

Gilles A. Francfort

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Past Professional Experience

1994-2023 Professor, Université Paris-Nord (now called Université Sorbonne Paris-Nord), Villetaneuse.
2014-2022 Visiting Professor (spring semester), Courant Institute, NYU.
2011-2016 Senior Member, Institut Universitaire de France.
1993-1994 Visiting Associate Professor, Department of Mathematics, CMU.
1990-1991 Senior Research Scientist, Courant Institute, NYU.
1983-1992 Research Scientist, Laboratoire Central des Ponts et Chaussées.

Degrees

1989 Habilitation à diriger des recherches, Université Paris 6.
1982 Ph.D., Stanford University.
1978 Ingénieur Civil des Ponts et Chaussées.

Non-academic cursus

1982-1983 Military service, France (did not like it).
1992-1993 NYU Law School (did not like it either).

Honors

2002 Prix Doistau-Blutet, Académie des Sciences (with J.-J. Marigo).

Plenary Conferences

05/98 Congrès National d'Analyse Numérique 1998, Arles, France.
03/10 GAMM 2010, 81st Annual Meeting, Karlsruhe, Germany.
07/11 ICIAM 2011, Vancouver, Canada.

Supervision

1998 Blaise Bourdin: Professor, McMaster University.
2005 Jean-François Babadjian: Professeur, Université Paris-Sud.

Editorial Board

Annales de l'Institut Henri Poincaré (C) Analyse Non Linéaire
Applied Mathematics Research Express (defunct)
Mathematics and Mechanics of Complex Systems (honorary)

Contractual and sponsored activity

2019-2023 Co-Principal Investigator: NSF grant *DMS/DMREF-1922371*
"Elastomers Filled with Electro- and Magneto-Active Fluid
Inclusions: A New Paradigm for Soft Active Materials."
with PI: O. Lopez-Pamies, Co-PIs: I. Chasiotis, Z. Ounaies.
2016-2020 Co-Principal Investigator: NSF grant *DMS-1615839*
"Fracture in Soft Organic Solids – The Variational View."
with PI: O. Lopez-Pamies, Co-PI: Michael J. Shelley.

Various Services

Referee for: Arch. Rat. Mech Anal., *J. Mech. Phys. Solids*, M2AN, M2AS, Comptes Rendus Acad. Sc. Paris, *J. Convex Anal.*, S.I.A.M. J. Appl. Math., *S.I.A.M. J. Math. Anal.*, J. Elasticity, *Port. Mat.*, Interfaces Free Bdaries, *Eur. J. Mech.*, Ann. Fac. Sc. Toulouse, *Appl. Math. Optim.*, Asymp. Anal., *Proc. Royal Soc. London*, Proc. Royal Soc. Edinburgh, *Nonlinear Anal.*, J. Nonlinear Sc., *Com. Part. Dif. Eq.*, Eur. J. Appl. Math., *ESAIM: COCV*, Zeit. Ang. Math. Mech., *Annali di Mat*, Proc. A.M.S., *Cont. Mech and Therm.*, J. Diff. Eqns., *Nonlinearity*, J. Funct. Anal., *Comm. Pure Applied Maths.*, J. Maths Pures Appliquées, *Optimization*, Cont. Discrete Dyn. Systems, M3AS, Annali Scuola Norm. Sup. Pisa, *Comp. Appl. Maths.*, J. Dyn. Differential Eqns., *S.I.A.M. Mult. Mod. Sim.*, IMA J. Applied Maths, *Calc. Var.*, Eng. Fracture Mech. *J. Eur. Math. Soc.*, Int. J. Fracture, *BCAM Springer Briefs*, Int. J. Solids Struct., *J. Ecole Polytechnique*, PNAS, J. Amer. Math. Soc. + about 10 books.

Expertise: European Research Council, International Centre for Mathematical Sciences Research-in-groups, Ecos Sud, Mathematics Responsive Mode, Engineering and Physical Sciences Research Council, IndAM, INRIA Research Project Teams, e-GAP (The Royal Society), Austrian Science Fund (FWF), Israel Science Fundation, Czech Science Foundation (GAČR).

Conferences organized

- 06/92 Member of Organization Committee: *First European Congress of Mathematics*, Paris, July 06 -10, 1992.
- 09/04 Co-organizer with A. Mielke (Stuttgart) of *Workshop on Rate Independent Processes*, Paris, Aug. 30 – Sept. 01, 2004.
- 07/06 Co-organizer with G. Dal Maso (Trieste), V. Ferone (Napoli), F. Murat (Paris) of Special Session: *P.D.E.'s and applications*, in *Joint Meeting Mathematics and Its Applications*, Torino, July 03 – 07, 2006.
- 02/07 Co-organizer with G. Dal Maso (Trieste), A. Mielke (Stuttgart), T. Rubicek (Prague) of Oberwolfach Workshop: *Analysis and Numerics for Rate Independent Processes*, Oberwolfach, Feb. 25 – Mar. 03, 2007.
- 07/07 Co-organizer with K. Hamdache (Palaiseau), L. Mascarenhas (Lisboa), F. Murat (Paris) of Conference: *Des équations aux dérivées partielles au calcul scientifique*, *Congrès en l'honneur de Luc Tartar*, Paris, July 02 – 06, 2007.
- 09/07 Member Scientific Committee CEDYA 2007
X Congreso de Matemática Aplicada, Sevilla, Sept. 24–28, 2007.
- 05/08 Co-organizer with G. Dal Maso (Trieste), A. Garroni (Rome), C. Larsen (Worcester) of four-part mini-symposium: *Damage and Fracture Evolution*, SIAM conference on *Mathematical Aspects of Materials Science*, Philadelphia, May 11 – 14, 2008.
- 09/08 Member Scientific Committee IUTAM Conference on *Variational Concepts with Applications to the Mechanics of Materials*, Bochum, Sept. 22–26, 2008.
- 05/10 Member Organizing Committee SIAM Conference on *Mathematical Aspects of Materials Science*, Philadelphia, May 23–26, 2010.
- 07/14 Co-organizer with M. Kružík (Prague), A. Gloria (Brussels), of Workshop: *Relaxation, Homogenization and Dimensional Reduction in Hyperelasticity*, Paris, March 25 – 27, 2014.
- 08/15 Co-organizer with S. Luckhaus (Leipzig) of Oberwolfach Mini-Workshop: *Scales in Plasticity*, Oberwolfach, Nov. 8 – 14, 2015.
- 01/16 Co-organizer with C. Miehe (Stuttgart) of 15th GAMM-Seminar on Microstructures, Paris, Jan 22 – 23, 2016.
- 05/16 Co-organizer with B. Bourdin (Baton Rouge), C. Larsen (Worcester), C. Maurini (Paris) of BIRS Workshop “Variational Models of Fracture”, Banff, May 9 –13, 2016.
- 05/18 One of 9 co-organizers of Workshop “Vers une vision variationnelle de la mécanique”, Porquerolles, May 31 –June 2, 2018.
- 05/20 Member Organizing Committee SIAM Conference on *Mathematical Aspects of Materials Science*, Bilbao, May 18 – 22, 2020; took place online May 2021.

Invited Visits outside France

New York University: many times since 06/84 (stays of varying length).
University of Michigan, Ann Arbor: 08/84 (1 week); 06/85 (2 weeks); 04/86 (1 week); 12/88 (1 week).
California Institute of Technology: 04/86 (1 week); 06/97 (1 week); 06/98 (2 months); 08/02(6 weeks).
Carnegie Mellon University: 10/91(1 week); 04/91(1week); 12/94 (1 week); 03/96 (1 month); 03/97 (2 weeks); 11/98 (1 week); 01/00 (1 week); 09/00 (1 week); 10/01 (3 weeks); 11/02 (3 weeks); 11/03 (3 weeks); 10/04 (2 weeks); 11/13 (1 week); 11/14(1 week).
Mathematical Science Research Institute, Berkeley: 01/91 (2 weeks).
University of Minnesota: 04/91(1 week); 03/94(1 week); 06/96(1 week).
University of Utah, Salt Lake City: 04/96 (1 month); 01/05(1 week).
University of California, Los Angeles: 07/96 (1 month).
Rice University: 10/95 (1 week).
Università di Napoli: 12/84 (1 week).
Danmarks Tekniske Hojskole: 02/86 (1 week).
Universidade de Lisboa: 06/86 (1 week).
I.C.T.P., Trieste: 10/85 (2 weeks); 01/90 (3 weeks).
Heriot-Watt University: 06/86 (1 week); 12/17 (2 days).
Universidad Complutense, Madrid: 02/95 (1 week).
Universidad de Chile, Santiago: 06/96 (1 month).
Max-Planck Institut fur Mathematik, Leipzig: 03/98 (1 week); 05/98 (2 weeks), 11/97 (3 weeks); 04/08(3 days)..
Worcester Polytechnic Institute: 01/00(1 week), 08/01(1 week); 11/02(1 week); 11/14(3 days).
Isaac Newton Institute, Cambridge: 10/99(8 weeks)
Universidad de Sevilla: 04/00(1 week).
Università di Roma 1: 12/01(2 weeks); 11/07(1 week).
Università di Roma 2: 12/02(1 week); 02/05(1 week); 12/19 (3 days).
S.I.S.S.A.: 01/03(3 weeks); 04/13(2 weeks); 05/15 (1 week).
University of Warwick: 06/03(1 week).
Rutgers University: 11/04(1 week).
Scuola Normale Superiore di Pisa: 10/06(1 month).
Oxford University: 12/06(1 week).
University of Bristol: 06/08(1 week).
Università di Brescia: 07/10(3 days).
McGill University: 01/11(3 days).
Cornell University: 05/11(3 days).
Università di Pavia: 12/11(3 days); 06/12(3 days); 10/16(1 week).
Technische Universität München: 07/12(3 days).
Technische Universität Dortmund: 03/13(3 days).
University North Texas: 10/13(4 days).
Stanford University: 02/02 (2 days); 12/15(3 days).
University of Illinois at Urbana-Champaign: 09/15 (3 days).
Purdue University: 04/16 (3 days).
Schrödinger Institute, Vienna: 06/16 (2 weeks).
University of Texas at Austin: 04/17 (3 days).
Louisiana State University, Baton Rouge: 04/19 (4 days).
Technische Universität Braunschweig: 06/19 (4 days).
ICERM, Brown University: 10/21 (3 days).
McMaster University, Hamilton: 03/23 (3 days).

Seminars

*: *colloquium* / 📺: *remote seminar*

- 1983 ONERA, Université Nancy 1, Ecole Mines Nancy, Ecole Polytechnique.
1984 Ecole Normale Supérieure, Université Paris 6, Academia Navale de Napoli, Ecole Polytechnique.
1985 Université Paris 6, Université de Metz, University of Michigan.
1986 Université Paris 6, Université de Chambéry, Danmarks Tekniske Hojskole, University of Michigan, Universidade de Lisboa.
1988 Université du Languedoc, New Jersey Institute of Technology, University of Michigan, Université Paris 6.
1989 Carnegie Mellon University.
1990 Université de Toulon, Princeton University, Université Paris 6, Courant Institute.
1991 University of Delaware, University of Minnesota(2), Courant Institute, Carnegie Mellon University.
1992 Collège de France, Ecole Polytechnique, Université Paris 6, Université Paris-Sud.
1993 Carnegie Mellon University, Ecole Polytechnique.
1994 Collège de France, Université Paris-Sud, Carnegie Mellon University, Worcester Polytechnic Institute, Ecole Normale Supérieure, University of Minnesota.
1995 Universidad Complutense de Madrid, Rice University*.
1996 Université Grenoble(2), Université Paris 6, Carnegie Mellon University, University of Utah, Universidad de Chile.
1997 Carnegie Mellon University, Université Paris 6, Oxford University.
1998 Université Orléans, Université Paris 6(2), Max Planck Institut Leipzig, Université Nice, Carnegie Mellon University.
1999 Ecole Polytechnique*.
2000 Worcester Polytechnic Institute, Université Paris 6, Universidad de Sevilla, SISSA.
2001 Worcester Polytechnic Institute, Université Versailles, Université Paris 6, Università di Roma 1, Carnegie Mellon University.
2002 Université Paris 6, Université de Rennes, Stanford University, Ecole Nationale des Ponts et Chaussées, Carnegie Mellon University, Worcester Polytechnic Institute.
2003 Courant Institute, Louisiana State University, University of Warwick, Carnegie Mellon University.
2004 Courant Institute, Carnegie Mellon University, Université de Grenoble, Rutgers, Technische Universität Kaiserslautern.
2005 Ecole Polytechnique, Université Paris 6, University of Maryland, University of Utah.
2006 Oxford University, Ecole Polytechnique.
2007 Yeshiva University, Temple University, Worcester Polytechnic Institute, New York University, Brown University, University of Pennsylvania.
2008 Université Rennes*, INRIA, Max Planck Institut Leipzig, University of Bristol.
2009 Collège de France, Courant Institute, Fédération Francilienne de Mécanique.
2011 McGill University, CRS-ISM Université de Montréal*, GDR Chant, Ecole Polytechnique(2), Cornell University, Courant Institute, Institut des Hautes Etudes Scientifiques (Séminaire Schwartz).

- 2012 Université Paris 6, Université de Grenoble, Courant Institute(2),
Technische Universität München, Temple University.
- 2013 Technische Universität Dortmund, Carnegie Mellon University,
University of North Texas.
- 2014 Courant Institute*, University of Pittsburgh*,
Worcester Polytechnic Institute.
- 2015 Université Paris 6, Université Libre de Bruxelles, Stanford University*.
- 2016 Purdue University* (+seminar), University of Connecticut,
Università di Pavia.
- 2017 University of Texas at Austin, Heriot-Watt University.
- 2018 Courant Institute.
- 2019 Louisiana State University*, Technische Universität Braunschweig,
Université Paris 6 (2 seminars), Università di Roma 1.
- 2020 Westfälische Wilhelms-Universität Münster* .
- 2021 Hebrew University* , Online North East PDE and Analysis Seminar
(ONEPAS) , ICERM Brown University, Université Paris-Sud.
- 2023 McMaster University*, Sorbonne Université.

Communications, lectures during special schools

** : course /# : did not give a talk /📡 : remote conference

09/83	6ème Congrès français de mécanique, Lyon, France.
07/84	International Conference on Numerical Methods for Transient and Coupled Problems, Venezia, Italy.
01/85	Symposium on Energy Release Rates and Path Independent Integrals in Defect and Fracture Mechanics, Bad Honnef, Germany.
10/85**	Workshop on Semi-group Theory, International Center for Theoretical Physics, Trieste, Italy.
07/86	Symposium on Non-Classical Continuum Mechanics: Abstract Techniques and Applications, Durham, UK.
09/86	IUTAM Symposium on Thermomechanical Coupling in Solids, Paris, France.
12/88	SIAM Conference on Random Media, Leesburg, USA.
01/90	Workshop on Composite Media and Homogenization Theory, Trieste, Italy.
03/90	Mécamat, Evian, France.
06/90	Workshop: Mathematical Problems in Non Linear Elasticity, Oberwolfach, Germany.
12/90	Problèmes non linéaires appliqués, Ecole CEA-EDF-INRIA, Clamart, France.
01/91	P.D.E. Conference on Homogenization, Berkeley, USA.
06/91	First European Conference on Elliptic and Parabolic Problems, Pont-à-Mousson, France.
06/92	Topology Design of Structures, Sesimbra, Portugal.
06/93	CIRM meeting on Calculus of Variations, Homogenization and Continuum Mechanics, Luminy, France.
02/94	North American Conference on Smart Structures and Materials, Orlando, USA.
04/94	SIAM Conference on Mathematics of Materials, Pittsburgh, USA.
02/95	Eurhomogenization Conference, Madrid, Spain.
03/95**	Workshop on Shape Optimization, Saint Etienne, France.
06/95	Calculus of Variations and Nonlinear Elasticity, Cortona, Italy.
06/95	Conference on Dynamics of Microstructures, Hanover, Germany.
07/95	Minisymposium Shape Optimization, ICIAM 95, Hamburg, Germany.
07/95**	Conference on Optimal Design, Banach Center, Warsaw, Poland.
08/95	Conference on Structural Optimization, Salt Lake City, USA.
06/96	Workshop on Interface and Thin Films, IMA, Minneapolis, USA.
03/97	IUTAM Symposium on Composites/Active Materials, Cairo, Egypt.
05/97	Second SIAM Conference on the Mathematical Aspects of Materials Science, Philadelphia, USA.
06/97	Workshop: Mathematical Continuum Mechanics, Oberwolfach, Germany.
07/97**	School on Shape Optimization, CEMRACS, Orsay, France.
09/97**	Summer School on the Mathematics of Materials, CIM, Coimbra, Portugal.
09/97	Multiscale II, Leipzig, Germany.
04/99	GAMM 99, Metz, France.
06/99	CIRM meeting on Shape Optimization, Luminy, France.
10-12/99	Workshop on Mathematical developments in solid mechanics and materials science, Isaac Newton Institute, Cambridge, UK.

07/00**	Euroconference on New Mathematical Methods in Continuum Mechanics, Anogia, Greece.
10/00	Symposium on Continuous Damage and Fracture, Cachan, France.
02/01	Workshop on Variational Methods beyond Elasticity, Leipzig, Germany.
06/01	First CSMA-GIMC Workshop on Modern Issues in Modelling and Computation of Damage and Failure, Cefalu, Italy.
07/01**	School on Multi-Scale Problems, CEMRACS, Orsay, France.
12/01**	School on Multiple Scales, Rome, Italy.
01/03**	Course on Brittle Fracture, SISSA, Trieste, Italy.
07/03	CIRM meeting on Shape Optimization, Luminy, France.
08/03	Recent Developments in Modelling Rupture, Foz do Iguacu, Brazil.
09/03	Workshop: P.D.E.'s and Materials, Oberwolfach, Germany.
10/03	Workshop on Homogenization, Orléans, France.
01/04	Third GAMM on Microstructures, Stuttgart, Germany.
06/04	Midnight Sun Homogenization Conference, Narvik, Norway.
08/04	ICTAM04, Warsaw, Poland.
09/04	Variational Methods in Materials Science, Trieste, Italy.
09/04	Homogenization and Shape Optimization, Lisbon, Portugal.
12/04	Workshop: Thermodynamische Materialtheorien, Oberwolfach, Germany.
05/05	Mathematical Modeling in Continuum Mechanics, Alghero, Italy.
05/05	Equations aux dérivées partielles non-linéaires, Tipaza, Algeria.
09/05	Workshop on thin structures, Napoli, Italy.
10/05	Society for Natural Philosophy Meeting, Bari, Italy.
10/05	Workshop on the Calculus of Variations, Pittsburgh, USA.
10/05	AMS Sectional Meeting, Lincoln, USA.
11/05	Miniworkshop: Analysis and Computation of Microstructures in Finite Plasticity, Oberwolfach, Germany.
02/06	Modelling and analysis of phase transitions, Pisa, Italy.
05/06	VIII Congresso SIMAI, Ragusa, Italy.
07/06	SIAM Conference on Analysis of Partial Differential Equations, Boston, USA.
10/06	Workshop on Variational methods in Material Science, Pisa, Italy.
01/07	AMS Annual Meeting, New Orleans, USA.
06/07	Thermomechanical Modeling of Solids, Palaiseau, France.
10/07	SES 2007, College Station, USA.
11/07	Workshop on Rate-Independence, Homogenization and Multiscaling, Pisa, Italy.
02/08**	Fracture and Damage : Formation and propagation of singularities in continuum mechanics, Winter School, Institut Henri Poincaré, Paris, France.
03/08**	Singularities in Mechanics: formation, propagation and microscopic description, Centre Emile Borel, Paris, France.
05/08	SIAM Conference on the Mathematical Aspects of Materials Science Philadelphia, USA.
06/08	Workshop on Geometric Analysis, Elasticity, and PDE on the 60th Birthday of John Ball, Maxwell Institute and Heriot-Watt University, Edinburgh, UK.
09/08	IUTAM Symposium on Progress in the Theory and Numerics of Configurational Mechanics, Erlangen, Germany.

- 06/09** LMS–EPSRC Short Course on the Mathematics of Materials, Oxmos, Oxford University, Oxford, UK.
- 09/09 Homogenization and Optimal Design, Sevilla, Spain.
- 12/09 SIAM Conference on Analysis of PDE’s, Miami, USA.
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- 01/10 New Developments in Elasticity, the Legacy of Robert Hooke, Oxford, UK.
- 02/10 Motions of Interfaces and Non Linear P.D.E.’s, Tours, France.
- 05/10 SIAM Conference on the Mathematical Aspects of Materials Science Philadelphia, USA.
- 07/10** Variational Models and Methods in Solid and Fluid Mechanics, CISM, Udine, Italy.
- 08/10** Ecole Thématique 2010, GDR Chant: Enjeux de Modélisation et Analyse Liés aux Problèmes de Surfaces Rugueuses et de Défauts, Wolfgang Pauli Institute, Wien, Österreich.
- 08/10 Rate-independent systems: Modeling, Analysis, and Computations, B.I.R.S. Workshop, Banff, Canada.
- 09/10 Stability and Nonlinear Solid Mechanics, Institut Henri Poincaré, Paris, France.
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- 07/11** School “Mechanics of Fractures and Second Gradient Theory”, M&Mocs, La Cisterna, Italy.
- 12/11 Workshop: Variational Methods for Evolution, Oberwolfach, Germany.
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- 03/12 Workshop: Mechanics of Materials, Oberwolfach, Germany.
- 06/12 Variational Problems with Multiple Scales, Otranto, Italy.
- 07/12 Exotic Structures and Homogenization, Saint-Petersburg, Russia.
- 09/12 Evolution Problems in Damage, Plasticity and Fracture, Udine, Italy.
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- 02/13 12th GAMM Seminar on Microstructures, Berlin, Germany.
- 04/13** Evolution Problems for Fracture Mechanics, SISSA, Trieste, Italy.
- 05/13 PACAM XIII, Houston, USA.
- 06/13 SIAM Conference on the Mathematical Aspects of Materials Science Philadelphia, USA.
- 06/13 15ème Rencontres Mathématiques de Rouen, Rouen, France.
- 09/13 International Conference on Nonlinear and Multiscale Partial Differential Equations: Theory, Numerics and Applications, Shanghai, China.
- 09/13 Evolution Problems for Material Defects: Dislocations, Plasticity, and Fracture, Trieste, Italy.
- 11/13** Multi-scale and Multi-field Representations of Condensed Matter Behavior, Pisa, Italy.
- 12/13 Workshop: Material Theory, Oberwolfach, Germany.
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- 06/14 International Conference on Length Scale in Solid Mechanics: Mathematical and Physical Aspects, Paris, France.
- 09/14** Analyse Variationnelle et Microstructuration, 3^{ème} école d’été de mécanique, Quiberon, France.
- 12/14 Workshop: Variational Methods for Evolution, Oberwolfach, Germany.
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- 01/15 14th GAMM Seminar on Microstructures, Regensburg, Germany.
- 05/15** Variational Methods for Plasticity & Dislocations, SISSA, Trieste, Italy.
- 05/15 PACAM XV, Champaign, USA.
- 12/15 Workshop Calculus of Variations and its Applications on the 65th birthday of Luisa Mascarenhas, Caparica, Portugal.
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- 05/16 Workshop New Challenges in the Calculus of Variations in honor of the 60th birthday of Irene Fonseca, Montreal, Canada.

06/16	Workshop Advances in the Mathematical Analysis of Material Defects in Elastic Solids, SISSA, Trieste, Italy.
06/16	Workshop Entropy methods, dissipative systems, and applications, Schrödinger Institute, Vienna, Austria.
01/17	16th GAMM Seminar on Microstructures, Dortmund, Germany.
07/17	Workshop on Multiscale Problems and Relaxation in Nonlinear Elasticity, Dresden, Germany.
07/17	Workshop: Material Theories, Oberwolfach, Germany.
08/17**	Free discontinuity problems and applications in fracture, mechanics Research Summer School, Ningbo, China.
02/18	Workshop: Variational Methods for Inelastic Solids, Oberwolfach, Germany.
05/18#	Topics in the Calculus of Variations: Recent Advances and New Trends, B.I.R.S. Workshop, Banff, Canada.
06/18	Celebrating Approximate 60s, Shanghai, China.
06/18	Free Boundary, Free Discontinuity Problems and Applications, Ningbo, China.
08/18	New Trends in the Variational Modeling of Failure Phenomena, Schrödinger Institute Workshop, Vienna, Austria.
11/18	Rencontres Franco-Tchèques de mathématiques, Lyon, France.
01/19	Joint Mathematics Meeting, AMS Special Session on Multiscale Problems in the Calculus of Variations, Baltimore, USA.
03/19#	Phase-Field Models of Fracture, B.I.R.S. Workshop, Banff, Canada.
01/20	Calculus of Variations and Applications, on the Occasion of Gianni Dal Maso's 65th birthday, Trieste, Italy.
03/20	Workshop: Mechanics of Materials, Oberwolfach, Germany.
03/20	Fracture across scales, 2nd Visitors Workshop, Marloffstein, Germany.
03/21#	Workshop: Homogenization Theory: Periodic and Beyond, Oberwolfach, Germany.
02/22	Workshop: Free Boundary Problems and Related Evolution Equations E.S.I., Vienna, Austria.
04/22	Workshop: Polycrystals: Microstructure and Plasticity, ICMS, Edinburgh, UK.
05/22	Calcvar21, Carthage, Tunisia.
06/22	Calcvar21, Carthage, Tunisia.
06/22	20 years of Summer Schools on CalcVar in Rome, Rome, Italy.
06/22	Analysis, PDEs and Applications. Celebrating the 60th anniversary of Professor Nenad Antonić, Dubrovnik, Croatia.
11/22	Applied Analysis: a celebration of the science of Bob Kohn, New York, USA.
04/23	Compensated Compactness and Applications to Materials, B.I.R.S. Workshop, Banff, Canada.
09/23	Variational Methods for Material Failure, FAU Erlangen, Germany.
10/23	Variational and Geometric Structures for Evolution, Levico, Italy.
11/23	New Trends in Homogenization, Roscoff, France.
01/24	23rd GAMM Seminar on Microstructures, Bochum, Germany.
02/24	Workshop: Differential Inclusions and Continuum Mechanics, ETH Zürich, Switzerland.
03/24	Measures and Materials, Warwick, United Kingdom.

List of Publications

1. Homogénéisation et oscillations rapides en thermoélasticité linéaire, C.R.A.S. Paris(1), 295, 1982, 367–370.
2. Conservation laws and material momentum in thermoelasticity, *with A.G. Herrmann*, J. Appl. Mech., 104, 1982, 710-714.
3. Homogénéisation de milieux viscoélastiques linéaires de Kelvin-Voigt, *with D. Leguillon, P. Suquet*, C.R.A.S. Paris(1), 296, 1983, 287-290.
4. Thermodynamique et lois de comportement thermomécanique homogénéisées, *with Q.S. Nguyen, P. Suquet*, C.R.A.S. Paris(2), 296, 1983, 1007-1010.
5. Homogenization and linear thermoelasticity, S.I.A.M. J. Math. Anal., 14(4), 1983, 696-708.
6. Homogenization and fast oscillations in linear thermoelasticity, **in:** Numerical Methods for Transient & Coupled Problems, R. Lewis, E.Hinton, P. Betess, B.Schrefler, eds., Pineridge, Swansea, 1984, 382-393.
7. Homogenization and optimal bounds in linear elasticity, *with F. Murat*, Arch. Rat. Mech. Anal., 94(4), 1986, 307-334.
8. Homogenization and mechanical dissipation in thermoviscoelasticity, *with P. Suquet*, Arch. Rat. Mech. Anal. , 96(3), 1986, 265-293.
9. A contour integral and an energy release rate in thermoelasticity, *with A.G. Herrmann*, Int. J. Sol. Struct., 22(7), 1986, 759-766.
10. Asymptotic thermoelastic behavior of flat plates, *with D. Blanchard*, Quat. Appl. Math., 45(4), 1987, 645-667.
11. Optimal bounds for conduction in two-dimensional, multiphase, polycrystalline Media, *with G.W. Milton*, J. Stat. Phys., 46, 1987, 161-177.
12. Asymptotic transient thermoelastic behavior, **in:** Proceedings of the IUTAM Symposium on Thermomechanical Coupling in Solids, H.D. Bui , Q.S. Nguyen, eds. ,Elsevier, Amsterdam, 1987, 291-304.
13. Study of a doubly non-linear heat equation with no growth assumption on the parabolic term, *with D. Blanchard*, S.I.A.M. J. Math. Anal., 19(5), 1988, 1032-1056.
14. Optimal bounds for conduction in two-dimensional, two phase, anisotropic media, *with F. Murat*, **in:** Proceedings of the Durham Symposium on Non-Classical Continuum Mechanics, R.J. Knops, ed., Cambridge Press, Cambridge, 1987,197-212.
15. Homogenization in thermoelasticity, *with S. Brahim-Otsmane, F. Murat*, **in:** Random Media and Composites, R.V. Kohn, G. W. Milton, eds. , S.I.A.M. Press, Philadelphia, 1989, 13-45.
16. Comportement effectif d'un mélange de matériaux élastiques isotropes ayant le même module de cisaillement, *with L. Tartar*, C.R.A.S. Paris(1), 312, 1991, 301-307.
17. A few results on a class of degenerate parabolic equations, *with D. Blanchard*, Ann. Sc. Norm. Sup. Pisa, 18(2), 1991, 213-249.
18. Mathematical analysis of the damage evolution in a brittle damaging continuous medium, *with J.-J. Marigo*, **in:** Mécanique, modélisation numérique et dynamique des matériaux, Publications du L.M.A., 124, Presses du C.N.R.S., 1991, 245-276.

19. Correctors for the homogenization of the wave and heat equations, *with S. Brahim-Otsmane, F. Murat*, J. Math. Pures et Appl., 71(2), 1992, 197-231.
20. Homogenisation of a class of fourth order equations with application to incompressible elasticity, Proc. Royal Soc. Edinburgh, 120A, 1992, 25-46.
21. Oscillations and energy densities in the wave equation, *with F. Murat*, Comm. Part. Dif. Eq., 17(11&12), 1992, 1785-1865.
22. A numerical algorithm for topology and shape optimization, *with G. Allaire*, **in:** Topology Design of Structures, M. Bendsoe, C. Mota Soares, eds., Kluwer, Dordrecht, 1993, 239-248.
23. Stable damage evolution in a brittle continuous medium, *with J.-J. Marigo*, Eur. J. Mech. A/Solids, 12(2), 1993, 149-189.
24. Combined effects of homogenization and singular perturbations in elasticity, *with S. Muller*, J. reine angew. Math., 454, 1994, 1-35 (featured AMS review).
25. Sets of conductivity and elasticity tensors stable under lamination, *with G.W. Milton*, Comm. Pure Appl. Math., 47, 1994, 1-23.
26. Relaxation in BV versus quasiconvexification in $W^{1,p}$; a model for the interaction between fracture and damage, *with I. Fonseca*, Calc. Variations and PDE, 3(4), 1995, 407-446.
27. Fourth order moments of a nonnegative measure on S^2 and applications, *with F. Murat, L. Tartar*, Arch. Rat. Mech. Anal., 131, 1995, 305-333.
28. A topological approach to shape optimization, *with G. Allaire, A. Bonnetier, F. Jouve*, Z. fur Ang. Math. & Mechanik, 76(S3), 1996, 255-258.
29. Shape optimization by the homogenization method, *with G. Allaire, A. Bonnetier, F. Jouve*, Numer. Math., 76, 1997, 27-68 (featured AMS review).
30. Existence of Minimizers for Non-Quasiconvex Functionals Arising in Optimal Design, *with G. Allaire*, Ann. I.H.P., Anal. Nonlin., 15(3), 1998, 301- 339.
31. Cracks in fracture mechanics: A time-indexed family of energy minimizers, *with J.-J. Marigo*, **in:** IUTAM Symposium on Variation of Domains and Free-Boundary Problems in Solid Mechanics, P. Argoul, M. Frémond, Q.S. Nguyen, eds., Solid Mechanics and its Applications, Vol.66, Kluwer, Dordrecht, 1999, 197-203.
32. Revisiting brittle fracture as an energy minimization problem, *with J.-J. Marigo*, J. Mech. Phys. Solids, 46(2), 1998, 1319-1342.
33. 3d-2d asymptotic analysis of an optimal design problem for a thin film, *with I. Fonseca*, J. reine angew. Math., 505, 1998, 173- 202.
34. Une approche variationnelle de la mécanique du défaut, *with J.-J. Marigo*, ESAIM: Proc., 6, 1998, 57-74 (www.emath.fr/proc/Vol.6/).
35. Numerical experiments in revisited brittle fracture, *with B. Bourdin, J.-J. Marigo*, J. Mech. Phys. Sol., 48(4), 2000, 797-826.
36. 3D- 2D asymptotic analysis for inhomogeneous thin films, *with A. Braides, I. Fonseca*, Indiana U. Maths. J., 49(4), 2000, 1367-1404.
37. Duality relations for nonlinear incompressible 2-dimensional elasticity, *with P. Suquet*, Proc. Royal Soc. Edinburgh, 131A, 2001, 351-369.

38. On the inadequacy of the scaling of linear elasticity for 3d-2d asymptotics in a nonlinear setting,
with I. Fonseca, J. Math. Pures et Appl., 80(5), 2001, 547-562.
39. An asymptotic study of the debonding of thin films,
with K. Bhattacharya, I. Fonseca, Arch. Rat. Mech. Anal., 161, 2002, 205-229.
40. Monotone operators in divergence form with x-dependent multivalued graphs,
with F. Murat, L. Tartar, Boll. Un. Mat. Ital., 7B, 2004, 23-59.
41. The wave equation on a thin domain: energy density and observability.
with P. Gérard, J. Hyp. Diff. Eq., 1(2), 2004, 351-366.
42. On conservation laws and necessary conditions in the calculus of variations,
with J. Sivaloganathan, Proc. Royal Soc. Edinburgh, 132A, 2002, 1361-1371.
43. Vers une théorie énergétique de la rupture fragile,
with J.-J. Marigo, C.R. Mécanique, 330, 2002, 225-233.
44. Revisiting brittle fracture as an energy minimization problem: Comparison of Griffith and Barenblatt surface energy models,
with M. Charlotte, J.-J. Marigo, L. Truskinovsky, **in**: Continuous Damage and Fracture, A. Benallal, Ed., The Data Science Library, Elsevier, Paris, 2000, 7-12.
45. Existence and convergence for quasistatic evolution in brittle fracture,
with C.J. Larsen, Comm. Pure Appl. Maths, 56, 2003, 1465-1500.
46. Bounds on the effective behaviour of a square conducting lattice,
with A. Braides, Proc. Royal Soc. London A, 460(2046), 2004, 1755-1769.
47. Quasistatic crack growth in non-linear elasticity,
with G. Dal Maso, R. Toader, Arch. Rat. Mech. Anal., 176, 2005, 165-225.
48. Spatial heterogeneity in 3D-2D dimensional reduction,
with J.F. Babadjian, ESAIM: COCV, 11(1), 2005, 139-160.
49. Quasistatic evolution in brittle fracture : the case of bounded solutions,
with G. Dal Maso, R. Toader, **in** : Calculus of Variations. Topics from the Mathematical Heritage of Ennio De Giorgi, D. Pallara, Ed., Quaderni di Matematica 14, Aracne, Roma, 2005, 245-266.
50. Griffith theory of brittle fracture revisited : merits and drawbacks,
with J.-J. Marigo, Latin Amer. J. Solids Struct., 2, 2005, 57-64.
51. An introduction to H-measures and their applications,
in : Variational Problems in Materials Science, G. Dal Maso, A. DeSimone, F. Tomarelli, Eds., Progress in Nonlinear Differential Equations and Their Applications 68, Birkhäuser Verlag, Basel, 2006, 85-110.
52. Quasistatic brittle fracture seen as an energy minimizing movement,
GAMM-Mitteilungen, 29(2), 2006, 172-191.
53. Existence results for a class of rate-independent material models with nonconvex elastic energies,
with A. Mielke, J. reine angew. Math., 595, 2006, 55-91.
54. A variational view of partial brittle damage evolution,
with A. Garroni, Arch. Rat. Mech. Anal., 182, 2006, 125-152.
55. Thin elastic films : the impact of higher order perturbations,
with I. Fonseca, G. Leoni, Quarterly Applied Maths., LXV,1, 2007, 69-98 + erratum, Quarterly Applied Maths., LXVI(4), 2008, 781-799.

56. The variational approach to fracture,
with B. Bourdin, J.-J. Marigo, *J. Elasticity*, 91(1-3), 2008, 1-148
(also appeared as a Springer book: ISBN: 978-1-4020-6394-7).
57. Critical Points of Ambrosio-Tortorelli converge to critical points of
Mumford-Shah in the one-dimensional Dirichlet case,
with N. Le, S. Serfaty, *ESAIM: COCV*, 15(3), 2009, 576-598.
58. The proofs of the optimal bounds for mixtures of two anisotropic
conducting materials in two dimensions,
with F. Murat, *Mech. Materials*, 41, 2009, 448-455.
59. Homogenization of monotone operators in divergence form
with x -dependent multivalued graphs,
with F. Murat, L. Tartar, *Ann. Mat. Pura Appl.*, 188(4), 2009,
631-652.
60. Revisiting energy release rates in brittle fracture,
with A. Chambolle, J.-J. Marigo, *J. NonLinear Sci.*, 20(4), 2010,
395-424.
61. When and how do cracks propagate?,
with A. Chambolle, J.-J. Marigo, *J. Mech. Phys. Solids*, 56, 2009,
1614-1622.
62. Quasistatic evolution in non-associative plasticity – The cap model,
with J.-F. Babadjian, M.G. Mora, *SIAM J. Math. Anal.*, 44, 2012,
245-292.
63. Small strain heterogeneous elasto-plasticity revisited,
with A. Giacomini, *Comm. Pure Appl. Maths.*, 65(9), 2012, 1185-1241.
64. Fracture,
with B. Bourdin, in : *Variational Models and Methods in Solid and
Fluid Mechanics*, F. dell'Isola and S. Gavrilyuk, Eds., CISM, Springer,
2014, 107-161.
65. Un résumé de la théorie variationnelle de la rupture,
Séminaire Laurent Schwartz – EDP et applications, Exp. XXII,
2011-2012, 11p., 2013.
66. On the Fleck & Willis homogenization procedure in strain gradient
plasticity,
with A. Giacomini, A. Musesti, *Discrete Contin. Dyn. Syst.*, S., 6(1),
2013, 43-62.
67. On periodic homogenization in perfect elasto-plasticity,
with A. Giacomini, *J. Eur. Math. Soc.*, 16(3), 2014, 409-461.
68. Quasistatic evolution for the Armstrong-Frederick hardening-plasticity
model,
with U. Stefanelli, *Appl. Maths. Res. Exp.*, 2, 2013, 297-344.
69. A critical revisiting of finite elasto-plasticity,
with E. Davoli, *SIAM J. Math. Anal.* 47(1), 2015, 526-565.
70. Loss of Ellipticity through homogenization in linear elasticity,
with M. Briane, *Math. Mod. Meth. Appl. Sciences*, 25(5),
2015, 905-928.
71. The role of a vanishing interfacial layer in perfect elasto-plasticity,
with A. Giacomini, *Chin. Ann. Math.*, 36B(5), 2015, 813-828.
72. The taming of plastic slips in Von Mises elasto-plasticity,
with A. Giacomini, J.-J. Marigo, *Int. and Free Bdaries*, 17(4),
2015, 497-516.
73. A case study for uniqueness of elasto-plastic evolutions: bi-axial test,
with A. Giacomini, J.-J. Marigo, *J. Math. Pures Appl.*, 105, 2016,
198-227.

74. Korn-Poincaré inequalities for functions with a small jump set,
with A. Chambolle, S. Conti, Indiana U. Maths. J., 65(4), 2016,
1373-1399.
75. The elasto-plastic exquisite corpse: A Suquet legacy,
with A. Giacomini, J.-J. Marigo, J. Mech. Phys. Solids, 97, 2016,
125-139.
76. A note on the derivation of rigid-plastic models,
with J.-F. Babadjian, Nonlinear Diff. Eq. and Appl., 23(3), 2016,
article 37.
77. Isotropy prohibits the loss of strong ellipticity through homogenization
in linearized elasticity,
with A. Gloria, Comptes Rendus Mathématique, 354(11), 2016,
1139-1144.
78. Recovering convexity in non-associated plasticity,
Comptes Rendus Mécanique, 346(3), 2018, 198-205.
79. Quasistatic evolution in non-associative plasticity revisited,
with M.G. Mora, Calc. Variations and PDE, 57:11, 2018.
80. Approximation of a brittle fracture energy with a constraint of non-
interpenetration,
with A. Chambolle, S. Conti, Arch. Rat. Mech. Anal., 228(3), 2018,
867-889.
81. Fracture and healing of elastomers: A phase-transition theory
and numerical implementation,
with A. Kumar, O. Lopez-Pamies, J. Mech. Phys. Solids, 112, 2018,
523-551.
82. Fracture with healing: a first step towards a new view of cavitation,
with A. Giacomini, O. Lopez-Pamies, Analysis & PDE, 12(2), 2019,
417-447.
83. A two-dimensional labile aether through homogenization,
with M. Briane, Commun. Math. Phys., 367(2), 2019, 599-628.
84. Past and Present of Variational Fracture,
with B. Bourdin, SIAM News, 52(9), 2019.
85. Revisiting Nucleation in the Phase-Field Approach to Brittle Fracture,
with B. Bourdin, A. Kumar, O. Lopez-Pamies, J. Mech. Phys. Solids,
142, 2020, 104027.
86. Enhancement of elasto-dielectrics by homogenization of active charges,
with A. Gloria, O. Lopez-Pamies, J. Math. Pures et Appl., 156, 2021,
392-419.
87. Variational Fracture: Twenty Years After, Int. J. Fracture, 237, 2022,
3-13.
88. The curious case of 2D isotropic incompressible Neo-Hookean
composites,
with V. Lefèvre, O. Lopez-Pamies, J. Elasticity, 151, 2022, 177-186.
89. Continuity equation and characteristic flow in scalar Hencky plasticity,
with J.-F. Babadjian, Comm. Pure Applied Maths, 76(10), 2023,
2271-2334.
90. The Mathematics of Thin Structures,
with J.-F. Babadjian, G. Di Fratta, I. Fonseca, M. Lewicka, C. Muratov,
Quart. Appl. Math., 81, 2023, 1-64.
91. Liquid filled elastomers: From linearization to elastic enhancement,
with J. Casado-Díaz, O. Lopez-Pamies, M.G. Mora, submitted.

92. Uniqueness and characteristic flow for a non strictly convex variational problem,
with J.-F. Babadjian, submitted.
93. Classical variational phase-field models cannot predict fracture nucleation,
with J. Dolbow, C.J. Larsen, O. Lopez-Pamies, submitted.