

# VITO CRISMALE

## Curriculum Vitae

### Part I - General Informations

Name Vito Crismale  
Birthday 15/07/1988  
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### Part II - Education

- 10/12-09/16 **PhD in Applied Mathematics**, SISSA Trieste (Italy), **cum laude**  
Thesis: *Some results on quasistatic evolution problems for unidirectional processes*  
Supervisors: Prof. G. Dal Maso and Dr. G. Lazzaroni  
Referees: Prof. A. Mielke (WIAS Berlin) and Prof. U. Stefanelli (University of Vienna)
- 10/10-05/12 **Bachelor Degree in Mathematics**, Università degli Studi di Bari Aldo Moro, Bari, *Curriculum in Pure Mathematics*, **110/110 cum laude**  
Thesis: *Metodi variazionali e soluzioni solitoniche per alcune equazioni di campo*  
Supervisors: Prof. D. Fortunato and Prof. L. Pisani  
Scientific field: *Nonlinear Analysis*
- Agosto 11 **Summer school - Perugia 2011**, Scuola Matematica Interuniversitaria (SMI), Functional Analysis (mark A/A), Differential Equations in Mathematical Physics (mark A/A)
- 10/07-07/10 **Bachelor Degree in Mathematics**, Università degli Studi di Bari Aldo Moro, Bari, *Curriculum in Pure Mathematics*, **110/110 cum laude**  
Thesis: *Sull'intersezione completa insiemistica*  
Supervisor: Prof. M. Barile  
Scientific field: *Commutative Algebra*

### Part III - Positions

- 11/20- ... **RTD B (Tenure Track Assistant Professor)**, Dipartimento di Matematica *Guido Castelnuovo*, Sapienza Università di Roma
- 10/18-10/20 **Standard European Fellow Marie Skłodowska-Curie** CMAP, École Polytechnique Palaiseau, Post-Doc
- 10/16-09/18 **Individual Fellowship FMJH, program *Mathématiques Ingénierie***, *Fondation Mathématique Jacques Hadamard*, CMAP, École Polytechnique Palaiseau, Post-Doc
- 10/12-09/16 **PhD fellowship**, SISSA Trieste, PhD Student

## Part IV - Grants and awards

- 2020 Positive evaluation for Professorship - “Abilitazione Scientifica Nazionale a Professore di II Fascia”, Settore concorsuale 01/A3, SSD MAT/05 (Analysis)
- 2021 **Junior Prize ISIMM 2020+21**—The International Society for the Interaction of Mechanics and Mathematics <https://isimm.unipg.it/index.html>
- 2007-2010 **Fellowship for Bachelor Degree in Mathematics**, Istituto Nazionale di Alta Matematica “F. Severi” (INdAM)
- 2010 **Best graduated in Mathematics**, Università degli Studi di Bari Aldo Moro, Bari
- 2017 Positive evaluation for *Maître de Conférences*, Sections 25 e 26, Pure and Applied Maths [https://www.galaxie.enseignementsup-recherche.gouv.fr/ensup/qualification/Resultats\\_2017/MCF\\_qualifies\\_2017.pdf](https://www.galaxie.enseignementsup-recherche.gouv.fr/ensup/qualification/Resultats_2017/MCF_qualifies_2017.pdf)
- Invited talks:**
- 09/02/23 Workshop *Variational Models in Materials Science*, Naples, <https://sites.google.com/view/variame23/home-page?authuser=0>
- 11/07/22 *SIAM Annual Meeting 2022 - MS Advances in Variational Methods and Applications to Materials and Machine Learning*, Pittsburgh, USA <https://www.siam.org/conferences/cm/conference/an22>
- 25/05/22 INdAM Workshop *PHAME2022- PHase field MEthods in applied sciences*, Rome <https://sites.google.com/view/phame2022/?pli=1>
- 18/05/22 CIRM Conference *Beyond Elasticity: Advances and Research Challenges*, CIRM-Luminy, France <https://conferences.cirm-math.fr/2535.html>
- 09/05/22 XXXI Convegno Nazionale di Calcolo delle Variazioni, Levico Terme (TN) <https://sites.google.com/unitn.it/cncdv2022>
- 25/06/21 8th European Congress of Mathematics, Portoroz, Slovenia - Mini Symposium 33
- 20/05/21 SIAM-MS21: *SIAM Conference on Mathematical Aspects of Materials Science* - Mini Symposium 21
- 19/11/19 Workshop *Recent Advances in Mechanics and Mathematics of Materials*, Roma <https://sites.google.com/a/uniroma1.it/ram3/>
- 07/10/19 Journée de Rentrée du CMAP, École Polytechnique Palaiseau, Francia <https://portail.polytechnique.edu/cmap/fr/journee-de-rentree-du-cmap-2019>
- 15/09/19 XXIV Congresso AIMETA-*Associazione Italiana di Meccanica Teorica e Applicata*, Roma - Mini Symposium 1 [http://www.aimeta2019.it/wp-content/uploads/2019/09/Programma-AIMETA\\_definitivo.pdf](http://www.aimeta2019.it/wp-content/uploads/2019/09/Programma-AIMETA_definitivo.pdf)
- 03/09/19 XV Congress COMPLAS-*Conference on Computational Plasticity*, Barcellona, Spagna - Invited section *Theory of Fracture, Crack propagation Criteria, and Crack Tracking Algorithms*, Organizzatori: Anna Pandolfi, Michael Ortiz <https://congress.cimne.com/complas2019/frontal/default.asp>
- 03/03/19 Workshop *Phase-Field Models of Fracture*, BIRS, Banff, Canada <https://www.birs.ca/events/2019/5-day-workshops/19w5207>

- 05/02/19 XXIX Convegno Nazionale di Calcolo delle Variazioni, Levico Terme (TN)  
<http://www.science.unitn.it/cirm/programCDV2019.html>
- 03/09/18 *Meeting on Applied Mathematics and Calculus of Variations*, Università La Sapienza, Roma  
<http://www1.mat.uniroma1.it/people/garroni/meeting2018.html>
- 21/03/18 GAMM 89th Annual Scientific Conference, Munich, Germany - Young Researchers' Mini Symposium  
 YR5 *Variational Aspects of Multiscale Modelling in Materials Science*  
<https://jahrestagung.gamm-ev.de/index.php/2018/2018-scientific-program/2018-yr-minisymposia>
- 05/09/17 XXIII Congresso AIMETA-*Associazione Italiana di Meccanica Teorica e Applicata*, Salerno - Mini Symposium 8  
<http://www.aimeta2017.unisa.it/node/5#overlay-context=node/46>
- 14/02/17 *Miniworkshop on dislocations, plasticity, and fracture*, SISSA, Trieste  
<https://www.math.sissa.it/workshop/miniworkshop-dislocations-plasticity-and-fracture>
- 21/07/16 7th European Congress of Mathematics, Berlin, Germany - Mini Symposium 16  
<http://www.7ecm.de/program/schedule.html>
- 04/07/16 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando (FL), USA - Special Session 68 [http://www.aimsconference.org/conferences/2016/2016\\_schedule.html](http://www.aimsconference.org/conferences/2016/2016_schedule.html)
- 20/01/16 XXVI Convegno Nazionale di Calcolo delle Variazioni, Levico Terme (TN)  
<http://www.science.unitn.it/cirm/programCDV2016.html>

## Part V - Research Grants

- 03/22-03/25 Title: *Analysis of some models in Materials Science with tools of Calculus of Variations and Geometric Measure Theory*,  
 Program: *Sapienza University Projects 2021*,  
 Amount: **14500 €**, Principal Investigator
- 10/18-09/20 Title: **BriCoFra**, *New ideas for the Variational Approach to Brittle and Cohesive Fracture*,  
 Program: *H2020-MSCA-IF-2017, Action MSCA-IF-EF-ST (Standard EF), Project n.793018*,  
 Amount: **173076 €**, Principal Investigator (individual fellowship)
- 10/16-09/18 Title: *Evolutionary models for elastoplasticity coupled with damage*  
 Program: Investissement d'avenir project, reference ANR-11-LABX-0056-LMH, LabEx LMH  
 Amount: **70000 €**, Principal Investigator (individual fellowship)
- 2016 Title: *Multiscale analysis of complex systems with variational methods*  
 Program: Progetto INdAM-GNAMPA 2016  
 Amount: **3200 €**, Member (8 collaborators, coordinator Dr. G. Lazzaroni)

## Part VI - Teaching

- 09/22-01/23 *Analisi*, I year Bachelor in Physics (90h)
- 09/21-01/22 *Analisi*, I year Bachelor in Physics (90h)

- 03/21-06/21 *Istituzioni di Matematica 2*, I year Bachelor in Chemistry (60h)
- 11/20-01/21 *Calcolo e Biostatistica*, I year Bachelor in Biology (40h, with Dr. E. Agliari)
- 03/19-04/19 Practical Exercises (TP), *Algorithmes d'Optimisation*, III year Bachelor in 'Mathématiques et Interactions, et Double Licence', Université Paris Sud / Paris Saclay, Orsay, France (14h)
- 09/18-01/19 *Équations Différentielles Ordinaires*, III year Bachelor in 'Mathematics et Interactions', Université Paris Sud / Paris Saclay, Orsay, France (52,5 h)
- 09/17-01/18 Theoretical Exercises (TD), *Mathématiques et Calcul*, I year Bachelor in 'Mathématiques et Informatique', Université Paris 5 Descartes (72h)
- 09-10/17 Theoretical Exercises (TD), *Linear Algebra and Optimisation*, I year Master Data Science for Business, École Polytechnique and HEC Paris (12h)

## Part VII - Scientific Activities

### Other Invited Talks

- 17/11/22 Università di Siena
- 27/10/20 Center for Nonlinear Analysis Seminar, Carnegie Mellon University, Pittsburgh (USA)
- 02/03/20 Séminaire d'Analyse non linéaire et EDP, Universités de Bruxelles et Louvain-la-Neuve, Belgium
- 13/11/19 Università di Trento
- 26/02/19 Séminaire Modélisation, Analyse et Calcul de l'Institut de Mathématiques de Toulouse, France
- 10/01/19 Università di Brescia
- 27/11/18 Università di Pavia
- 05/11/18 Università di Napoli
- 09/10/18 Séminaire de l'équipe ACSIOM, IMAG Montpellier, France
- 03/07/18 Congresso SIMAI, minisymposium 28, Roma
- 02/05/18 Seminario *Analysis and differential equations*, CMAF, Lisbona, Portugal
- 06/02/18 Séminaire de l'équipe EDP - IECL, Nancy, France
- 25/01/18 München-Augsburg Analysis Oberseminar - TUM, München, Germany
- 18/01/18 Séminaire de l'équipe Analyse Numérique et EDP - Université Paris Sud, Orsay, France
- 26/09/17 Università di Brescia
- 06/03/17 Università *La Sapienza*, Roma
- 30/01/17 Seminar for *GdT Calcul des Variations* - Université Paris-Dauphine, France
- 26/10/15 Analysis Junior Seminars, SISSA, Trieste
- 03/09/15 Mathematical Colloquium, Università di Bari

## Organization of Meetings

- 2022 With Proff. A. Garroni, A. Malusa, E. Spadaro, Event *20 years of Summer Schools on CalcVar in Rome*, 13-17 June 2022, Rome  
<https://sites.google.com/uniroma1.it/summerschool2022>
- 2021 With Proff. L. Freddi, G. Lazzaroni, and Dr. G. Orlando, 3 minisimposia at *Congresso Nazionale 2018 SIMAI-Società Italiana di Matematica Applicata e Industriale*, 30/08-03/09 2018, Parma  
<http://www.simai.unipr.it/conference-program/1/>
- 2019 With Dr. F. Iurlano and Dr. G. Orlando, Workshop *Calculus of Variations and Applications in Trani*, 28-31 October 2019, Trani (BT)  
<https://sites.google.com/view/cvatrani2019/>
- 2018 With Dr. G. Lazzaroni, 2 minisimposia at *Congresso Nazionale 2018 SIMAI-Società Italiana di Matematica Applicata e Industriale*, 02-06 July 2018, Rome  
<https://ocs.simai.eu/index.php/SIMAIcongress/SIMAI2018>

## Institutional appointments

- 2022/23 Member of Università Sapienza Research Commission
- 2021-23 Member of Maths Dept. Commission for preparation of Maths Olympic Games

## Research Visits

- 09-12/12/18 University of Münster, Germany, invited by Prof. M. Friedrich
- 22-28/11/18 Università di Pavia, invited by Prof. M. G. Mora
- 02-05/05/18 CMAF Lisbona, Portugal, invited by Prof. N. van Goethem
- 22-31/01/18 TUM München, Germany, invited by Prof. M. Cicalese
- 25-28/09/17 Università di Brescia, invited by Prof. R. Rossi
- 06-10/03/17 Università *La Sapienza* di Roma, invited by Prof. A. Garroni

## Editorial Activity

- Referee for Calc. Var. Partial Diff. Equ. (CVPDE), SIAM Journal on Mathematical Analysis (SIMA), Math. Models Methods Appl. Sci. (M3AS), ESAIM COCV, Zeit. Angew. Math. Mech. (ZAMM), Math. Modelling Numer. Anal. (M2AN), Math. Eng. (MinE), Math. Methods Appl. Sci. (M2AS)
- Reviewer for Mathematical Reviews/MathSciNet

## Participation to congresses/schools (besides events where speaker)

- 27-31/01/20 *Calculus of Variation and Applications (workshop for G. Dal Maso 65th birthday)*, SISSA Trieste
- 16-19/09/19 *6th Applied Mathematics Symposium Münster: recent advances in the Calculus of Variations*, University of Münster
- 29-31/10/18 Workshop *New developments in PDEs and related topics*, Università di Napoli
- 15-16/06/17 Workshop in honour of G. Francfort *From Solid Mechanics to Mathematical Analysis*, IHP Paris

- 2014-2020 *Convegno Nazionale di Calcolo delle Variazioni*, Levico Terme, (TN) (Every year for 1 week in February)
- 2015-2018 Summer schools and meetings all'Università *La Sapienza*, Roma
- 25-28/10/16 Workshop *Geometric Measure Theory, Shape Optimisation, and Free Boundaries*, SISSA, Trieste
- 19-23/09/16 Conference *A Mathematical Tribute to Ennio De Giorgi*, SNS, Pisa
- 02-05/15 Intensive Trimester *Variational Models for Plasticity and Dislocations*, SISSA, Trieste
- 10-14/02/14 Winter school on Calculus of Variations in Physics and Materials Science, Würzburg, Germany

## Part VIII - Publications

- [1] V. Crismale, *Globally stable quasistatic evolution for a coupled elastoplastic–damage model*, **ESAIM Control Optim. Calc. Var.** **22**, 883-912 (2016)
- [2] V. Crismale, G. Lazzaroni, *Viscous approximation of quasistatic evolutions for a coupled elastoplastic-damage model*, **Calc. Var. Partial Differ. Equ.** **55 : Art. 17** (2016)
- [3] V. Crismale, *Globally stable quasistatic evolutions for strain gradient plasticity coupled with damage*, **Ann. Mat. Pura Appl.** **196**, 641-685 (2017)
- [4] V. Crismale, G. Lazzaroni, *Quasistatic crack growth based on viscous approximation: a model with branching and kinking*, **Nonl. Diff. Eqns. Appl. (NoDEA)** **24 : Art. 7** (2017)
- [5] V. Crismale, G. Lazzaroni, G. Orlando, *Cohesive fracture with irreversibility: quasistatic evolution for a model subject to fatigue*, **Math. Models Methods Appl. Sci. (M3AS)**, **28**, 1371-1412 (2018)
- [6] V. Crismale, G. Orlando, *A Reshetnyak-type lower semicontinuity result for linearised elasto-plasticity coupled with damage in  $W^{1,n}$* , **Nonl. Diff. Eqns. Appl. (NoDEA)** **25 : Art. 16** (2018)
- [7] A. Chambolle, V. Crismale, *A density result in  $GSBD^p$  with applications to the approximation of brittle fracture energies*, **Arch. Ration. Mech. Anal.** **232**, 1329-1378 (2019)
- [8] A. Chambolle, V. Crismale, *Compactness and lower semicontinuity in  $GSBD$* , **J. Eur. Math. Soc. (JEMS)** **23**, 701-719 (2021)
- [9] V. Crismale, *On the approximation of  $SBD$  functions and some applications*, **SIAM J. Math. Anal.** **51**, 5011-5048 (2019)
- [10] R. Alessi, V. Crismale, G. Orlando, *Fatigue effects in elastic materials with variational damage models: A vanishing viscosity approach*, **J. Nonlinear Sci.** **29**, 1041-1094 (2019)
- [11] A. Chambolle, V. Crismale, *Phase-field approximation of some fracture energies*, **Adv. Calc. Var.** **14**, 475-498 (2021)
- [12] A. Chambolle, V. Crismale, *Existence of strong solutions to the Dirichlet problem for the Griffith energy*, **Calc. Var. Partial Differ. Equ.** **58: Art. 136** (2019)
- [13] V. Crismale, *Density in  $SBD$  and approximation of fracture energies*, **Atti Accad. Naz. Lincei Rend. Lincei Mat. Appl.** **30**, 533-542 (2019),
- [14] V. Crismale, G. Orlando, *A lower semicontinuity result for linearised elasto-plasticity coupled with damage in  $W^{1,\gamma}$ ,  $\gamma > 1$* , **Mathematics in Engineering** **2**, 101-118 (2019)

- [15] V. Crismale, R. Rossi, *Balanced viscosity solutions to a rate-independent coupled elasto-plastic damage system*, **SIAM J. Math. Anal.** **53**, 3420-3492 (2021),
- [16] V. Crismale, M. Friedrich, *Equilibrium configurations for epitaxially strained films and material voids in three-dimensional linear elasticity*, **Arch. Ration. Mech. Anal.** **232**, 1041-1098 (2020),
- [17] J.-F. Babadjian, V. Crismale, *Dissipative boundary conditions and entropic solutions in dynamical perfect plasticity*, **J. Math. Pures Appl.** **148**, 75-127 (2021)
- [18] V. Crismale, G. Scilla, F. Solombrino, *A derivation of Griffith functionals from discrete finite-difference models*, **Calc. Var. Partial Differ. Equ.** **59**: Art. **193** (2020)
- [19] V. Crismale, M. Friedrich, F. Solombrino, *Integral representation for energies in linear elasticity with surface discontinuities*, **Adv. Calc. Var.** **15**, 705-733 (2020)
- [20] V. Crismale, A. Chambolle, *Equilibrium configurations for nonhomogeneous linearly elastic materials with surface discontinuities*, **Ann. Sc. Norm. Super. Pisa Cl. Sci.**, [https://doi.org/10.2422/2036-2145.202006\\_002](https://doi.org/10.2422/2036-2145.202006_002)
- [21] V. Crismale, L. De Luca, A. Kubin, A. Ninno, M. Ponsiglione, *The variational approach to  $s$ -fractional heat flows and the limit cases  $s \rightarrow 0^+$  and  $s \rightarrow 1^-$* , **J. Funct. Anal.** **284**, Article 109851 (2023)
- [22] V. Crismale, *Energetic solutions for the coupling of associative plasticity with damage in geomaterials*, **Nonlinear Analysis** **222**, Article 112957 (2022)
- [23] V. Crismale, A. Kubin, A. Ninno, M. Ponsiglione, *Failure of crystallization for generalized Lennard-Jones potentials and coarse graining to a rotating stars problem in one dimension*, **Nonlinear Analysis**, Article 113046 (2022)
- [24] V. Crismale, G. Lazzaroni, R. Rossi, *Singular limits of a coupled elasto-plastic damage system as viscosity and hardening vanish*, **Ann. Mat. Pura Appl.**, <https://doi.org/10.1007/s10231-022-01280-0>
- [25] V. Crismale, A. Chambolle, *A general compactness theorem in  $G(S)BD$* , Submitted

Rome, 12/02/2023