edition of the PhD Course on “Reduced Order Methods for Computational Mechanics” (8 hours of exercise sessions) -

<https://www.math.sissa.it/https%3A//www.math.sissa.it/course/phd-course/computational-mechanics-reduced-order-methods-1>

Ph.D. in Mathematical Analysis, Modelling, and Applications, SISSA, Italy and Master in HPC, SISSA-ICTP, Italy

Lecturer: Prof. Gianluigi Rozza

Assistants: Dr. Michele Girfoglio, Dr. Niccolò Tonicello

Oct. 2022 / Jan. 2023 - Teaching Assistant and Member of the evaluation committee for exams

1 edition of the PhD Course on “Applied Mathematics: an Introduction to Scientific Computing by Numerical Analysis” (12 hours of exercise sessions) - <https://github.com/luca-heltai/numerical-analysis-2022-2023>

Ph.D. in Mathematical Analysis, Modelling, and Applications, SISSA, Italy and Master in HPC, SISSA-ICTP, Italy

Lecturers: Prof. Gianluigi Rozza, Prof. Luca Heltai

Assistant: Dr. Michele Girfoglio

Jul. 2022 - Lecturer

Summer School on “Reduced Order Methods in Computational Fluid Dynamics (II edition)” (3 hours) - SISSA, Trieste, Italy

<https://indico.sissa.it/event/74/>

Lecture title: Non-intrusive data-driven reduced order model for biomedical applications

Lecture title: A Reduced Order Model for a LES filtering approach in a Finite Volume environment

Lecture title: An efficient computational framework for atmospheric and ocean flows

Jan. 2022 / today - Member of the evaluation committee for exams

PhD Course on “Numerical Solution of PDEs”

Ph.D. in Mathematical Analysis, Modelling, and Applications, SISSA, Italy and Master in HPC, SISSA-ICTP, Italy

Lecturer: Prof. Andrea Cangiani

Jan. 2022 / today - Member of the evaluation committee for exams

PhD Course on “Topics in Continuum Mechanics”

Ph.D. in Mathematical Analysis, Modelling, and Applications, SISSA, Italy and Master in HPC, SISSA-ICTP, Italy

Lecturer: Prof. Giovanni Noselli

Jul. 2019 - Lecturer

Summer School on “Reduced Order Methods in Computational Fluid Dynamics (I edition)” (1 hour) - SISSA, Trieste, Italy

<https://www.math.sissa.it/workshop/summer-school-reduced-order-methods-computational-fluid-dynamics>

Lecture title: Introduction on the Finite Volume Method and turbulence modelling

Mar. 2012 / May 2017 - Teaching Assistant and Member of the evaluation committee for exams

Master Course on “Hydrodynamic Stability” (exercise sessions)

Master degree in Astronautical and Aerospace Engineering, Università degli Studi di Napoli

Federico II, Italy  
Lecturer: Prof. Luigi de Luca  
Assistant: Dr. Michele Girfoglio

Mar. 2012 / May 2017 - Teaching Assistant and Member of the evaluation committee for exams

Master Course on "Numerical Methods for Aerospace Engineering" (exercise sessions)

Bachelor degree in Aerospace Engineering, Università degli Studi di Napoli Federico II, Italy

Lecturer: Prof. Gennaro Coppola

Assistant: Dr. Michele Girfoglio

Mar. 2012 / May 2017 - Teaching Assistant and Member of the evaluation committee for exams

Master Course on "Thermo-Fluid Dynamics" (exercise sessions)

Bachelor degree in Aerospace Engineering, Università degli Studi di Napoli Federico II, Italy

Lecturer: Prof. Luigi de Luca

Assistant: Dr. Michele Girfoglio

## **DOCUMENTATA ATTIVITÀ DI FORMAZIONE O DI RICERCA PRESSO QUALIFICATI ISTITUTI ITALIANI O STRANIERI;**

*(inserire anno accademico, ente, corso, periodo, ecc.)*

19 Nov. 2023 - 25 Nov. 2023

Visit to Department of Civil, Mechanical and Environmental Engineering (University of Trento, Italy), collaboration with Profs. D. Zardi and L. Giovannini.

Topic: Implementation in the WRF code of a new LES model

Mar. 2017 - May 2017

Collaborative Research Fellowship

Institution: Department of Industrial Engineering - Aerospace sector, Università degli Studi di Napoli Federico II, Italy

Advisor: Prof. Luigi de Luca

Project: CFD simulations of aerodynamic field around TP90 morphing flap controlled by Plasma Synthetic Jets (Horizon 2020-CleanSky)

## **ATTIVITÀ DI COACHING E SUPERVISIONE STUDENTI**

### **PostDoc**

Dec. 2023 - today Co-advisor

Postdoctoral researcher: Nikita Klyushnev

Project: Numerical simulation and reduced order modeling of aeroacoustics phenomena in blowers (in collaboration with Electrolux)

Advisor: Prof. Gianluigi Rozza

Co-advisors: Dr. Michele Girfoglio, Dr. Arash Hajisharifi

Sep. 2022 - today Co-advisor

Postdoctoral researcher: Rahul Halder

Project: Design and optimization of refrigeration systems via numerical simulations and machine learning techniques (in collaboration with Electrolux)

Advisor: Prof. Gianluigi Rozza

Co-advisors: Dr. Michele Girfoglio, Dr. Giovanni Stabile, Dr. Arash Hajisharifi

Dec. 2020 - today Co-advisor

Postdoctoral researcher: Arash Hajisharifi

Project: Design and optimization of refrigeration systems via numerical simulations and machine learning techniques (in collaboration with Electrolux)

Advisor: Prof. Gianluigi Rozza

Co-advisors: Dr. Michele Girfoglio, Dr. Giovanni Stabile

Feb. 2022 - Nov. 2023 Co-advisor  
Postdoctoral researcher: Caterina Balzotti  
Project: Reduced order methods for hemodynamics modelling  
Advisor: Prof. Gianluigi Rozza  
Co-advisors: Dr. Michele Girfoglio, Prof. Annalisa Quaini

May 2022 - Oct. 2022 Co-advisor  
Assistant researcher: Alberto Della Noce  
Project: Development of ROM for atmospheric flows  
Advisor: Prof. Gianluigi Rozza  
Co-advisors: Dr. Michele Girfoglio, Prof. Annalisa Quaini

May 2021 - May 2023 Co-advisor  
Assistant researcher: Francesco Romanò  
Project: Development of a CFD-DEM model for the description of the granulation process taking place within INNOJET VENTILUS V1000 granulator (in collaboration with Dompé farmaceutici S.p.A)  
Advisor: Prof. Gianluigi Rozza  
Co-advisors: Dr. Michele Girfoglio, Dr. Arash Hajisharifi

### **Ph.D. Theses**

Spring 2025 (expected) Co-advisor  
Student: Lander Besabe  
Degree: Ph.D. in Mathematics, University of Houston, USA  
Topic: Development of full and reduced order models for geophysical problems  
Advisor: Prof. Annalisa Quaini  
Co-advisors: Dr. Michele Girfoglio

Jan. 2025 (expected) Co-advisor  
Student: Sajad Salavatidezfouli  
Degree: Ph.D. in Mathematical Analysis, Modelling, and Applications, SISSA, Italy  
Topic: Development of advanced tools for mathematical and numerical modelling of multi-phase and multi-physical phenomena in order to improve sustainability and energy saving in refrigeration processes (PON project "Research and Innovation" - Research contracts on Green issues. Industrial Partner: Electrolux)  
Advisor: Prof. Gianluigi Rozza  
Co-advisors: Dr. Michele Girfoglio, Dr. Giovanni Stabile

Oct. 2025 (expected) Co-advisor  
Student: Pierfrancesco Siena  
Degree: Ph.D. in Mathematical Analysis, Modelling, and Applications, SISSA, Italy  
Topic: Reduced order methods for hemodynamics modelling  
Advisor: Prof. Gianluigi Rozza  
Co-advisor: Dr. Michele Girfoglio

Apr. 2022 Co-advisor  
Student: Nirav Shah  
Degree: Ph.D. in Mathematical Analysis, Modelling, and Applications, SISSA, Italy  
Topic: Coupled parameterized reduced order modelling of thermo-hydro-mechanical phenomena arising in blast furnaces (ROMSOC - H2020-MSCA-ITN-765374)  
Advisors: Prof. Gianluigi Rozza, Prof. Peregrina Quintela Estèvez (ITMATI)  
Co-advisors: Dr. Michele Girfoglio, Prof. Patricia Barral Rodiño (ITMATI), Dr. Alejandro Lengomin (AMI Arcelor Mittal)

## **Master Theses**

Oct. 2023 (expected) Co-advisor  
Student: Nicola Clinco  
Degree: Mathematical Engineering, Politecnico di Torino, Italy  
Topic: Large Eddy Simulation for geophysical problems  
Advisors: Prof. Gianluigi Rozza, Prof. Claudio Canuto  
Co-advisor: Dr. Michele Girfoglio

Apr. 2023 Co-advisor  
Student: Gaia Buccino  
Degree: Mathematical Engineering, Politecnico di Milano, Italy  
Topic: Reduced order methods for geophysical problems  
Advisors: Prof. Gianluigi Rozza, Prof. Nicola Parolini  
Co-advisor: Dr. Michele Girfoglio

Jul. 2021 Co-advisor  
Student: Pierfrancesco Siena  
Degree: Mathematical Engineering, Politecnico di Torino, Italy  
Topic: Reduced order methods for hemodynamics modelling  
Advisors: Prof. Gianluigi Rozza, Prof. Claudio Canuto  
Co-advisors: Dr. Michele Girfoglio, Dr. Francesco Ballarin

Mar. 2021 Co-advisor  
Student: Davide Papapicco  
Degree: Mathematical Engineering, Politecnico di Torino, Italy  
Topic: Reduced order methods for hyperbolic PDEs and multiphase flows  
Advisors: Prof. Gianluigi Rozza, Prof. Claudio Canuto  
Co-advisors: Dr. Michele Girfoglio, Dr. Giovanni Stabile, Dr. Nicola Demo

Jul. 2020 Co-advisor  
Student: Giuseppe Infantino  
Degree: Mathematical Engineering, Politecnico di Torino, Italy  
Topic: Reduced order methods for hemodynamics modelling  
Advisors: Prof. Gianluigi Rozza, Prof. Claudio Canuto  
Co-advisors: Dr. Michele Girfoglio, Dr. Francesco Ballarin

Febb. 2014 Co-advisor  
Student: Vincenzo Iannone  
Degree: Astronautical and Aerospace Engineering, Università di Napoli Federico II, Italy  
Topic: Global dynamics of unsteady gravitational liquid sheet flows  
Advisor: Prof. Gennaro Coppola  
Co-advisor: Dr. Michele Girfoglio

## **Bachelor Theses**

Mar. 2012 - Dec. 2015 Co-advisor  
Students: Ersilia Del Zoppo, Alice Maria Piccirillo, Claudio Lanzaro, Lorenzo Gugliotta, Mario Lauria, Mario Scognamiglio, Bruno Di Dato, Gaetano Pascarella, Federica Verde, Andrea Palumbo, Marina Mele, Concetta Rocco, Andrea Renno, Davide Alfonso Agostino Rizzo  
Degree: Aerospace Engineering, Università di Napoli Federico II, Italy  
Topic: Global dynamics of unsteady gravitational liquid sheet flows, Characterization of synthetic jet actuators driven by a piezoelectric disk  
Advisor: Prof. Luigi de Luca  
Co-advisor: Dr. Michele Girfoglio

## **Undergraduate Internships**

Febb. 2023 - June 2023 Co-advisor  
Student: Teresa Tonelli

Home University: Università degli Studi di Trieste  
Topic: Reduced order methods for hemodynamics modelling  
Advisor: Prof. Gianluigi Rozza  
Co-advisor: Dr. Michele Girfoglio

Jan. 2022 - Jun. 2022 Co-advisor  
Student: Audrey Gossard  
Home University: École des Ponts ParisTech  
Topic: Reduced order methods for hemodynamics modelling  
Erasmus+ Programme  
Advisor: Prof. Gianluigi Rozza  
Co-advisor: Dr. Michele Girfoglio

## **DOCUMENTATA ATTIVITÀ IN CAMPO CLINICO**

*(indicare, data, durata, ruolo, ente presso il quale si è prestata attività assistenziale, ecc.)*

## **REALIZZAZIONE DI ATTIVITÀ PROGETTUALE**

*(indicare, data, progetto, ecc.)*

## **ORGANIZZAZIONE, DIREZIONE E COORDINAMENTO DI GRUPPI DI RICERCA NAZIONALI E INTERNAZIONALI, O PARTECIPAZIONE AGLI STESSI**

*(per ciascuna voce inserire anno, ruolo, gruppo di ricerca, ecc.)*

- I am member of the SISSA research unit and I have collaborated to the writing for the following funded projects:

2023 - EarthSafe (Unveiling Earth's Critical Resources for Clean Energy and a Sustainable Future), MSC Doctoral Network, Units: SISSA, University of Twente, Technical University of Catalonia, Durham University.

2022 - Metodi di riduzione computazionale per le scienze applicate: focus su sistemi complessi (PI: Prof. Gianluigi Rozza), INdAM GNCS 2022, Units: SISSA, IMT Lucca, Università Cattolica del Sacro Cuore, Università di Trento, Politecnico di Milano.

2022 - Machine learning for fluid-structure interaction in cardiovascular problems: efficient solutions, model reduction, inverse problems (PI: Prof. Christian Vergara), PRIN 2022, Units: SISSA, Politecnico di Milano.

2022 - Full and Reduced order modelling of coupled systems: focus on non-matching methods and Automatic learning (FaReX) (PI: Prof. Gianluigi Rozza), PRIN 2022, Units: SISSA, Università degli studi di Brescia, Politecnico di Milano.

- I have been task coordinator and I have contributed to the development of the research lines for the following projects:

Sept 2021 - May 2022 Mathematics of clouds and climate change (PI: Prof. Annalisa Quaini), Harvard Radcliffe Fellowship, <https://www.math.uh.edu/~quaini/styled/styled-6/styled-11/>

2020 - 2023 Fusion-Inducing Liposomes for Efficient Intracellular Delivery: Continuum Models and Experiments (PI: Prof. Annalisa Quaini, Prof. Maxim Olshanskiy, Prof. Sheereen

Majd), NSF-supported project (grant DMS-1953535),  
[https://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1953535](https://www.nsf.gov/awardsearch/showAward?AWD_ID=1953535).

2020 - Advanced Numerical Techniques for Industrial Applications (PI: Prof. Simona Perotto), INdAM GNCS 2020, Units: Politecnico di Milano, SISSA, University of Pavia.

2016 - 2021 Advanced Reduced Order Modelling techniques with a focus in Computational Fluid Dynamics (AROMA-CFD, PI: Prof. Gianluigi Rozza), ERC CoG, Units: SISSA,  
<https://people.sissa.it/~grozza/aroma-cfd/>.

2018 - 2021 H2020 MSCA ITN EID ROMSOC, European Industrial Doctorate, Reduced Order Methods for Simulation, Optimization, Control. Network coordinator: TU Berlin, Industrial Partners: Danieli and Arcelor Mittal, <https://www.romsoc.eu/>

2016 - 2019 Collaborative Research: Efficient Modeling of Incompressible Fluid Dynamics at Moderate Reynolds Numbers by Deconvolution LES Filters - Analysis and Applications to Hemodynamics (PI: Prof. Annalisa Quaini, Prof. Alessandro Veneziani), NSF-supported project (grant DMS-1620384),  
[https://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1620384](https://www.nsf.gov/awardsearch/showAward?AWD_ID=1620384).

2019 - Advanced Intrusive and Non-Intrusive Model Order Reduction Techniques and Applications (PI: Prof. Gianluigi Rozza), INdAM GNCS 2019, Units: Politecnico di Milano, Politecnico di Torino, SISSA, University of Pavia, University of Trento.

2019 - Accurate Roms for Industrial Applications (ARIA), Units: SISSA, Inria, Optimad, VirtualMech, Valorem, USE, Polito, VW, PoliMI, Nurea, ESTECO, IEFluids,  
<https://project.inria.fr/aria>, <https://mathlab.sissa.it/project/aria-accurate-roms-industrial-applications>

2012 - Newtonian and viscoelastic instabilities in confined flows (PI: Prof. Luigi de Luca, Prof. Gennaro Coppola), F.A.R.O. 2012, Università degli Studi di Napoli Federico II,  
<http://www.dii.unina.it/page.php?idlivello=111&tabella=livello2&flag=pagina>.

2011 - Development of synthetic jet devices for different technological applications (PI: Prof. Luigi de Luca, Prof. Gennaro Coppola), F.A.R.O. 2011, Università degli Studi di Napoli Federico II, <http://www.dii.unina.it/page.php?idlivello=111&tabella=livello2&flag=pagina>.

## TITOLARITÀ DI BREVETTI

(per ciascun brevetto, inserire autori, titolo, tipologia, numero brevetto, ecc.)

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## ATTIVITÀ DI RELATORE A CONGRESSI E CONVEGNI NAZIONALI E INTERNAZIONALI

(inserire titolo congresso/convegno, data, ecc.)

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| <p>[T16] <b>M. Girfoglio</b>, A. Quaini, G. Rozza, Full and Reduced Order Models for the numerical simulation of mesoscale atmospheric flows (Contributed talk in a minisymposium), ECCOMAS, Lisbon, Spain (June 2024, 3 - June 2024, 7)</p> <p>[T15] <b>M. Girfoglio</b>, Model order reduction for geophysical flows (Invited seminar), Pro3 Workshop on Scientific Computing, Trieste, Italy (January 2024, 18 - January 2024, 19)</p> <p>[T14] <b>M. Girfoglio</b>, Full and Reduced Order Models for the numerical simulation of mesoscale atmospheric flows (Invited seminar), University of Trento, Italy (Nov. 2023, 23)</p> <p>[T13] <b>M. Girfoglio</b>, A. Quaini, G. Rozza, GEA: a new finite volume-based open source code for the numerical simulation of atmospheric and ocean flows (Poster), FVCA10, Strasbourg, France (October 2023, 30 - November 2023, 3)</p> <p>[T12] <b>M. Girfoglio</b>, P. Siena, C. Balzotti, A. Quaini, G. Rozza, Efficient and accurate reduced order modelling for cardiovascular applications (Invited talk in a minisymposium), COUPLED 2023, Chania, Crete, Greece (June 2023, 5 - June 2023, 7)</p> |
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- [T11] **M. Girfoglio**, G. Stabile, A. Mola, G. Rozza, An immersed boundary method in OpenFOAM for industrial applications (Contributed talk in a minisymposium), M2P - Math 2 Product, Taormina, Italy (May 2023, 30 - June 2023, 2)
- [T10] **M. Girfoglio**, A. Quaini, G. Rozza, A New Regularized Reduced Order Model for the Barotropic Vorticity Equation (Contributed talk in a minisymposium), SIAM CSE 2023, Amsterdam, Netherlands (Feb. 2023, 26 - Mar. 2023, 3)
- [T9] **M. Girfoglio**, A. Quaini, G. Rozza, An efficient computational framework for atmospheric and ocean flows (Poster), MORE 2022, Berlin, Germany (Sept. 2022, 18 - Sept. 2022, 23)
- [T8] **M. Girfoglio**, G. Rozza, A Virtual Boundary Method for industrial applications in a Finite Volume setting (Invited talk in a minisymposium), SIMAI 2020+2021, Online (Aug. 2021, 30 - Sept. 2021, 3)
- [T7] **M. Girfoglio**, P. Siena, F. Ballarin, G. Rozza, Non intrusive data-driven reduced order model for biomedical applications (Invited talk in a minisymposium), SIMAI 2020+2021, Online (Aug. 2021, 30 - Sept. 2021, 3)
- [T6] **M. Girfoglio**, A. Quaini, G. Rozza, Parametric POD-Galerkin Reduced Order Model for a Leray Model (Invited talk in a minisymposium), SIAM CSE 2021, Online (Mar. 2021, 1-5)
- [T5] **M. Girfoglio**, A. Quaini, G. Rozza, A Reduced Order Model for incompressible flows at moderate Reynolds numbers (Invited talk in a minisymposium), COUPLED 2021, Online (Jun. 2021, 13-16)
- [T4] **M. Girfoglio**, Scienza e Industria avanzano con la Matematica applicata, Science in The City Festival 2020, ESOF 2020, Trieste, Italy (Sept. 2020, 2-6)
- [T3] **M. Girfoglio**, Dynamics and instability of free interface flows: applications to industrial processes (Invited seminar), SISSA, Trieste, Italy (Dec. 2016, 12)
- [T2] **M. Girfoglio**, F. De Rosa, G. Coppola, L. de Luca, Global dynamics of transonic gravitational liquid sheet flows (Contributed talk in a minisymposium), EFMC10, Lyngby (Copenhagen), Denmark (Sept. 2014, 14-18).
- [T1] **M. Girfoglio**, F. De Rosa, G. Coppola, L. de Luca, Global dynamics of gravitational liquid sheet flows (Contributed talk in a minisymposium), AIDAA XXII, Naples, Italy (Sept. 2013, 9-12).

## ATTIVITÀ DI ORGANIZZAZIONE DI EVENTI SCIENTIFICI INTERNAZIONALI

- [C8] P.C. Africa, **M. Girfoglio** and G. Rozza, Minisymposium organizer on Efficient Numerical Methods for CFD and FSI Simulations at WCCM/PANACM 2024, Vancouver, Canada (July 2024, 21 - July 2024, 26).
- [C7] P.C. Africa, **M. Girfoglio**, S. Rathore and G. Rozza, Minisymposium organizer on Recent Developments in Model Order Reduction for Cardiovascular Modeling at ECCOMAS, Lisbon, Spain (June 2024, 3 - June 2024, 7).
- [C6] **M. Girfoglio**, A. Quaini and G. Rozza, Minisymposium organizer on Advances in numerical methods for atmosphere and ocean dynamics simulations at ECCOMAS, Lisbon, Spain (June 2024, 3 - June 2024, 7).
- [C5] A. Sanfilippo, **M. Girfoglio**, F. Ballarin and G. Rozza, Minisymposium organizer on Regularization, stabilization, and closure methods for reduced order modeling of differential equations under uncertainty at SIAM UQ 2024, Trieste, Italy (February 2024, 27- March 2024, 1).
- [C4] **M. Girfoglio**, G. Stabile. A. Mola and G. Rozza, Minisymposium organizer on Advanced computational mechanics in real-world applications at M2P - Math 2 Product, Taormina, Italy (May 2023, 30 - June 2023, 2).
- [C3] N. Parolini, G. Rozza and **M. Girfoglio**, Minisymposium organizer on Advanced numerical models for industrial applications based on the OpenFOAM library at M2P - Math 2 Product, Taormina, Italy (May 2023, 30 - June 2023, 2).
- [C2] **M. Girfoglio**, A. Quaini. G. Rozza and A. Coutinho, Minisymposium organizer on Reduced Order Models for Geophysical problems at SIAM CSE 2023, Amsterdam, The Netherlands (Feb. 2023, 26 - Mar. 2023, 3).
- [C1] G. Rozza, G Stabile and **M. Girfoglio**, Organizer and Lecturer , Summer School on Reduced Order Methods in Computational Fluid Dynamics (II Edition), Trieste, Italy (Jul. 2022, 11 - Jul. 2022, 15).

## CONSEGUIMENTO DI PREMI E RICONOSCIMENTI NAZIONALI E INTERNAZIONALI PER ATTIVITÀ DI RICERCA

(inserire premio, data, ente organizzatore, ecc.)

2020 - Award Special Mention to PhD4Innovating contest. ESOF, Trieste, Italy.

2012 - Full Ph.D. scholarship. Ph.D. course on Aerospace, Naval and Quality Engineering, Università degli Studi di Napoli Federico II, Italy.

## POSSESSO DEL DIPLOMA DI SPECIALIZZAZIONE EUROPEA RICONOSCIUTO DA BOARD INTERNAZIONALI (relativamente a quei settori concorsuali nei quali è prevista)

(indicare diploma, data di conseguimento, ecc.)

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## TITOLI DI CUI ALL'ARTICOLO 24 COMMA 3 LETTERA A) E B) DELLA LEGGE 30 DICEMBRE 2010, N. 240

(indicare se contratto di tipologia A o B, Ateneo, data di decorrenza e fine contratto, ecc.)

Jan. 2022 – today

Assistant Professor in Numerical Analysis (Ricercatore a Tempo Determinato di tipo A)

Institution: SISSA mathLab

Advisor: Prof. Gianluigi Rozza

Project: PON project “Research and Innovation” (Research contracts on Green issues).

## PRODUZIONE SCIENTIFICA

### PUBBLICAZIONI SCIENTIFICHE

(per ciascuna pubblicazione indicare: nomi degli autori, titolo completo, casa editrice, data e luogo di pubblicazione, codice ISBN, ISSN, DOI o altro equivalente)

**Total Number of citations:** 308 (Scopus), 504 (Scholar)

**H-index:** 10 (Scopus), 14 (Scholar)

#### Preprints

[P42] C. Balzotti, P. Siena, **M. Girfoglio**, Giovanni Stabile, J. D.-Pamplona, J.S.-Pallares, I.A.-Santos and G. Rozza, A Reduced Order Model formulation for left atrium flow: an Atrial Fibrillation case, submitted to Biomechanics and Modeling in Mechanobiology, 2023, <https://arxiv.org/abs/2309.10601>.

[P41] S. Salavatidezfouli, A. Hajisharifi, **M. Girfoglio**, G. Stabile and G. Rozza, Applicable Methodologies for the Mass Transfer Phenomenon in Tumble Dryers: A Review, submitted to Applied Thermal Engineering, 2023, <https://arxiv.org/abs/2304.03533>.

[P40] **M. Girfoglio**, G. Stabile, A. Mola and G. Rozza, An efficient FV-based Virtual Boundary Method for the simulation of fluid-solid interaction, submitted to Journal of Computational Physics, 2022, <http://arxiv.org/abs/2110.11756>.

#### Journal Papers

[P39] A. Hajisharifi, **M. Girfoglio**, A. Quaini and G. Rozza, A Comparison of Data-Driven Reduced Order Models for the Simulation of Mesoscale Atmospheric Flow, Finite Elements in Analysis and Design, 228, p. 104050, 2023, <https://doi.org/10.1016/j.finel.2023.104050>.

[P38] N. Clinco, **M. Girfoglio**, A. Quaini and G. Rozza, Filter stabilization for the mildly compressible Euler equations with application to atmosphere dynamics simulations, Computers and Fluids, 266, p. 106057, 2023, <https://doi.org/10.1016/j.compfluid.2023.106057>.

[P37] A. Hajisharifi, F. Romanò, **M. Girfoglio**, A. Beccari, D. Bonanni and G. Rozza, A Non-

Intrusive Data-Driven Reduced Order Model for Parametrized CFD-DEM Numerical Simulations, *Journal of Computational Physics*, p. 112355, 2023, <https://doi.org/10.1016/j.jcp.2023.112355>.

[P36] **M. Gírfoglio**, A. Quaini, and G. Rozza, Validation of an OpenFOAM-based solver for the Euler equations with benchmarks for mesoscale atmospheric modeling, *AIP Advances*, 13, p. 055024, 2023, <https://doi.org/10.1063/5.0147457>.

[P35] **M. Gírfoglio**, A. Quaini and G. Rozza, A Hybrid projection/data-driven Reduced Order Model for the Navier-Stokes equations with nonlinear filtering stabilization, *Journal of Computational Physics*, 486, p. 112127, 2023, <https://doi.org/10.1016/j.jcp.2023.112127>.

[P34] **M. Gírfoglio**, A. Quaini and G. Rozza, A linear filter regularization for POD-based reduced order models of the quasi-geostrophic equations, *Comptes Rendus Mécanique*, 351, p. 1-21, 2023, <https://doi.org/10.5802/crmeca.183>.

[P33] P. Siena, **M. Gírfoglio**, F. Ballarin and G. Rozza, Data-driven reduced order modelling for patient-specific hemodynamics of coronary artery bypass grafts with physical and geometrical parameters, *Journal of Scientific Computing*, 94, 2023, <http://dx.doi.org/10.1007/s10915-022-02082-5>.

[P32] **M. Gírfoglio**, A. Quaini and G. Rozza, A novel Large Eddy Simulation model for the Quasi-Geostrophic Equations in a Finite Volume setting, *Journal of Computational and Applied Mathematics*, 418, p. 114656, 2023, <https://doi.org/10.1016/j.cam.2022.114656>.

[P31] C. Balzotti, P. Siena, **M. Gírfoglio**, A. Quaini and G. Rozza, A data-driven Reduced Order Method for parametric optimal blood flow control: application to coronary bypass graft, *Communications in Optimization Theory*, 26, p. 1-19, 2022, <https://doi.org/10.23952/cot.2022.26>.

[P30] N. Shah, **M. Gírfoglio**, P. Quintela, G. Rozza, A. Lengomin, F. Ballarin and P. Barral, Finite element based model order reduction for parametrized one-way coupled steady state linear thermomechanical problems, *Finite Elements in Analysis & Design*, 212, p. 103837, 2022, <https://doi.org/10.1016/j.finel.2022.103837>.

[P29] **M. Gírfoglio**, F. Ballarin, G. Infantino, F. Nicolò, A. Montalto, G. Rozza, R. Scrofani, M. Comisso and F. Musumeci, Non-intrusive PODI-ROM for patient-specific aortic blood flow in presence of a LVAD device, *Medical Engineering & Physics*, 107, p. 103849, 2022, <https://doi.org/10.1016/j.medengphy.2022.103849>.

[P28] **M. Gírfoglio**, A. Quaini and G. Rozza, A POD-Galerkin reduced order model for the Navier-Stokes equations in stream function-vorticity formulation, *Computers and Fluids*, 244, 105536, 2022, <https://doi.org/10.1016/j.compfluid.2022.105536>.

[P27] D. Papapicco, N. Demo, **M. Gírfoglio**, G. Stabile and G. Rozza, The Neural Network shifted-Proper Orthogonal Decomposition: a Machine Learning Approach for Non-linear Reduction of Hyperbolic Equations, *Computer Methods in Applied Mechanics and Engineering*, 392, p. 114687, 2021, <https://doi.org/10.1016/j.cma.2022.114687>.

[P26] M. Strazzullo, **M. Gírfoglio**, F. Ballarin, T. Iliescu and G. Rozza, Consistency of the Full and Reduced Order Models for Evolve-Filter-Relax Regularization of Convection-Dominated, Marginally-Resolved Flows, *International Journal for Numerical Methods in Engineering*, 2021, <https://doi.org/10.1002/nme.6942>.

[P25] **M. Gírfoglio**, A. Quaini and G. Rozza, Pressure Stabilization Strategies for a LES Filtering Reduced Order Model, *Fluids*, 6(9), p. 302, 2021, <https://doi.org/10.3390/fluids6090302>.

[P24] **M. Gírfoglio**, L. Scandurra, F. Ballarin, G. Infantino, F. Nicolò, A. Montalto, G. Rozza, R. Scrofani, M. Comisso and F. Musumeci, Non-intrusive data-driven ROM framework for hemodynamics problems, *Acta Mechanica Sinica*, 2021, <http://doi.org/10.1007/s10409-021-01090-2>.

[P23] **M. Gírfoglio**, A. Quaini and G. Rozza, A POD-Galerkin reduced order model for a LES filtering approach, *Journal of Computational Physics*, 436, p. 110260, 2021, <http://doi.org/10.1016/j.jcp.2021.110260>.

[P22] **M. Gírfoglio**, A. Quaini and G. Rozza, Fluid-structure interaction simulations with a LES filtering approach in solids4Foam, *Communications in Applied and Industrial Mathematics*, 12(1), pp. 13-28, 2021, <http://doi.org/10.2478/caim-2021-0002>.

[P21] **M. Gírfoglio**, A. Quaini and G. Rozza, A Finite Volume approximation of the Navier-Stokes equations with nonlinear filtering stabilization, *Computers & Fluids*, 187, pp. 27-45, 2019, <https://doi.org/10.1016/j.compfluid.2019.05.001>.

[P20] **M. Gírfoglio**, F. De Rosa, G. Coppola and L. de Luca, Unsteady critical liquid sheets, *Journal of Fluid Mechanics*, 821, pp. 219-247, 2017, <http://doi.org/10.1017/jfm.2017.241>.

- [P19] L. de Luca, **M. Girefoglio**, M. Chiatto and G. Coppola, Scaling properties of resonant cavities driven by piezo-electric actuators, *Sensors and Actuators A: Physical*, 247, pp. 465-474, 2016, <http://doi.org/10.1016/j.sna.2016.06.016>.
- [P18] **M. Girefoglio**, C. S. Greco, M. Chiatto and L. de Luca, Modelling of efficiency of synthetic jet actuators, *Sensors and Actuators A: Physical*, 233, pp. 512-521, 2015, <http://doi.org/10.1016/j.sna.2015.07.030>.
- [P17] F. De Rosa, **M. Girefoglio** and L. de Luca, Global dynamics analysis of nappe oscillation, *Physics of Fluids*, 26(12), p. 122109, 2014, <http://doi.org/10.1063/1.4904752>.
- [P16] L. de Luca, **M. Girefoglio**, and G. Coppola, Modeling and Experimental Validation of the Frequency Response of Synthetic Jet Actuators, *AIAA Journal*, 52(8), 2014, <http://doi.org/10.2514/1.j052674>.
- [P15] **M. Girefoglio**, M. Chiatto and L. de Luca, Fluid-structure coupling effects in synthetic jet devices, *Aerotecnica Missili & Spazio*, 92, pp. 110-122, 2013, <http://doi.org/10.1007/BF03404669>.

### Book Chapters

- [P14] P. Siena, **M. Girefoglio** and G. Rozza, An introduction to POD-Greedy-Galerkin reduced basis method, *Reduced Order Models for the Biomechanics of Living Organs*, 2023, <https://doi.org/10.1016/B978-0-32-389967-3.00008-1>.
- [P13] P. Siena, **M. Girefoglio** and G. Rozza, Fast and accurate numerical simulations for the study of coronary artery bypass grafts by artificial neural network, *Reduced Order Models for the Biomechanics of Living Organs*, 2023, <https://doi.org/10.1016/B978-0-32-389967-3.00012-3>.
- [P12] M. Zancanaro, S. Hijazi, **M. Girefoglio**, A. Mola, G. Stabile and G. Rozza, Finite Volume-Based Reduced Order Models for Turbulent Flows, in *Advanced Reduced Order Methods and Applications in Computational Fluid Dynamics*, G. Rozza, G. Stabile, F. Ballarin (eds), SIAM, 2022, <https://epubs.siam.org/doi/10.1137/1.9781611977257.ch8>.
- [P11] Z. Zainib, P. Siena, **M. Girefoglio**, F. Ballarin, M. W. Hess and G. Rozza, Reduced Order Methods for Hemodynamics Applications, in *Advanced Reduced Order Methods and Applications in Computational Fluid Dynamics*, G. Rozza, G. Stabile, F. Ballarin (eds), SIAM, 2022, <https://epubs.siam.org/doi/10.1137/1.9781611977257.ch18>.
- [P10] L. Meneghetti, N. Shah, **M. Girefoglio**, N. Demo, M. Tezzele, A. Lario, G. Stabile and G. Rozza, A Deep Learning Approach to Improving Reduced Order Models, in *Advanced Reduced Order Methods and Applications in Computational Fluid Dynamics*, G. Rozza, G. Stabile, F. Ballarin (eds), SIAM, 2022, <https://epubs.siam.org/doi/10.1137/1.9781611977257.ch20>.
- [P9] L. de Luca, **M. Girefoglio**, M. Chiatto and G. Coppola, Characterization of Synthetic Jet Resonant Cavities, in *Flinovia - Flow Induced Noise and Vibration Issues and Aspects*, Ciappi E., De Rosa S., Franco F., Guyader J.-L. and Hambric S.A. (eds), Springer International Publishing, pp. 101-118, 2015, [https://doi.org/10.1007/978-3-319-09713-8\\_6](https://doi.org/10.1007/978-3-319-09713-8_6).

### Conference Proceedings

- [P8] **M. Girefoglio**, A. Quaini and G. Rozza, GEA: a new finite volume-based open source code for the numerical simulation of atmospheric and ocean flows, accepted for the publication in *Proceedings of Finite Volume for Complex Applications 10*, 2023, <https://arxiv.org/abs/2303.10499>.
- [P7] N. Shah, **M. Girefoglio** and G. Rozza, Thermomechanical modelling for industrial applications, *Progress in Industrial Mathematics at ECMI 2021*, [https://link.springer.com/chapter/10.1007/978-3-031-11818-0\\_28](https://link.springer.com/chapter/10.1007/978-3-031-11818-0_28).
- [P6] G. Rozza, M. H. Malik, N. Demo, M. Tezzele, **M. Girefoglio**, G. Stabile and A. Mola. Advances in Reduced Order Methods for Parametric Industrial Problems in Computational Fluid Dynamics, in *ECCOMAS ECFD 7 - Proceedings of 6th European Conference on Computational Mechanics (ECCM 6) and 7th European Conference on Computational Fluid Dynamics (ECFD 7)*, R. Owen, R. de Borst, J. Reese, and P. Chris (eds), pp. 59-76, 2018, <https://core.ac.uk/download/pdf/287450981.pdf>.
- [P5] **M. Girefoglio**, F. De Rosa, G. Coppola and L. de Luca, Singularity in transonic liquid sheet flows, in *Proceedings of AIMETA XXII*, 2015
- [P4] **M. Girefoglio**, F. De Rosa, G. Coppola and L. de Luca, Numerical visualization of nappe oscillation, in *Proceedings of 10th Pacific Symposium on Flow Visualization and Image Processing*, 2015, [https://www.psfvip10.unina.it/Ebook/web/papers/052\\_PSFVIP10.pdf](https://www.psfvip10.unina.it/Ebook/web/papers/052_PSFVIP10.pdf)

[P3] **M. Girfoglio**, F. De Rosa, G. Coppola and L. de Luca, Global eigenmodes of free-interface vertical liquid sheet flows, in Computational Methods in Multiphase Flows VII, WIT Transactions on Engineering Sciences, 79, pp. 285-295, 2013, <http://doi.org/10.2495/MPF130241>

[P2] **M. Girfoglio** and L. de Luca, Acoustic-structural coupling in the frequency response of synthetic jet devices, in Proceedings of AIMETA XXI, 2013

[P1] F. De Rosa, **M. Girfoglio**, G. Coppola and L. de Luca, Global dynamics of gravitational liquid sheet flows, in Proceedings of AIDAA XXII, 2013

#### **Dissertations**

[D3] **M. Girfoglio**, On the characterization of a synthetic jet actuator driven by a piezoelectric disk (volume A) - Unsteady gravitational liquid sheet flows (volume B), Ph.D. Thesis, Università degli Studi di Napoli Federico II, 2015, [http://www.fedoa.unina.it/10228/1/girfoglio\\_michele\\_27.pdf](http://www.fedoa.unina.it/10228/1/girfoglio_michele_27.pdf)

[D2] **M. Girfoglio**, Analysis of meteorological data provided by a “kytoon” station, Master Thesis, Università degli Studi di Napoli Federico II, 2012.

[D1] **M. Girfoglio**, Analysis of the frequency response of the stereo PIV technique, Bachelor Thesis, Università degli Studi di Napoli Federico II, 2007.

### **ULTERIORI ATTIVITA' E TITOLI DI RILIEVO PER IL SETTORE MAT/08**

#### **Open-source software development**

**GEA** - I am the maintainer and main developer of GEA (Geophysical and Environmental Applications), an open-source atmosphere and ocean modeling framework within the finite volume C++ library OpenFOAM developed at SISSA mathLab and available on GitHub <https://github.com/GEA-Geophysical-and-Environmental-Apps/GEA>

**ITHACA-FV** - I contribute to the development of ITHACA-FV, a C++ library for model order reduction based on OpenFOAM developed at SISSA mathLab and available on GitHub <https://github.com/mathLab/ITHACA-FV>

**EZyRB** - I contribute to the development of EZyRB, a python library for the data-driven model order reduction developed at SISSA mathLab and available on GitHub <https://github.com/mathLab/EZyRB>

**ARGOS** - I contributed to the development of ARGOS, the online platform developed at SISSA mathLab for the reduced order scientific computing <https://argos.sissa.it>

#### **Reviewer for International Journals**

2017 - today

Computer Methods in Applied Mechanics and Engineering (2 papers)

Advances in Computational Mathematics (2 papers)

Computer Methods in Biomechanics and Biomedical Engineering (1 paper)

Applied Mathematics and Computation (1 paper)

Finite Elements in Analysis & Design (1 paper)

International Journal of Computational Fluid Dynamics (1 paper)

Building and Environment (1 paper)

MDPI journals (Fluids, Mathematics, Applied Sciences, Computation) (4 papers)

#### **Academic Duties**

Jan. 2022 - today

Member of Mathematics Area Council at SISSA.

Jan. 2022 - today

Member of Faculty board for the PhD course in Mathematical Analysis, Modelling, and Applications at SISSA.

Jan. 2022 - today

Member of 7 selection commissions for post-doc researchers (assegni di ricerca), 5 scholarships contracts (borse di studio), 7 PhD entrance exams, 1 doctoral dissertation at SISSA and 2 "pre-laurea" dissertation at University of Trieste.

### **Other Achievements**

2023 - National scientific qualification for Associate Professor - sector 01/A5 (MAT/08 Numerical Analysis) Validity: 11/12/2023 - 11/12/2034

### **Industrial collaborations**

- I have been involved into industrial projects and technology transfer with several important industrial groups:

2017 - 2019 Danieli Research Center

<https://mathlab.sissa.it/project/danieli-3-fluid-structure-interaction-industrial-applications-%E2%80%93-por-fesr-2017>

2021 - today Electrolux Group

<https://mathlab.sissa.it/project/fridge-multiphase-cfdrom>

2021 - today Dompè Farmaceutici

<https://mathlab.sissa.it/project/modello-cfd-il-granulatore-innojet-ventulus-v1000-di-domp%C3%A8>

Data

04/01/2024

Luogo

Trieste