

# CURRICULUM VITAE ET STUDIORUM

## CURRENT POSITION

**2021-** Clinical Professor of Mathematics at New York University, Abu Dhabi

## EDUCATION

**1980** Abitur, German School, Milan, Italy

**1984** M.S. at Universita' degli Studi di Milano, Milan, Italy Major: Mathematics.

## PERSONAL SKILLS

Mother tongue: Italian

Other languages: fluent in English, French and German.

## PAST EMPLOYMENT

**2013-2021** Associate Professor Politecnico of Milan

**1998-2012** Associate Professor Universita' "La Sapienza", Rome

**1996-98** Researcher of the Consiglio Nazionale delle Ricerche (CNR) at the "Istituto di Analisi Globale e Applicazioni", Florence

**1992-95** Researcher at the "Istituto per le Applicazioni del Calcolo of the Consiglio Nazionale delle Ricerche (CNR), Rome

**1985-92** Researcher of the Consiglio Nazionale delle Ricerche (CNR) at the "Istituto di Analisi Globale e Applicazioni" , Florence

## EDITORIAL

**2020-present** Editor, Inverse Problems

**2021-** Associate Editor, Multiscale Modeling and Simulation: a SIAM interdisciplinary journal (MMS)

## GRANTS AND AWARDS

**2021** Reviewer of ERC Starting Grants 2021

**2020** Member of the Committee for the PhD Prize of the "Gesellschaft fuer Inverse Probleme" in Germany

**2017** Member of the Evaluation Panel of INRIA

**2017** ICERM Research Fellow in the program Mathematical and Computational Challenges in Radar and Seismic Reconstruction, Brown University, November 2017

**2016** IOP Publishing Reviewer Award

**2015** Member of the Review Panel for the Academy of Finland and the Research Council for Natural Sciences and Engineering.

**2013** National Habilitation to Professorship

**2010** Research Membership "Inverse Problems and Applications", MSRI, Berkeley

### **RECENT VISITING POSITIONS**

**2018** Visiting Professor at NYU-AD, August 2018-August 2021

**2018** Visitor at ETH Zurich (February 2018)

**2017** Research Fellow at ICERM Semester Program on "Mathematical and Computational Challenges in Radar and Seismic Reconstruction" (September 6 - December 8, 2017)  
Brown University

**2017** Visitor at Penn State University

**2016** Visiting Associate Professor at NYU-AD, August 2016-August 2017

**2016** Visitor at University of Wien June and July 2016

**2015** Visiting Professor at NYU-AD, August-February 2016

**2015** Visitor of MIT, Boston, April 2015

**2013** Participant of the Program "Inverse Problems and Applications", Mittag-Leffler Institut, Sweden

**2012** Visitor of Ecole Normale Supérieure, June 2012, Paris

**2012** Visitor of Erwin Schrödinger Institut, April 2012, Wien

**2012** Visitor of Cornell University, March 2012, USA

**2010** Research Member at the Mathematical Sciences Research Institute (MSRI), Berkeley, September, November 2010

### **RECENT INVITED TALKS**

**2021** SIMAI conference, Parma 30 Aug-3 Sept 2021, invited to minisymposium New trends in tomography: From microscopy to astronomy.

**2021** Inverse Problems on Large Scales, Dec 6-10, 2021 RICAM, Linz (invited speaker)

**2021** Tomographic Reconstructions and their Startling Applications, Erwin Schrödinger International Institute for Mathematics and Physics, Vienna, March 15-26 2021 (invited speaker)

**2021** Statistical aspects of non-linear inverse problems, BIRS, Banff 2021 (invited speaker)

**2021** Women in Inverse Problems, BIRS, Banff 2021 (Invited Speaker)

- 2020** Computational Inverse Problems for Partial Differential Equations, Oberwolfach December 2020 (Invited speaker)
- 2020** Inverse Problems: Modeling and Simulation, Malta, May 24-30 2020 (Invited speaker)
- 2019** Nonlinear Diffusion Problems, Rome, September 11-13, 2019 (Invited speaker)
- 2019** Mathematical modelling and analysis for advanced structural design, simulation and optimization, Pavia, Italy, 11-13 September 2019 (Invited speaker)
- 2019** Workshop "Women in Analysis" June 2019 at the Banff International Research Station (BIRS) Canada (partecipant )
- 2019** "Applied Inverse Problems" Grenoble, July 8-12 2019 (Plenary speaker)
- 2019** "Recent advances in Phase-Field modeling: from Engineering to Biology" Pavia, May 8-10, 2019 (Invited speaker).
- 2019** Mathematical and numerical approaches for multi-wave inverse problems, 1-5 April 2019, Marseille, France (Plenary speaker)
- 2018** Inverse Problems in the Alps II, 18-23 March 2018, Obergurgl, Austria
- 2018** Special Materials and Complex Systems – SMACS 2018, Gargnano, Italy, June 18-22, 2018
- 2017** Workshop "Recent Advances in Seismic Modeling and Inversion: From Analysis to Applications", November 2017 ICERM, Brown University

### **RECENT ACTIVITIES**

- 2020** Organizer of "Women and Mathematics", NYU Abu Dhabi February 11-12
- 2020** Member of Evaluation Committee for a Tenure Track Position at the University of Wien
- 2019** Member of Evaluation Committee for Professorship Position at the University of Chile
- 2019** Organizer with O. Scherzer, U. Ascher and L. Vese of a Workshop "Reconstruction Methods for Inverse Problems" to be held in 2019 at the Banff International Research Station (BIRS) Canada
- 2018** Organizer of a 5 Day Workshop on "Reconstruction Methods for Inverse Problems" at Indam Rome (28 May-1June 2018)
- 2017** Member of the Committee of the PhD thesis of Florian Faucher at INRIA, France
- 2017** Member of Scientific Committee of the Conference "Picof 2018"
- 2016** Member of Scientific Committee of the Conference "Picof 2016" Grenoble, France
- 2016** Organizer of the minisymposium "Tomographic Reconstruction of Discontinuous Co-

efficients” at the Conference ”Radon 100” in Linz, March 2017.

**2015** Coorganizer of a mini symposium of the conference ”Applied Inverse Problems”, may 2015, Helsinki.

**2014** Coorganizer of a mini symposium of the conference ”Inverse Problems from Theory to Applications”, August 2014, Bristol.

**2013** Coorganizer of a Conference in honor of Michael Vogelius, CIRM, Luminy, May 2013

### **STUDENTS**

Luca Ratti, PhD student (February 2019, Politecnico di Milano) currently Post-Doc at Center of Excellence in Inverse Problems (University of Helsinki)

Andrea Aspri, PhD student (January 2017, University La Sapienza, Rome) currently Post-Doc at Radom Institute of Applied Mathematics (Austria)

Matteo Santacesaria Post-Doc (11/2015-11/2017, Polimi International Fellowship).

Several Master Degree students

### **REFEREE WORK**

Referee for SIAM J. Math Anal., SIAM J. in Imaging Science, Annali della Scuola Normale Superiore di Pisa, SIAM J. Control Opt., SIAM J. Appl. Math., Comm. PDE, Proc. Amer. Math. Soc. , Inverse Problems. Inverse and Ill Posed Problems, Trans. Amer. Math. Soc., Inverse Problems and Imaging, Journal of European Mathematical Society.

### **RECENT SELECTED PUBLICATIONS**

- [1] E. Beretta, M. V. de Hoop, F. Faucher and O. Scherzer ”Inverse boundary value problem for the Helmholtz equation: quantitative conditional Lipschitz stability estimates ” (2016) SIAM J. Math. Anal. vol 48 3962-3983
- [2] E. Beretta, M. V. de Hoop, E. Francini , S. Vessella ” Lipschitz determination of interfaces in the Helmholtz equation from boundary data.” Comm. PDE 40, (2015) no 7 13651392
- [3] E. Beretta, M. V. de Hoop, E. Francini, S. Vessella, J Zhai ” Conditional Lipschitz stability of an inverse boundary value problem for the time harmonic elastic waves.” Vol 33 Number 3, (2017) Inverse Problems
- [4] E. Beretta, M.C. Cerutti, A. Manzoni, D. Pierotti ”On a semilinear elliptic boundary value problem arising in cardiac electrophysiology.” M3AS, 26 (2016) no 4, 645-670
- [5] E. Beretta, E. Francini and S. Vessella ”Differentiability of the Dirichlet to Neumann map under movements of vertices of triangular inclusions” SIAM J. Math Anal. 49 No. 2756776 (2017)

- [6] E. Beretta, C. Cavaterra, J. Ortega and S. Zamorano "Size estimates of an obstacle in a stationary Stokes fluid" Vol 33 No 2, (2017) Inverse Problems
- [7] E. Beretta, C. Cavaterra, C. Cerutti, A. Manzoni, L. Ratti "On the inverse problem of locating small dimensions ischemias for the monodomain equation of cardiac electrophysiology: theoretical analysis and numerical reconstruction, Inverse Problems 33 (2017) 32pp
- [8] E. Beretta, S. Micheletti, S. Perotto, M. Santacesaria, "Reconstruction of a piecewise constant conductivity on a polygonal partition via shape optimization in EIT" Journal of Comp. Phys. 353 (2018) 264-280
- [9] E. Beretta, L. Ratti, M. Verani "A phase field approach for the interface reconstruction in a nonlinear elliptic problem arising from cardiac electrophysiology" Comm. Math. Sci.(2018) 16 no. 7
- [10] A. Aspri, E. Beretta, E. Rosset "On an elastic model arising from volcanology: an analysis of the direct and inverse problem" J. Differential Equations 265 (2018), no. 12, 64006423.
- [11] A. Aspri, E. Beretta, A. Mazzucato, M. de Hoop "Analysis of a model of elastic dislocations in geophysics" Archive for Rational Mechanics and Analysis 236 (1), 71-111, (2020)
- [12] E. Beretta, E. Francini "Lipschitz stability estimates for polygonal conductivity inclusions from boundary measurements" Applicable Analysis, Special Issue, (2020)
- [13] E. Beretta, C. Cavaterra, L. Ratti "On the determination of small ischemic regions in the monodomain model of cardiac electrophysiology" Nonlinearity 33 (2020) 5659-5685
- [14] A. Aspri, E. Beretta, O.Scherzer, M. Muszkietka "Asymptotic expansions for higher order elliptic equations and an application in Quantitative Photoacoustic Tomography" SIAM J. Imaging Science (13) (Oct 22 2020)
- [15] A. Aspri, E. Beretta, A. Mazzucato, "Dislocations in a layered elastic medium with applications to fault detection" (2020) to appear on JEMS
- [16] A. Aspri, E. Beretta, A. Gandolfi, E. Wasmer " Mortality containment vs. economics opening: optimal policies in a SEIARD model" , Mar 2021, Journal of Mathematical Economics. 93, 102490
- [17] E. Beretta, M. C. Cerutti, L. Ratti "Lipschitz stable determination of small conductivity inclusions in a semilinear equation from boundary data", Mathematics In Engineering. 3, 1-10
- [18] E. Beretta, E. Francini, S. Vessella "Lipschitz stable determination of polygonal conductivity inclusions in a layered medium from the Dirichlet to Neumann map ",to appear SIAM J. Math. Anal. (2020)

- [19] A Gandolfi, A Aspri, E Beretta, K Jamshad, M Jiang "A new threshold reveals the uncertainty about the effect of school opening on diffusion of Covid-19" (2021) submitted
- [20] E. Beretta, M. C. Cerutti, D.Pierotti, "Detection of cavities in a nonlinear model arising from cardiac electrophysiology via  $\Gamma$ -convergence", (2021) submitted