

Romain Petit

POSTDOCTORAL RESEARCHER IN APPLIED MATHEMATICS

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Academic positions

Postdoctoral researcher

CNRS, ÉCOLE NORMALE SUPÉRIEURE

- Topic: analysis of transformers
- Host: Gabriel Peyré

Paris, France

Since 10/2024

Postdoctoral researcher

MACHINE LEARNING GENOA CENTER (MALGA), UNIVERSITY OF GENOA

- Topic: nonlinear inverse problems
- Host: Giovanni S. Alberti

Genoa, Italy

01/2023 - 09/2024

Education

PhD, applied mathematics

UNIVERSITÉ PARIS DAUPHINE - PSL

- Reconstruction of piecewise constant images via total variation regularization: exact support recovery and grid-free numerical methods
- Supervisors: Vincent Duval and Yohann De Castro
- Committee: B. Buet, A. Chambolle, M. Dambriane (reviewer), S. Masnou, G. Peyré (president), O. Scherzer (reviewer)

Paris, France

10/2019 - 12/2022

Master of science, mathematics vision and learning (*Master MVA*)

ÉCOLE NORMALE SUPÉRIEURE PARIS-SACLAY

Paris, France

2018 - 2019

Master of science, applied mathematics (*diplôme d'ingénieur*)

ÉCOLE NATIONALE DES PONTS ET CHAUSSÉES

Paris, France

2015 - 2019

Scientific contributions

PREPRINTS

[6] On the global convergence of gradient descent for wide shallow models with bounded nonlinearities

ROMAIN PETIT, CLARICE POON, GABRIEL PEYRÉ

[arxiv:2605.10775](https://arxiv.org/abs/2605.10775)

2026

[5] A convex lifting approach for the Calderón problem

GIOVANNI S. ALBERTI, ROMAIN PETIT, SIMONE SANNA

[arxiv:2507.00645](https://arxiv.org/abs/2507.00645)

2025

ARTICLES

[4] On the nonconvexity issue in the radial Calderón problem

GIOVANNI S. ALBERTI, ROMAIN PETIT, CLARICE POON, IRÈNE WALDSPURGER

SIAM Journal on Imaging Sciences (accepted), [arxiv:2507.03379](https://arxiv.org/abs/2507.03379)

2026

[3] Localization of point scatterers via sparse optimization on measures

GIOVANNI S. ALBERTI, ROMAIN PETIT, MATTEO SANTACESARIA

SIAM Journal on Imaging Sciences, [arxiv:2402.00737](https://arxiv.org/abs/2402.00737)

2024

[2] Exact recovery of the support of piecewise constant images via total variation regularization

YOHANN DE CASTRO, VINCENT DUVAL, ROMAIN PETIT

Inverse Problems, [arxiv:2307.03709](https://arxiv.org/abs/2307.03709)

Short version (in French): GRETSI 2023, [hal-04171535](https://arxiv.org/abs/2307.03709)

2024

[1] Towards off-the-grid algorithms for total variation regularized inverse problems

YOHANN DE CASTRO, VINCENT DUVAL, ROMAIN PETIT

Journal of Mathematical Imaging and Vision, [arxiv:2104.06706](https://arxiv.org/abs/2104.06706)

Short version: SSVN 2021, [arxiv:2104.06706v2](https://arxiv.org/abs/2104.06706v2)

2023

SOFTWARES

RadialCalderon.jl

Resolution of the Calderón problem with piecewise constant radial conductivities

github.com/rpetit/RadialCalderon.jl (documentation available at rpetit.github.io/RadialCalderon.jl)

Julia

PointScat

Localization of pointlike inhomogeneities in an inverse acoustic scattering problem

github.com/rpetit/pointscat

Python (JAX)

TV-SFW

Grid-free numerical resolution of least squares problems with total (gradient) variational regularization

github.com/rpetit/tvsfw

Python

PyCheeger

Numerical resolution of a generalized Cheeger problem

github.com/rpetit/pycheeger

Python

Teaching

Université Paris Dauphine - PSL

2019 - 2022

DEPARTMENT OF APPLIED MATHEMATICS

- Algebra (bachelor 1st year), courses and exercise sessions, 120 hours
- Probabilities (bachelor 1st year), exercise sessions, 20 hours

Talks

INTERNATIONAL CONFERENCES

Applied Inverse Problems Conference (AIP)

Göttingen, Germany

Sept. 2023

Conference on Calculus of Variations

Lille, France

July 2022

International Conference on Computational and Methodological Statistics (CMStatistics)

London, UK

Dec. 2021

International Conference on Scale Space and Variational Methods in Computer Vision (SSVM)

Online

May 2021

NATIONAL CONFERENCES

Journées SMAI MODE

Nice, France

March 2026

Colloque Francophone de Traitement du Signal et des Images (GRETSI)

Grenoble, France

Sept. 2023

Congrès National d'Analyse Numérique (CANUM)

Evian, France

June 2022

SEMINARS AND WORKSHOPS

Computational Imaging and Learning winter school (Machine Learning Genoa Center)

Genoa, Italy

Feb. 2026

Workshop Inverse Problems and Imaging (CIRM)

Marseille, France

Oct. 2025

MAP5 imaging seminar (Université Paris Cité)

Paris, France

Nov. 2024

10 years of the INRIA team MOKAPLAN

Fontainebleau, France

June 2024

Statistics, Probabilities, Optimization and Control seminar (Institut de Mathématiques de Bourgogne)

Dijon, France

Feb. 2024

Applied Analysis seminar (Institut de Mathématiques de Marseille)

Marseille, France

Dec. 2023

Workshop Off-the-grid and Continuous Methods for Optimization and Inverse Problems in Imaging <i>Paris, France</i>	Nov. 2023
Paris-Saclay Signal Seminar <i>Paris, France</i>	Nov. 2023
Imaging in Paris seminar <i>Paris, France</i>	Nov. 2023
Machine Learning and Signal Processing seminar (ENS Lyon) <i>Lyon, France</i>	Oct. 2023
Seminar of the INRIA team MORPHEME <i>Sophia-Antipolis, France</i>	April 2023
Inverse Problems and Mathematical Imaging seminar (University of Graz) <i>Graz, Austria</i>	Nov. 2022
Calculus of Variations seminar (GT CalVa) <i>Paris, France</i>	May 2022
CEREMADE young researchers seminar (Université Paris Dauphine - PSL) <i>Paris, France</i>	Nov. 2021

Research visits

Universidad de los Andes, one month (collaborator: Mauricio Velasco) <i>Bogotá, Colombia</i>	Oct. 2019
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Grants

- 5k€ from the Fondation Mathématique Jacques Hadamard, PGM young project EIT Lift

Service

Responsibilities

- Member of the program committee, SSVM 2025

Reviewing

- Journals: Journal of Mathematical Imaging and Vision, Inverse Problems, Numerische Mathematik, SIAM Journal on Control and Optimization, Electronic Journal of Statistics
- Conferences: SSVM (2023, 2025)

Dissemination

- Participation to the speed searching event of the European night of researchers 2020
- Contribution to the realization of a radio work for the European night of researchers 2019

Skills

Languages

- French: mother tongue
- English: full professional proficiency (TOEIC 985/990)
- Italian: full professional proficiency
- Spanish: notions

Programming

- Languages: Python (PyTorch, JAX), Julia, Lean (beginner)
- Tools: LaTeX, Git, continuous integration (GitHub Actions)
- OS: Linux, Windows