

CURRICULUM VITAE

EUROPEAN FORMAT

INFORMAZIONI PERSONALI/ PERSONAL INFORMATION

Nome, Cognome/Name, Surname	Pierluigi, Colli
Indirizzo/Address Via, numero civico, c.a.p., città, nazione/ House number, street name, postcode, city, country	Dipartimento di Matematica "F. Casorati" Università di Pavia, Via Ferrata 1 27100 Pavia, ITALY
Telefono/Telephone	+ 39 0382 98 5617
Fax	+ 39 0382 98 5602
E-mail	pierluigi.colli@unipv.it
Sito web/Website	https://mate.unipv.it/pier/
Nazionalità/Nationality	Italian
Luogo e data di nascita/ Place and Date of birth	Vigevano (Italy), September 15, 1958

ESPERIENZA PROFESSIONALE /WORK EXPERIENCE

Se dipendente CNR indicare:	N. MATRICOLA QUALIFICA LIVELLO
In ordine di data /Dates (from – to)	Current position: full professor of Mathematical Analysis at the University of Pavia, since November 1, 1997. Research Associate at the Istituto di Matematica Applicata e Tecnologie Informatiche "Enrico Magenes", Consiglio Nazionale delle Ricerche, Pavia since since March 1, 2012 (before this date, Collaborator in the Reaserch Activities of the IMATI).
[Iniziare con le più recenti ed elencare separatamente ciascun incarico ricoperto/ Add separate entries for each relevant post occupied, starting with the most recent.]	Previous positions: <ol style="list-style-type: none">1) researcher of Mathematical Analysis at the Faculty of Engineering of the University of Pavia, from June 1983 to October 1992;2) associate professor of Mathematical Analysis at the Faculty of Engineering of the University of Pavia, from November 1992 to October 1994;3) full professor of Mathematical Analysis at the Faculty of Sciences of the University of Torino, from November 1994 to October 1997.
Nome e indirizzo del datore di lavoro / Name and address of employer	Università degli Studi di Pavia, Strada Nuova 65, 27100 Pavia, ITALY

Tipo o settore di attività / Type of business or sector
Funzione o posto occupato / Occupation or position held
Principali mansioni e responsabilità / Main activities and responsibilities

Education and Research

Full professor in a public university

Teaching, research activity, direction and other administrative duties

ISTRUZIONE E FORMAZIONE / EDUCATION AND TRAINING

In ordine di data /Dates (from – to)

[Iniziare con le più recenti ed elencare separatamente ciascun corso frequentato con successo/ Add separate entries for each relevant course you have completed, starting with the most recent.]

Nome e tipo d'istituto di istruzione o formazione / Name and type of organisation providing education and training

Principali materie e competenze professionali apprese / Principal subjects occupational skills covered
Certificato o diploma ottenuto /Title of qualification awarded

Livello nella classificazione nazionale o internazionale / Level in National classification

Educational Background.

Doctor Degree. I have no official Doctor Degree in Mathematics in the sense of a PhD. The reason is that at that time in Italy there was not the possibility of performing doctoral studies, which started later, and obviously a Doctor title was not necessary to begin an academic career.

University. Studies in Mathematics at the `Università degli Studi di Pavia, Strada Nuova 65, 27100 Pavia, Italy', with graduation on October 19, 1981.
See above

Mathematics, in particular Mathematical Analysis

Master degree in Mathematics

Master level

ATTIVITA' DI RICERCA / RESEARCH ACTIVITIES

Attuali campi di ricerca / Research sectors

Nonlinear Partial Differential Equations; Parabolic equations and evolution problems; Phase transition systems; Well-posedness, regularity, asymptotics, optimal control; Variational approach.

Concerning the research activity, some recent research subjects regard the

- well-posedness, regularity and control problems for systems modelling tumor growth;
- well-posedness, regularity, longtime behavior and optimal control for fractional Cahn-Hilliard systems;
- time discretization of a nonlinear phase field system in general domains;
- Cahn-Hilliard systems for phase separation with dynamic boundary conditions;
- a boundary control problem and the optimality conditions for the Cahn-Hilliard equation with dynamic boundary conditions;
- the well-posedness and some regularity results for a fractional tumor growth model;
- the optimal control of a phase field system modelling tumor growth with chemotaxis and singular potentials;
- the study of a phase-field model of prostate cancer growth with chemotherapy and antiangiogenic therapy effects;
- the well-posedness for a diffusion-reaction compartmental model simulating the spread of COVID-19;
- Cahn-Hilliard models coupled to viscoelasticity with large deformations.

Edited Volumes (recent)

P. Colli, A. Favini, E. Rocca, G. Schimperna & J. Sprekels (ed.), *Solvability, Regularity, Optimal Control of Boundary Value Problems for PDEs*, Springer INdAM Series 22, Springer, Cham, 2017.

P. Colli, M. Conti, A. Miranville, V. Pata & E. Rocca, Preface. Issue on Mathematics, Models & Applications: Dedicated to Professor Maurizio Grasselli, on the Occasion of His 60th Birthday, *Discrete Contin. Dyn. Syst. Ser. S* 15 (2022), no. 8, i-iii.

Recent Papers (2018-2023)

P. Colli, G. Gilardi, G. Marinoschi & E. Rocca, Distributed optimal control problems for phase field systems with singular potential, *An. Stiint. Univ. "Ovidius" Constanta Ser. Mat.* 26 (2018), 71-85.

P. Colli, G. Gilardi & J. Sprekels, On a Cahn–Hilliard system with convection and dynamic boundary conditions, *Ann. Mat. Pura Appl.* (4) 197 (2018), 1445-1475.

P. Colli, G. Gilardi, G. Marinoschi & E. Rocca, Sliding mode control for a phase field system related to tumor growth, *Appl. Math. Optim.* 79 (2019), 647-670.

P. Colli & M. Colturato, Global existence for a singular phase field system related to a sliding mode control problem, *Nonlinear Anal. Real World Appl.* 41 (2018), 128-151.

P. Colli, G. Gilardi, G. Marinoschi & E. Rocca, Optimal control for a conserved phase field system with a possibly singular potential, *Evol. Equ. Control Theory* 7 (2018), 95-116.

P. Colli, G. Gilardi & J. Sprekels, Optimal velocity control of a viscous Cahn–Hilliard system with convection and dynamic boundary conditions, *SIAM J. Control Optim.* 56 (2018), 1665-1691.

P. Colli, G. Gilardi & J. Sprekels, Optimal velocity control of a convective Cahn–Hilliard system with double obstacles and dynamic boundary conditions: a ‘deep quench’ approach, *J. Convex Anal.* 26 (2019), 485-514.

E. Bonetti, P. Colli, L. Scarpa & G. Tomassetti, A doubly nonlinear Cahn–Hilliard system with nonlinear viscosity, *Comm. Pure Appl. Anal.* 17 (2018), 1001-1022.

P. Colli, G. Gilardi & J. Sprekels, On the longtime behavior of a viscous Cahn–Hilliard system with convection and dynamic boundary conditions, *J. Elliptic Parabol. Equ.* 4 (2018), 327-347.

P. Colli & T. Fukao, Cahn–Hilliard equation on the boundary with bulk condition of Allen–Cahn type, *Adv. Nonlinear Anal.* 9 (2020), 16-38.

P. Colli, T. Fukao & K.F. Lam, On a coupled bulk-surface Allen–Cahn system with an affine linear transmission condition and its approximation by a Robin boundary condition, *Nonlinear Anal.* 184 (2019), 116-147.

P. Colli, G. Gilardi & J. Sprekels, Well-posedness and regularity for a generalized fractional Cahn–Hilliard system, *Atti Accad. Naz. Lincei Rend. Lincei Mat. Appl.* 30 (2019), 437-478.

P. Colli & G. Gilardi, Well-posedness, regularity and asymptotic analyses for a fractional phase field system, *Asymptot. Anal.* 114 (2019), 93-128.

P. Colli & S. Kurima, Time discretization of a nonlinear phase field system in general domains, *Comm. Pure Appl. Anal.* 18 (2019), 3161-3179.

P. Colli, G. Gilardi & J. Sprekels, Nonlocal phase field models of viscous Cahn–Hilliard type, in *Topics in Applied Analysis and Optimisation (Stochastic, Partial Differential Equations and Numerical Analysis)*, M. Hintermüller, J.F. Rodrigues (ed.), *CIM Series in Mathematical Sciences*, Springer, Cham, 2019, pp. 71-100.

P. Colli & S. Kurima, Global existence for a phase separation system deduced from the entropy balance, *Nonlinear Anal.* 190 (2020), 111613, 31 pp.

P. Colli, G. Gilardi & J. Sprekels, Well-posedness and regularity for a fractional tumor growth model, *Adv. Math. Sci. Appl.* 28 (2019), 343-375.

P. Colli, G. Gilardi & J. Sprekels, A distributed control problem for a fractional tumor growth model, *Mathematics* 7 (2019), 792.

P. Colli, H. Gomez, G. Lorenzo, G. Marinoschi, A. Reali & E. Rocca, Mathematical analysis and simulation study of a phase-field model of prostate cancer growth with chemotherapy and antiangiogenic therapy effects, *Math. Models Methods Appl. Sci.* 30 (2020), 1253-1295.

P. Colli, T. Fukao & H. Wu, On a transmission problem for equation and dynamic boundary condition of Cahn–Hilliard type with nonsmooth potentials, *Math. Nachr.* 293 (2020), 2051-2081.

E. Bonetti, P. Colli, L. Scarpa & G. Tomassetti, Bounded solutions and their asymptotics for a doubly nonlinear Cahn–Hilliard system, *Calc. Var. Partial Differential Equations* 59 (2020), Paper No. 88, 25 pp.

P. Colli, G. Gilardi & J. Sprekels, Asymptotic analysis of a tumor growth model with fractional operators, *Asymptot. Anal.* 120 (2020), 41-72.

P. Colli & D. Manini, Sliding mode control for a generalization of the Caginalp phase-field system, *Appl. Math. Optim.* 84 (2021), 1395-1433.

P. Colli, M.H. Farshbaf-Shaker, K. Shirakawa & N. Yamazaki, Optimal control for shape memory alloys of the one-dimensional Frémond model, *Numer. Funct. Anal. Optim.* 41 (2020), 1421-1471.

P. Colli, G. Gilardi & G. Marinoschi, Solvability and sliding mode control for the viscous Cahn–Hilliard system with a possibly singular potential, *Math. Control Relat. Fields* 11 (2021), 905-934.

P. Colli & T. Fukao, Vanishing diffusion in a dynamic boundary condition for the Cahn–Hilliard equation, *NoDEA Nonlinear Differential Equations Appl.* 27 (2020), Paper No. 53, 27 pp.

P. Colli, G. Gilardi & J. Sprekels, An asymptotic analysis for a generalized Cahn–Hilliard system with fractional operators, *J. Evol. Equ.* 21 (2021), 2749-2778.

P. Colli, H. Gomez, G. Lorenzo, G. Marinoschi, A. Reali & E. Rocca, Optimal control of cytotoxic and antiangiogenic therapies on prostate cancer growth,

Math. Models Methods Appl. Sci. 31 (2021), 1419-1468.

P. Colli, A. Signori & J. Sprekels, Second-order analysis of an optimal control problem in a phase field tumor growth model with singular potentials and chemotaxis, ESAIM Control Optim. Calc. Var. 27 (2021), Paper No. 73, 46 pp.

G. Gilioli, P. Colli, M. Colturato, P. Gervasio & G. Sperandio, A nonlinear model for stage-structured population dynamics with nonlocal density-dependent regulation: an application to the fall armyworm moth, Math. Biosci. 335 (2021), 108573, 13 pp.

P. Colli, A. Signori & J. Sprekels, Correction to: Optimal control of a phase field system modelling tumor growth with chemotaxis and singular potentials, Appl. Math. Optim. 84 (2021), 3569-3570.

P. Colli, G. Gilardi & J. Sprekels, Well-posedness for a class of phase-field systems modeling prostate cancer growth with fractional operators and general nonlinearities, Atti Accad. Naz. Lincei Rend. Lincei Mat. Appl. 33 (2022), 193-228.

P. Colli, A. Signori & J. Sprekels, Optimal control problems with sparsity for phase field tumor growth models involving variational inequalities, J. Optim. Theory Appl. 194 (2022), 25-58.

P. Colli, T. Fukao & L. Scarpa, The Cahn–Hilliard equation with forward-backward dynamic boundary condition via vanishing viscosity, SIAM J. Math. Anal. 54 (2022), 3292-3315.

P. Colli, A. Signori & J. Sprekels, Analysis and optimal control theory for a phase field model of Caginalp type with thermal memory, Commun. Optim. Theory 2022 (2022), 4, 31 pp.

P. Colli, G. Gilardi, E. Rocca & J. Sprekels, Well-posedness and optimal control for a Cahn–Hilliard–Oono system with control in the mass term, Discrete Contin. Dyn. Syst. Ser. S 15 (2022), 2135-2172.

F. Auricchio, P. Colli, G. Gilardi, A. Reali & E. Rocca, Well-posedness for a diffusion-reaction compartmental model simulating the spread of COVID-19, Math. Methods Appl. Sci. 46 (2023), 12529-12548.

P. Colli, G. Gilardi, A. Signori & J. Sprekels, Cahn–Hilliard–Brinkman model for tumor growth with possibly singular potentials, Nonlinearity 36 (2023), 4470-4500.

P. Colli, T. Fukao & L. Scarpa, A Cahn–Hilliard system with forward-backward dynamic boundary condition and non-smooth potentials, J. Evol. Equ. 22 (2022), Paper No. 89, 31 pp.

A. Agosti, P. Colli, H. Garcke & E. Rocca, A Cahn–Hilliard phase field model coupled to an Allen–Cahn model of viscoelasticity at large strains, Nonlinearity, 36 (2023) 6589–6638.

**ULTERIORI INFORMAZIONI /
ADDITIONAL INFORMATION**

The teaching experience includes courses in Calculus and Advanced Calculus for students of Mathematics, Physics, Science and Engineering, and courses in Nonlinear Partial Differential Equations for PhD students.

Concerning the research activity, I coauthored more than 200 papers. Basically interested in proving existence and uniqueness theorems; other issues are regularity, asymptotic behavior of the solution with respect to time or to special parameters, stability and convergence as well as error estimates for time discretization or for other approximations, optimal control problems for systems of partial differential equations.

I spent one year in Paris VI in 1985-86 and visited several foreign universities. Attending and contributing to a number of congresses and workshops, being involved in the organization for some of them. I am serving as an editorial board member of the journals *Mathematical Methods in the Applied Sciences* (since 1997) and *Advances in Mathematical Sciences and Applications* (since 2002).

Further information can be found at the web page <http://www-dimat.unipv.it/pier/>

**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*) **Si, acconsento**

October 30, 2023

(Pierluigi Colli)