# CURRICULUM VITAE

FORMATO EUROPEO /EUROPEAN FORMAT

## INFORMAZIONI PERSONALI/ PERSONAL INFORMATION

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|---|---|
| Nome, Cognome/Name, Surname | Elisabetta, Rocca |
| Indirizzo/Address | |
| Via, numero civico, c.a.p., città, nazione/ House number, street name, postcode, city, country | |
| Telefono/Telephone | |
| Fax | |
| E-mail | |
| Sito web/Website | |
| Nazionalità/Nationality | |

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|---|---|
| Name and address of employer | Universita' degli Studi di Pavia, Strada Nuova 65, 27100 Pavia, ITALY |

## ESPERIENZA PROFESSIONALE /WORK EXPERIENCE

**Current positions:** Full Professor of Mathematical Analysis at the Mathematical Department of the University of Pavia, since November 1st, 2018. Research Associate at the Istituto di Matematica Applicata e Tecnologie Informatiche "Enrico Magenes", Consiglio Nazionale delle Ricerche, Pavia.

**Previous positions:** 1) Associate Professor of Mathematical Analysis at the Mathematical Department of the University of Pavia, from March 1st, 2016 till October 31, 2018. 2) Head of the research Group . Entropy Formulation of Evolutionary Phase Transitions at the Weierstrass Institute for Applied Analysis and Stochastics, in Berlin, from October 2013 to February 29, 2016. 3) Associate Professor of Mathematical Analysis at the Mathematical Department of the University of Milano, from November 1st, 2010 to February 29, 2016. 4) Researcher of Mathematical Analysis at the Mathematical Department of the University of Milano, from January 2004 to October 2010. 5) Post-Doc at the Mathematical Department of the University of Pavia, from June to December 2003.

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| Type of business or sector | Education and Research |
| Occupation or position held | Full professor in a public University, Research Associate at the IMATI-CNR |
| Main activities | Teaching, research activity, direction and other administrative duties. |

**Educational Background.**
**Doctor Degree.** Elisabetta Rocca got the Doctor Degree in Mathematics (PhD) on Februaru, 19, 2004 at the Università degli Studi di Pavia
**University.** Studies in Mathematics at Università degli Studi di Pavia, Strada Nuova 65, 27100 Pavia, Italy, with graduation 110/100 cum laude on July, 1st, 1999.
**High schools** at Liceo Scientifico "C. Golgi", Broni (PV), Italy, ended in June 1995 with graduation 60/60.
**Secondary schools** at Scuola Media Statale, Santa Maria della Versa (PV), Italy, ended in June 1990.
**Primary schools** at Scuole Elementari of Santa Maria della Versa (PV), Italy, ended in June 1987.

Principal subjects  occupational
skills covered

Mathematics, in particular Applied Mathematical Analysis

Title of qualification awarded

PhD in Mathematics

Level in National classification

Doctoral level

## RESEARCH ACTIVITIES

Research sectors

**Main areas:** Analysis of Partial Differential Equations, Continuum Thermomechanics,Fluid mechanics, Nonlinear partial differential equations, in particular:
- Phase-field systems applied to Engineering and Biology
- Well-posedness of problems arising from phase transition-separation phenomena
- Existence of solutions for coupled Navier-Stokes systems
- Nonlocal effects in phase transitions phoenomena
- Long time behaviour and study of the attractors for nonlinear/singular phase-field systems
- Inverse problems: identification of memory kernels in PDE systems

Recent Scientific Activities.

Concerning the research activity, the recent research subjects regard the study of phase field models arising in engineering (AM) and biological (tumor growth) problems. Models for the evolution of liquid crystals or two phase fluids. The main analytical interests consist in proving existence of weak solutions, uniqueness and possible regularity as well as long-time behavior of solutions for the corresponding nonlinear PDE system.

**Recent scientific articles**

Co-author of 89 papers (6 as single author):
80 paper published (since 2000 up to now) in international peer-reviewed journals, 1 paper to appear in international peer-reviewed journals and international volumes, 1 preprint, 7 papers published in peer-reviewed conference proceedings or international volumes. Co-editor of 8 international volumes published on international journals.

**Selection of Recent published papers and preprints**

Massimo Carraturo, Elisabetta Rocca, Elena Bonetti, Dietmar Hömberg, Alessandro Reali, Ferdinando Auricchio, Additive Manufacturing Graded-material Design based on Phase-field and Topology Optimization, arXiv:1811.07205v2 (2018).

S. Frigeri, K.-F. Lam, E. Rocca, G. Schimperna,
On a multi-species Cahn-Hilliard-Darcy tumor growth model with singular potentials,
Comm Math Sci., 16 (2018), 821--856.

E. Feireisl, E. Rocca, G. Schimperna, A. Zarnescu,
On a hyperbolic system arising in liquid crystals modeling,
Journal of Hyperbolic Differential Equations, 15 (2018), 15--35.

M. Frémond, M. Marino, E. Rocca,
Collisions in shape memory alloys,
GAMM-Mitt. 40, No. 3, 157-177 (2017) / DOI 10.1002/gamm.201730002 .

S. Melchionna, E. Rocca,
Varifold solutions of a sharp interface limit of a diffuse interface model for tumor growth,
Interfaces and Free Boundaries, 19 (2018), 571--590.

P. Krejci, E. Rocca, J. Sprekels,
Unsaturated deformable porous media flow with phase transition,
Math. Models Methods Appl. Sci., 27 (2017), 2675--2710.

E. Bonetti, E. Rocca, R. Scala, G. Schimperna,
On the strongly damped wave equation with constraint,
Commun. Part. Diff. Eq., 42 (2017), 1042--1064.

V. Barbu, P. Colli, G. Gilardi, G. Marinoschi, E. Rocca,
Sliding mode control for a nonlinear phase-field system,
SIAM J. Control Optim. 55 (2017), 2108--2133.

E. Bonetti, E. Rocca,
Unified gradient flow structure of phase field systems via a generalized principle of virtual powers,
ESAIM : COCV, 23 (2017), 1201--1216.

E. Rocca, R. Scala,
A rigorous sharp interface limit of a diffuse interface model related to tumor growth,
J. Nonlinear Sci., 27 (2017), 847--872.

C. Heinemann, C. Kraus, E. Rocca, R. Rossi,
A temperature-dependent phase-field model for phase separation and damage,
Arch. Ration. Mech. Anal., 225 (2017), 177--247.

C. Cavaterra, E. Rocca, H. Wu,
Optimal boundary control of a simplified Ericksen–Leslie system for nematic liquid crystal flows in 2D,
Arch. Ration. Mech. Anal., 224 (2017), 1037--1086.

B. Detmann, P. Krejci, E. Rocca,
Solvability of an unsaturated porous media flow problem with thermomechanical interaction,
SIAM J. Math. Anal., 48 (2016), 4175--4201.

M. Eleuteri, E. Rocca, G. Schimperna,
Existence of solutions to a two-dimensional model for nonisothermal two-phase flows of incompressible fluids,
Ann. Inst. H. Poincare Anal. Non Lineaire, 33 (2016), 1431-1454.

S. Frigeri, E. Rocca, J. Sprekels, Optimal distributed control of a nonlocal Cahn-Hilliard/Navier-Stokes system in 2D, SIAM J. Control Optim. 54 (2016), 221-250.

Rocca, Elisabetta

Analele Stiintifice ale Universitatii Ovidius Constanta. Seria Matematica, to appear (2017).

**Editor of the volumes:**

[V2] ``Special issue dedicated to Michel Fre'mond on the occasion of his 70th birthday'', Discrete Contin. Dyn. Syst. Ser. S, 6, No. 2 (2013), edited by E. Bonetti, C. Cavaterra, E. Rocca, R. Rossi.

[V1] ``New trends in direct, inverse, and control problems for evolution equations'', Discrete Contin. Dyn. Syst. Ser. S, 4, No. 3 (2011), edited by P. Cannarsa, C. Cavaterra, A. Favini, A. Lorenzi, E. Rocca.

[V3] ``Special issue on rate-independent evolutions and hysteresis modelling'', Discrete Contin. Dyn. Syst. Ser. S, 8, No. 4 (2015), edited by S. Bosia, M. Eleuteri, E. Rocca, and E. Valdinoci.

[V4] ``Special issue dedicated to Jürgen Sprekels on the occasion of his 65th birthday'', Discrete Contin. Dyn. Syst., 35, No. 6 (2015), edited by P. Colli, G. Gilardi, D. Hoemberg, P. Krejci and Elisabetta Rocca.

[V5] ``PDE 2015: Theory and applications of partial differential equations'', edited by Hans-Christoph Kaiser, Dorothee Knees, Alexander Mielke, Joachim Rehberg, Elisabetta Rocca, Marita Thomas and Enrico Valdinoci, Discrete Contin. Dyn. Syst. Ser. S, 10, No. 4 (2017)

**PROJECTS COORDINATION/OTHER SCIENTIFIC ACTIVITIES**

Elisabetta Rocca presently coordinates the scientific part of the Cariplo-Regione Lombdardia Project MEGAsTAR ``Matematica d'Eccellenza in biologia ed ingegneria come acceleratore di una nuova strateGia per l'ATtRattività dell'ateneo pavese''.
Elisabetta Rocca has been the Principal Investigator (April 2011-March 2017) the ERC Starting Grant Project EntroPhase,
Junior ISIMM Price 2014, from the International Society for the Interaction of Mechanics and Mathematics (ISIMM) on November 12, 2013.
She spent periods going from 1 week to 1 month in Paris, at the ``Laboratoire Central des Ponts et Chaussées'' , in Berlin, at the ``Wierstrass Institute for Applied Mathematics and Stochastics'' – WIAS, at the Necas Center for Mathematical Modelling (in Prague, Czech Republic,at the University of Bath, UK, at the "Fudan University", Shanghai, China.
Invited speaker at the 7th European Congress of Mathematics, July 18 - 22, 2016.
She attended and contributed to a number of congresses and workshops.
She organized International Workshops and International Shools.

**TEACHING ACTIVITIES**

**Undergraduate teaching**

2018-2019: Responsible of the course: Analisi Matematica A, CdL in Ingegneria Civile ed Ambientale ed Edile Architettura, University of Pavia (Analysis course for Engineering).
2017-2018: Responsible of the course: Analisi Matematica A, CdL in Ingegneria Civile ed Ambientale, University of Pavia (Analysis course for Engineering).
2016-2017: Responsible of the course: Mathematica con Elementi di Statistica, CdL in Farmacia, University of Pavia(Calculus Course with Elements of Statistics for CdL in Pharmacy).
2015-2016: Responsible of the course: Analisi Matematica 2, CdL Ingegneria,University of Milan (Analysis course for Engineering).

2011-2013: Responsible of the course: Analisi Matematica 1, CdL Matematica,University of Milan (Analysis course for Mathematics).
2008-2011: Responsible of the course: Analisi Matematica 2, CdL Fisica, University of Milan (Analysis course for Physics).
2003-2008: Responsible of the course: Istituzioni di Matematiche, CdL Comunicazione Digitale,University of Milan (Calculus for Information Sciences).
2007--2008: Assistent of the course: Istituzioni di Matematica, CdL Informatica per Telecomunicazioni, University of Milan (Calculus for Information Sciences).
2005--2007: Assistent of the course: Analisi Matematica IV, CdL Matematica, University of Milan (Analysis course for Mathematics).
2003--2004: Assistent of the course: Istituzioni di Matematiche, CdL Informatica,University of Milan (Calculus for Information Sciences).
 For the years going from 2000 to 2003: Collaborations to some calculus and advanced calculus courses at the University of Pavia.

**Graduate teaching**

2018-2019: Responsible of the course: Advanced Mathematical Methods for Engineering, Advanced Course in English for the CdL in Electronic Engineering, University of Pavia.
2017-2018: Responsible of the course: Advanced Mathematical Methods for Engineering, Advanced Course in English for the CdL in Electronic Engineering, University of Pavia.
2016-2017: Responsible of the course: Advanced Mathematical Methods for Engineering, Advanced Course for the CdL in Electronical Engineering, University of Pavia.
2015-2016: Responsible of the course: Equazioni di Evoluzione (Evolution Equations), CdL in Matematica, University of Pavia (Advanced Analysis course for students in Mathematics).
2010-2012: Responsible of the course: Equazioni di Evoluzione (Evolution Equations), PhD in Mathematics,CdL in Matematica, University of Milan (Advanced Analysis course for PhD students and Mathematics).
2008-2010: Responsible of the course: Equazioni alle derivate parziali II (PDE II), PhD in Mathematics,CdL in Matematica, University of Milan (Advanced Analysis course for PhD students and Mathematics)

**TRATTAMENTO DEI DATI PERSONALI, INFORMATIVA E CONSENSO**

Il D.Lgs. 30/6/2003, n. 196 "*Codice in materia di protezione dei dati personali*" regola il trattamento dei dati personali, con particolare riferimento alla riservatezza, all'identità personale e al diritto di protezione dei dati personali; l'interessato deve essere previamente informato del trattamento .
La norma in considerazione intende come "trattamento" qualunque operazione o complesso di operazioni concernenti la raccolta, la registrazione, l'organizzazione, la conservazione, la consultazione, l'elaborazione, la modifica, la selezione, l'estrazione, il raffronto, l'utilizzo, l'interconnessione, il blocco, la comunicazione, la diffusione, la cancellazione e la distruzione di dati, anche se non registrati in una banca dati.
In relazione a quanto riportato, autorizzo il CNR al trattamento dei dati contenuti nel presente *curriculum vitae* e nella documentazione della quale fa parte integrante

( *barrare la casella*)      X  Si, acconsento


Pavia, 29.05.2020

Firmato

Prof.ssa Elisabetta Rocca