

# Francesca Bonizzoni

## Scientific Curriculum

### Personal data

Date of Birth **1986.**

Nationality

Marital St.

### Education

- 20/05/2013 **Ph.D in Mathematical Models and Methods in Engineering**, *Politecnico di Milano*, Italy, (with the Doctor Europæus certification).  
Title issued by the Politecnico di Milano, Italia, registered at N. 2834.
- 02/2010 **“Diploma di Licenza” for the class of Sciences and Technologies** *Istituto per gli Studi Superiori IUSS Pavia*, Italy, Title issued by the Istituto Universitario di Studi Superiori di Pavia IUSS, Italia, on the 6th of July, 2010..
- 14/07/2009 **Master Degree in Mathematics** *University of Pavia*, Italy, Title issued by the Università degli Studi di Pavia, Italia, on the 23th of February, 2010, registered at Foglio 82 N. 3173..
- 12/09/2007 **Bachelor Degree in Mathematics** *University of Pavia*, Italy, Title issued by the Università degli Studi di Pavia, Italia, on the 3rd of April, 2008, registered at Foglio 51/1 N. 2061.

### Professional career

- since **Assistant Professor (RtdB) in Numerical Analysis** *MOX - Department of Mathematics, Politecnico di Milano*,  
01/09/2022
- 01/02/2021 - **Junior Professor (W1) for Numerical Simulation**, *Institute of Mathematics, University of Augsburg*,  
31/08/2022
- 13/01/2020 - **Principal Investigator of the project “Model Order Reduction for Time-Harmonic Wave Problems”**, *Faculty of Mathematics, University of Vienna* (13/01/2020 - 03/05/2020 part time position at 50%; 04/05/2020 - 31/01/2021 full time position).
- 24/03/2019 - **Maternity leave**.  
12/01/2020
- 29/12/2018 - **Principal Investigator of the project “Model Order Reduction for Time-Harmonic Wave Problems”**, *Faculty of Mathematics, University of Vienna*, (full time position).  
23/03/2019
- 27/05/2017 - **University assistant - Post doc** *Faculty of Mathematics, University of Vienna* (27/05/2017 - 28/12/2018: part time position at 50%; 02/10/2017 - 31/12/2017: part time position at 75%; 01/01/2018 - 28/12/2018: full time position), Announcement N. 3924. Personal Number 54319.

- 30/05/2016 - **Maternity leave.**  
26/05/2017
- 01/01/2014 - **University assistant - Post doc** Faculty of Mathematics, University of Vienna, (full time position), Announcement N. 3924. PersonalNumber 54319.
- 29/05/2016
- 2013 **Research Assistant** Laboratory of Modeling and Scientific Computing MOX - Department of Mathematics, Politecnico di Milano, Per N. 2366 Reg il 18 DIC. 2012 Prot. N. 34563..
- 07 - 12/2013 **Postdoctoral fellowship** CSQI - MATHICSE, École Polytechnique Fédérale de Lausanne.
- 10/2011 - **Doctoral fellowship**, CSQI - MATHICSE, École Polytechnique Fédérale de Lausanne.  
06/2013
- 2010 - 2012 **Ph.D student in Mathematical Models and Methods in Engineering**, Laboratory of Modeling and Scientific Computing MOX - Department of Mathematics, Politecnico di Milano, Italy.

## Prizes/Awards

- 2022 **Funding of the GNCS project CUP\_E55F2200027001 “Sviluppo di sinergie fra calcolo scientifico e machine learning per applicazioni biomediche”** (2400 e, 1 year).
- 2021 **Funding of visiting fellow - Romberg-program** Graduiertenschule HGS MathComp Universität Heidelberg.
- 2018 **Funding of my FWF Hertha Firnberg Grant T 998 “Model Order Reduction for Time-Harmonic Wave Problems”**, (234,210.00 e, 3 years).
- 2010 **Valter Esposti prize**, Dipartimento Sistemi di Produzione, CNR, Italy.
- 2004 - 2009 **Student at the “Collegio Nuovo Sandra e Enea Mattei” (Pavia)** Center of Educational Excellence and member of the Conference of the University Colleges (CCUM).

## Research Projects

- 2022 - 2023 **GNCS project (Project n. CUP\_E55F2200027001)**, Sviluppo di sinergie fra calcolo scientifico e machine learning per applicazioni biomediche, Team member.
- since 2021 **ERC Consolidator Grant (Project n. 865751)**, Computational Random Multiscale Problem, team member.
- 2018-2021 **FWF Firnberg-Programme (Project n. T 998)**, Model order reduction for time-harmonic wave problems, Principal Investigator.
- 2017-2021 **FWF Special Research Program (Project n. F65)**, Taming complexity in partial differential systems, team member.
- 2013 **FIRB-IDEAS (Project n. RBID08223Z)**, Advanced numerical techniques for uncertainty quantification in engineering and life science problems, team member - research assistant.
- 2010-2012 **FIRB-IDEAS (Project n. RBID08223Z)**, Advanced numerical techniques for uncertainty quantification in engineering and life science problems, team member - Ph.D. student.

## Invited Lectures

### Invited Talks at conferences and workshops

- 06/2022 **Talk presented with invitation in a Minisymposium at the Workshop “Hilbert Complexes: Analysis, Applications, and Discretizations”** Title: *BGG sequences of tensor product finite elements with arbitrary continuity*, Mathematisches Forschungsinstitut Oberwolfach, Germany.
- 06/2022 **Talk presented with invitation at the ESI Thematic Programme “Computational Uncertainty Quantification: Mathematical Foundations, Methodology & Data”, WS5 “WS5 “UQ in kinetic and transport equations and in high-frequency wave propagation”**, Title: *Rational-based MOR methods for parametric-in-frequency Helmholtz problems with adapted snapshots*, Erwin Schrödinger International Institute for Mathematics and Physics (ESI), Vienna, Austria.
- 01/2021 **Talk presented with invitation at the Workshop “Nonstandard Finite Element Methods”**, Title:  *$H^1$ -conforming finite element cochain complexes on Cartesian meshes*, Mathematisches Forschungsinstitut Oberwolfach, Germany.
- 04/2018 **Talk for the event “Laureato... e adesso?”**, Collegio G. DeMaino, Pavia, Italy.
- 06/2015 **Talk for the event “Vienna PDE Day”**, Title: *PDEs with stochastic data*, Technical University of Vienna, Austria.
- 11/2013 **Talk presented with invitation at the Workshop “Partial Differential Equations with Random Coefficients”** Title: *Low-rank techniques applied to moment equations for the stochastic Darcy problem with lognormal permeability* Weierstrass Institute, Berlin, Germany.
- 07/2013 **Talk presented with invitation in a Minisymposium at the Workshop “Multiscale and High-Dimensional Problems”** Title: *Low-rank techniques applied to moment equations for the stochastic Darcy problem with lognormal permeability* Mathematisches Forschungsinstitut Oberwolfach, Germany.
- Invited contributions to Minisymposia
- 08/2022 **Talk presented with invitation in the Minisymposium “Eigenvalue problems in applied mathematics” at the CMAM 2022 (Computational Methods in Applied Mathematics)** Title: *A greedy method for the tracking of eigensolutions to parametric PDEs*, Vienna, Austria.
- 06/2022 **Talk presented with invitation in the Minisymposium “Advances in structure-preserving methods and applications” at the ECCOMAS 2022** Title:  *$H^1$ -conforming finite element cochain complexes on Cartesian meshes*, Oslo, Norway.
- 04/2022 **Talk presented with invitation in the Minisymposium “IGA and Other Spline-based Methods in UQ” at the SIAM conference on Uncertainty Quantification 2022** Title: *Interplay between Isogeometric and Stochastic collocation for Uncertainty Quantification of timber beams*, Atlanta, Georgia, USA.
- 04/2018 **Talk presented with invitation in the Minisymposium “Advances in Reduced Order Modeling for Uncertainty Quantification” at the SIAM conference on Uncertainty Quantification 2018** Title: *Padé approximation for Helmholtz frequency response problems with stochastic wavenumber*, Garden Grove, California, USA.

01/2013 **Talk presented with invitation in a Minisymposium in the Session on “Finite Element Exterior Calculus” at the Congress “Joint Mathematics Meetings 2013”**<sup>Title:</sup> *Equations for the probabilistic moments of the solution of the stochastic Hodge Laplacian*, San Diego, California, USA.

### Invited research seminars

12/2021 **Seminar for the “IWR Colloquium”** , *Title: Model order reduction methods for time-harmonic wave problems*, Ruprecht-Karls-Universität Heidelberg, Interdisziplinäres Zentrum für Wissenschaftliches Rechnen (IWR), Heidelberg, Germany.

5/2021 **Seminar for the “NMPP-Seminars”**, *Title:  $H^1$ -conforming finite element cochain complexes on Cartesian meshes*, Max-Planck-Institute, Munich, Germany.

4/2021 **Seminar for the series of seminars “PDE afternoon” - Special Research Program F65 “Taming Complexity in Partial Differential Systems”**<sup>Title:</sup> *Rational-based MOR for parametric Helmholtz-constrained optimization problems*, University of Vienna, Austria.

01/2021 **Seminar at the “CASA Colloquium”**, *Title: Rational-based MOR for parametric Helmholtz problems*, Eindhoven University of Technology, Netherlands.

10/2017 **Seminar for the series of seminars “PDE afternoon” - Special Research Program F65 “Taming Complexity in Partial Differential Systems”**<sup>Title:</sup> *Padé approximation for Helmholtz frequency response problems*, Technical University of Vienna, Austria.

### Lecturer for Summer/Winter Schools

09/2020 **Talk for the EPFL Model Order Reduction Summer School 2020**, *Title: Rational-based MOR for parametric Helmholtz problems*, (virtual).

09/2014 **Invited lecturer for a short course for DK (Doctoral Program Dissipation and Dispersion in Nonlinear PDEs - University of Vienna - Technical University of Vienna - Institute of Science and Technology Austria) Summer School**<sup>Title:</sup> *Stochastic PDEs*, Weisensee, Austria.

### Memberships in Academic Organisations

2017-2018 **Member of Habilitation Committee**, *Faculty of Mathematics*, University of Vienna.

### Organization activity

09/2021 **Organizer of workshop** *Title: “Scattering by random heterogeneous media”* , Augsburg, Germany.  
Co-organizer: D. Peterseim

09/2022 **Organizer of minisymposium** *Title: “Computational stochastic PDEs”*, Conference: Computational Methods in Applied Mathematics (CMAM) 2022, Vienna, Austria.  
Co-organizer: M. Ruggeri

04/2022 **Organizer of minisymposium** *Title: “Reduced Order Modelling for Forward and Inverse UQ”*, Conference: SIAM Conference on Uncertainty Quantification (SIAM UQ) 2022, Atlanta, Georgia, USA.  
Co-organizer: F. Ballarin

- 08-09/2021 **Organizer of minisymposium** *Title: "Trending topics in Uncertainty Quantification"* , Conference: Congress of the Italian Society of Industrial and Applied Mathematics (SIMAI), Parma, Italy.  
Co-organizers: A. Manzoni, L. Tamellini
- 07/2021 **Organizer of minisymposium** *Title: "Adaptive and high-order approximation based on Reduced Order Methods"*; Conference: International Conference on Spectral and High Order Methods (ICOSAHOM), Vienna, Austria.  
Co-organizer: G. Rozza
- 09/2019 **Organizer of minisymposium** *Title: "Reduced Order Models for parametric PDEs: special focus on time-dependent phenomena and time-harmonic wave problems"*; Conference: European Numerical Mathematics and Advanced Applications conference (ENUMATH), Egmond aan Zee, The Netherlands.  
Co-organizer: G. Rozza

## Teaching activity

**Reviewer of Master Thesis**, *"Solving Hyperbolic Partial Differential Equations with a Transformed Snapshot-Driven Dynamic Mode Decomposition Method"*, Erdem Kadir Can, Institute of Mathematics, University of Augsburg.

**Co-advisor of Master Thesis**, *"Padé approximations for the Helmholtz equation"* , Konstantin Jung, Faculty of Physics, University of Vienna.

**Lecturer of 4 Master courses.**

**Exercise classes for 3 Master courses.**

**Exercise classes for 13 Bachelor courses.**

## Editor activity

since 2022 **Frontiers in Applied Mathematics and Statistics.**

since 2022 **Journal of Computational and Applied Mathematics.**

## Review activity

since 2022 **Multiscale Modeling and Simulation.**

since 2022 **SIAM Journal on Scientific Computing.**

since 2021 **Advances in Computational Mathematics.**

since 2021 **Discrete Dynamics in Nature and Society.**

since 2021 **Journal of Computational and Applied Mathematics.**

since 2021 **Computers and Mathematics with applications.**

since 2021 **International Journal for Numerical Methods in Engineering.**

since 2020 **MathSciNet.**

since 2020 **Applied Numerical Mathematics.**

since 2019 **International Journal of Computational Fluid Dynamics .**

since 2018 **ESAIM: Mathematical Modelling and Numerical Analysis (ESAIM: M2AN).**

since 2018 **Mathematics of Computation (MCOM) - American Mathematical Society.**

## Invited research visits

- 2022 **Visiting Romberg professor** *Ruprecht-Karls-Universität Heidelberg, Interdisziplinäres Zentrum für Wissenschaftliches Rechnen (IWR), Germany, Invited by Prof. G. Kanschat.*
- 2013 **Visiting research assistant - Post doc** *Ecole Polytechnique Fédérale de Lausanne Switzerland, Invited by Prof. F. Nobile.*
- 2011 - 2013 **Visiting Ph.D student** *Ecole Polytechnique Fédérale de Lausanne Switzerland, Invited by Prof. F. Nobile.*
- 2012 **Visiting Ph.D student** *KAUST - King Abdullah University of Science and Technology, Kingdom of Saudi Arabia (two weeks), Invited by Prof. R. Tempone.*
- 2010 **Visiting Ph.D student** *University of Minnesota, USA (one month), Invited by Prof. D. N. Arnold.*

## Bibliometrics

**10 papers published in peer-reviewed journals.**

**3 proceedings in international congresses.**

**5 preprints submitted to peer-reviewed journals.**

**4 thesis.**

## Language skills

Italian **mother language.**

English **oral: very good, written: very good.**

French **oral: good, written: good.**

German **oral: intermediate, written: intermediate, (certification B1.2).**

Il sottoscritto, consapevole che - ai sensi dell'art. 76 del D.P.R. 445/2000 - le dichiarazioni mendaci, la falsità negli atti e l'uso di atti falsi sono puniti ai sensi del codice penale e delle leggi speciali, dichiara che le informazioni rispondono a verità. Il sottoscritto dichiara di aver ricevuto l'informativa sul trattamento dei dati personali.