

Davide Donati

TUM, Munich | davide.donati@tum.de

Current position

Postdoctoral researcher, TUM Munich, Oct 2026 – present
• Member of the Emmy Noether Junior Research Group led by Dr. Leonard Kreutz.

Education

Ph.D. in Mathematical Analysis, *cum Laude*, SISSA, Trieste Oct 2022 – Sept 2026
• Thesis title: “Some new applications of Γ -convergence to free discontinuity problems, phase transitions, and nonlocal models”
• Advisors: Prof. Andrea Braides and Prof. Gianni Dal Maso

MSc in Mathematics, Università degli studi di Trieste, Trieste. Oct 2020 – July 2022
• Advisor: Prof. Gianni Dal Maso
• Final Grade: 110/110 *cum Laude*

BSc, Università degli studi di Roma La Sapienza, Rome Oct 2017 – July 2020
• Advisor: Prof. Adriana Garroni
• Final Grade: 110/110
• During the third year of the Bachelor program I spent a semester as an Erasmus student at Aix-Marseille Université, where I took classes in French on Functional Analysis, Measure Theory, Probability, and Advanced Algebra

High School Diploma, Liceo Scientifico Isaac Newton, Rome Sep 2012 – July 2017
• Final Grade: 100/100 *cum Laude*

Honors and Awards

- Recipient of a two years merit-based scholarship granted by SISSA to students of the master program in mathematics of the University of Trieste. The scholarship was awarded after a competitive selection process.
- Diploma of the “Percorso Formativo Comune”, awarded by SISSA, after the completion of an excellence program aimed at introducing to research students of the master in mathematics of the University of Trieste.

Published Papers

- (6) G.C. Brusca, D. Donati, and C. Trifone, **Singular perturbations models in phase transitions for anisotropic higher-order materials**, Calc. Var. Partial Differential Equations, 64 (2025), Paper No. 243.
- (5) G. Dal Maso and D. Donati, **Homogenization of vectorial free-discontinuity functionals with cohesive type surface terms**, Proc. Roy. Soc. Edinburgh Sect. A, Published online 2025.
- (4) G.C. Brusca, D. Donati, and M. Solci, **Higher-Order Singular Perturbation Models for Phase Transitions**, SIAM J. Math. Anal., 57(3) (2025).
- (3) D. Donati, **A new space of generalised vector-valued functions of bounded variation**, NoDEA Nonlinear Differential Equations Appl., 32 (2025), Paper No. 59.
- (2) A. Braides, G.C. Brusca, and D. Donati, **Another look at elliptic homogenization**, Milan J. Math. 92 (2024), Paper No. 1.
- (1) G. Dal Maso and D. Donati, **Gamma-convergence of quadratic functionals perturbed by bounded linear functionals**, Nonlinear Anal. 238 (2024), Paper No. 113395.

Preprints

- (5) G. Dal Maso, D. Donati **A remark on the Korn–Poincaré–Sobolev inequality for functions of generalised bounded deformation**, (2026), Submitted
- (4) D. Donati, M. Friedrich **Structured deformations for energies with general surface terms**, (2026) ArXiv Preprint:2606.10556, Submitted
- (3) G.C. Brusca, D. Donati, S. Scalabrino, C. Trifone, and E. Voglino, **Γ -convergence of convolution-type functionals for free discontinuity problems**, (2026) ArXiv Preprint:2603.24192, Submitted
- (2) G. Dal Maso and D. Donati, **Γ -convergence and homogenisation for free discontinuity functionals with linear growth in the space of functions with bounded deformation**, (2026) ArXiv Preprint:2601.19591, Submitted
- (1) G. Dal Maso and D. Donati, **A matrix-valued measure associated to the derivatives of a function of generalised bounded deformation**, (2025) ArXiv Preprint:2506.19978v1, Submitted

Seminars and Presentations

Invited Talks:

- (7) AIMS Conference in Athens, Special Session: Defects, Microstructures, and Failure: Multiscale Variational Models, 6-10 July 2026
"Homogenisation of free discontinuity problems with cohesive surface terms"
- (6) Universität of Wien, 24 Apr 2026
"Higher-order singular perturbation models for phase transitions"
- (5) Hausdorff Center for Mathematics, Bonn, 20 Nov 2025
"A matrix-valued measure associated to the derivatives of a function of generalised bounded deformation"
- (4) Calculus of Variations at the Orangery, FAU Erlangen, 29 Oct 2025
"A matrix-valued measure associated to the derivatives of a function of generalised bounded deformation"
- (3) Analysis Junior Seminar, SISSA 17 Oct 2025
"A matrix-valued measure associated to the derivatives of a function of generalised bounded deformation"
- (2) Università degli Studi di Napoli Federico II, 4 Nov 2024
" Higher-Order Singular Perturbation Models for Phase Transitions"
- (1) Analysis Junior Seminar, SISSA 18 Nov 2023
"Another look at elliptic homogenization"

Contributed Talks:

- (2) XXXV Convegno Nazionale di Calcolo delle Variazioni, Riccione, 10 February 2026
"A matrix-valued measure associated to the derivatives of a function of generalised bounded deformation"
- (1) Calculus of Variations and applications , CIRM, Marseille 15 January 2026
"A matrix-valued measure associated to the derivatives of a function of generalised bounded deformation"

Poster Presentations:

- (3) Geometric Methods in Calculus of Variations , Pisa 8 July 2025
"A matrix-valued measure associated to the derivatives of a function of generalised bounded deformation"

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| (2) Mathematical Analysis and Applications, Como
"Homogenization of vectorial free-discontinuity functionals with cohesive type surface terms" | 12 June 2025 |
| (1) Calculus of Variations and Nonlinear Analysis in the Applied Sciences, Rome
"Another look at elliptic homogenization" | 6 June 2024 |

Visiting periods

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| (4) Visit to Leonard Kreutz, at TUM Munich, Germany | 6–12 Sept 2026 |
| (3) Visit to Stefano Almi and Emanuele Tasso, at TU Wien, Austria | 19–24 Apr 2026 |
| (2) Visiting period in Manuel Friedrich's group, at Johannes Kepler University Linz, Austria | 1 March–5 June 2026 |
| (1) Visit to Roberto Alicandro and Chiara Leone, at Università Federico II of Naples. | 3–7 Nov 2024 |

Participations to Research Projects

- Participant to the INdAM – GNAMPA Project 2024 "Asymptotic analysis of nonlocal variational problems".

Organization Activities

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| • Organizer (together with L. Cortelli, C. Trifone, and M. Zanardini) of the 2025 edition of the Junior Math Days . | 1-3 Dec 2025 |
| • Organizer (together with V. Bais, A. Rosana, C. Trifone, E. Vitale, and S. Vincini) of the 2024 edition of the Junior Math Days , a conference of three days held at SISSA aimed at master students who want to pursue a career in research. | 2-4 Dec 2024 |
| • Organizer (together with G.C. Brusca, A. Ivagnes, M. Khamlich, M.T. Rotolo, and P. Siena) of the 2024 cycle of seminars " Analysis Junior Seminars " at SISSA. | 2024 |

Teaching Activities

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| • Tutoring activities for the course " Meccanica Analitica " (50 hours),
Dipartimento di Matematica e Geoscienze, Università degli studi di Trieste. | Spring 2021 |
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