

FEDERICO PICHI



PERSONAL INFORMATION

Born in Rome, Italy 23 February 1992

Ph.D. in **Mathematical Analysis, Modelling and Applications**

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website <http://people.sissa.it/~fpichi/>

POSITION

Current Position

PostDoc researcher at **SISSA** (International School for Advanced Studies) and **EPFL** (École Polytechnique Fédérale de Lausanne) with CRUI fellowship. Member of **mathLab** group, Mathematics Area, via Bonomea 265, Trieste, Italy.

Research Interests

Numerical analysis of bifurcating phenomena held by non-linear equations. Reduced order models in computational Continuum Mechanics, Fluid Dynamics and Quantum Mechanics with applications to Artificial Neural Networks, Optimal Control Problems and Fluid-Structure Interaction.

PUBLICATIONS

2021

[8] “An artificial neural network approach to bifurcating phenomena in computational fluid dynamics”

Authors: F. PICHI, F. BALLARIN, G. ROZZA, J. S.HESTHAVEN.

In: [arXiv](#).

[8] “Model order reduction for bifurcating phenomena in fluid-structure interaction problems”

Authors: M. KHAMLICH, F. PICHI, G. ROZZA.

In: [arXiv](#).

2020

[7] “A successive partition method for the efficient evaluation of parametrized stability factors”

Authors: F. BALLARIN, F. PICHI, G. ROZZA.

In: Preprint

[6] “Driving bifurcating parametrized nonlinear PDEs by optimal control strategies: application to Navier-Stokes equations and model reduction”

Authors: F. PICHI, M. STRAZZULLO, F. BALLARIN, G. ROZZA.

In: [arXiv](#).

2019

[5] “Reduced order models for the buckling of hyperelastic beams.”

Authors: F. PICHI, J. EFTANG, G. ROZZA, A. T. PATERA.

In: Report MIT-FVG “ROM2S”

[4] “Efficient computation of bifurcation diagrams with a deflated approach to reduced basis spectral element method”

Authors: M. PINTORE, F. PICHI, M. HESS, G. ROZZA, C. CANUTO.

In: *Advances in Computational Mathematics*, 47:1, 2021.

[3] “A Reduced Order technique to study bifurcating phenomena: application to the Gross-Pitaevskii equation”

Authors: F. PICHI, A. QUAINI, G. ROZZA.

In: *SIAM Journal on Scientific Computing*, 42:5, B1115-B1135, 2020.

[2] [“Reduced basis approaches for parametrized bifurcation problems held by non-linear von Kármán equations”](#)

Authors: F. PICHI, G. ROZZA.

In: [Journal of Scientific Computing](#), 10.1007/s10915-019-01003-3, 2019.

2018

[1] [“Reduced Basis Approximation and A Posteriori Error Estimation: Applications to Elasticity Problems in Several Parametric Settings”](#)

Authors: D.B.P. HUYNH, F. PICHI and G. ROZZA

In: [Numerical Methods for PDEs: State of the Art Techniques](#), Springer International Publishing, Ch. 8, 203–247, 2018.

EDUCATION

2016-2020 SISSA, Trieste (Italy)

Ph.D. degree

Mathematical Analysis, Modelling and Applications · Mathematics Area
Thesis: *Reduced order models for parametric bifurcation problems in nonlinear PDEs*
Advisors: Prof. Gianluigi ROZZA & Dr. Francesco BALLARIN
Final Grading *cum laude*

2014-2016 ‘La Sapienza’ University, Rome (Italy)

Master degree

Applied Mathematics · Department of Mathematics
Thesis: *Reduced order methods for parametric Von Kármán equations*
Advisors: Prof. Maurizio FALCONE & Prof. Gianluigi ROZZA
Final Grading *110/110 cum laude*

2011-2014 ‘La Sapienza’ University, Rome (Italy)

Bachelor degree

Mathematics · Department of Mathematics
Thesis: *Discontinuous differential equations in control theory*
Advisor: Prof. Corrado MASCIA
Final Grading *110/110 cum laude*

OTHER INFORMATION

Teaching and Tasks

Lecturer - “Reduced order modelling in bifurcating parametrised non-linear equations”, SISSA, Trieste, 2019.

Matlab - Bachelor Degree in Mathematics, University of Trieste, 2019.

Co-advisor - Master thesis of Moreno Pintore, “Efficient Computation of Bifurcation Diagrams with Spectral Element Method and Reduced Order Models”. Master degree in Mathematical Engineering, Politecnico di Torino, Italy, (Oct. 2019).

Co-advisor - Master thesis of Moaad Khamlich, “Reduced order models for bifurcating phenomena in Fluid-Structure Interaction problems”. Master degree in Mathematical Engineering, Politecnico di Milano, Italy, (Apr. 2021).

President SISSA Siam Student Chapter (2019-2020)

Organizer SISSA SIAM Student Chapter Colloquia 2020, Virtual Event

Awards and Funding

2021 **Fondazione CIME** · Grant for CIME Summer School: Model Order Reduction and Applications

2021 **GNCS-INDAM** · Grant for Coupled Problems 2021

2021 **CRUI project GO for IT** · Research grant between EPFL and SISSA: “Reduced order method for nonlinear PDEs enhanced by machine learning”

2020 **ECCOMAS Scholarship** · Grant for WCCM-ECCOMAS Virtual Congress

2019 Banco Santander Financial Support Program · Grant for 9th International Congress on Industrial and Applied Mathematics ICIAM2019

2018 MIT-Italy - FVG Project · ROM2S Reduced Order Methods at MIT and SISSA

2018 INDAM GNCS · Tecniche di riduzione di modello per le applicazioni mediche

2017 INDAM GNCS · Tecniche di riduzione computazionale e applicazioni SISSA · Master thesis fellowship for pre-graduate students

Sapienza University · Excellence course for Master degree in Applied Mathematics 2014-2016

Sapienza University · Excellence course for Bachelor degree in Mathematics 2011-2014

*Conferences
and
Workshops*

MMLDT-CSET2021 (talk), CIME Summer School 2021 (talk), Coupled 2021 (talk), FEniCS 2021 (talk), SIAM CSE 2021 (talk), WCCM-ECCOMAS 2020 (talk), MORSS 2020 (talk), SAMM 2020 (poster), UMI 2019 (talk), ICIAM 2019 (talk), ROM in CFD (poster), CIME-EMS Summer School, ICOSAHOM 2018 (talk), MoRePaS 2018 (poster), QUIET 2017, FEF 2017, EU-MORNET.

October 14, 2021