

Pietro Mesquita Piccione

Résumé

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Work experience

- 2025–2027 **Postdoc**, *University of Gothenburg*, Göteborg, Sweden, Supervisor: David Witt Nyström

Education

- 2022 – 2025 **PhD in Mathematics**, *Institut des mathématiques de Jussieu*, Sorbonne Université, Paris, France
Advisors: Sébastien Boucksom and Tat Dat Tô
- 2021 – 2022 **Master's Degree in Mathematics**, *Institut des mathématiques de Jussieu*, Sorbonne Université, Paris, France
- 2017 – 2021 **Bachelor's degree in Mathematics**, *Universidade de São Paulo*, USP, São Paulo, Brazil
Prize for outstanding performance.

Research projects and grants

- 2022 – 2025 **MathInParis2020**, *Scholarship for a PhD in Paris*, Cofunded by Marie Skłodowska-Curie Actions, Fondation Sciences mathématiques de Paris
- 2021 – 2022 **PGSM Scholarship**, *Scholarship for a Master's degree in Paris*, Fondation Sciences mathématiques de Paris
- 2020 – 2021 **Morse Theory**, *Undergraduate Research Project*, FAPESP
Grant FAPESP 2020/04871-0

Articles

- 2025 **A transcendental non-Archimedean Calabi–Yau Theorem with applications to the cscK problem**, *joint with David Witt Nyström*, preprint, arXiv:2509.09442
Description: We solve the non-Archimedean Monge–Ampère equation for compact Kähler manifolds, generalizing a result of Boucksom–Favre–Jonsson to the transcendental setting. This allows us to derive a valuative criterion for uniform K-stability for models. As a central application, we prove that this stability condition implies the existence of a unique constant scalar curvature Kähler metric.
- 2024 **A non-Archimedean theory of complex spaces and the csc-K problem**, *published*, Advances in Mathematics
Description: In this paper I construct a space of valuations attached to a compact complex manifold, that generalize the Berkovich analytification of a projective variety over \mathbb{C} . As an application I get a sufficient algebraic condition for the existence of constant scalar curvature Kähler metrics on a given Kähler class on a Kähler manifold.

Talks

The non-Archimedean approach of the Yau–Tian–Donaldson conjecture

- 2025 **Workshop on Singular canonical Kähler metrics on compact and non-compact manifolds**, Rényi Institute, Budapest, Hungary
- 2025 **Geometry seminar**, Max Plank Institute for Mathematics in the Sciences, Leipzig, Germany
- 2025 **Complex geometry seminar**, Mathematisches Institut, University of Münster, Munster, Germany
- 2025 **MARGE in Brest: Fibrations and Deformations**, Université de Bretagne Occidentale, Brest, France
- 2025 **Geometry Webinar AmSur /AmSul**, , Webinar
- 2025 **Séminaire de Géométrie complexe**, Université Toulouse III - Paul Sabatier, Toulouse, France
- 2025 **Séminaire Géométries ICJ**, Université Claude Bernard Lyon 1, Lyon, France
- 2025 **Mathematics Seminar**, Aarhus University, Aarhus, Denmark

- 2024 Séminaire de géométrie algébrique de Jussieu, ENS, Paris, France
- 2024 Séminaire systèmes dynamiques et géométrie, Université d'Angers, Angers, France
- 2024 Complex Analysis Seminar, University of Bayreuth, Bayreuth, Germany
- 2024 Geometric Analysis Seminar, BICMR, Beijing, China
- 2024 KASS Seminar, Chalmers University, Gothenburg, Sweden
- 2024 Algebraic Geometry Seminar, University of Glasgow, Scotland
- 2024 Any Complex Geometry Seminar, University of California Berkeley, US
- 2024 Graduate Student Seminar Series, SLMath, Berkeley, US
- 2024 Séminaire des Thésards, IMJ-PRG, Université Paris Cité, France
- 2024 Demi-Journée des doctorant.e.s de l'équipe TGA 2024, IMJ-PRG, Sorbonne Université, France
A counterexample for the periodic orbit conjecture
- 2022 Groupe de Travail : Dynamiques Sauvages, IMJ-PRG, Sorbonne Université, France
- 2022 A5 seminar, Instituto de Matemática e Estatística, Universidade de São Paulo, Brasil
To the general public
- 2021 A Tale of Geometry, S4, Instituto de Matemática e Estatística, Universidade de São Paulo, Brazil
- 2020 Morse Theory in 15 Minutes, Senior Thesis Presentation, Instituto de Matemática e Estatística, Universidade de São Paulo, Brazil
- 2020 Is the Earth flat? A talk about curvature, S4, Instituto de Matemática e Estatística, Universidade de São Paulo, Brazil
- 2020 How to solve any equation, with some conditions, S4, Instituto de Matemática e Estatística, Universidade de São Paulo, Brazil

Professional

Academic Services

- 2025 Participated at the cycle “Un texte, une aventure mathématique”, Lycée international St Germain en Laye, Slides and material
Description: Gave a “pre-talk” at a high school preparing for the talk “Dennis Sullivan, mathématicien des analogies” given by Barbara Schapira. “Un texte, une aventure mathématique” is a joint organization of the Société Mathématique de France and the Bibliothèque nationale de France to expose the general public with the history and problems of current research Mathematics.
- 2021 Organizer of the A5 Group, A student runned academic group, Instituto de Matemática e Estatística, Universidade de São Paulo, Brazil
Over 25 weekly seminars organized
- 2019 Deputy Student Representative in the Mathematics Department Council, Instituto de Matemática e Estatística, Universidade de São Paulo, Brazil
- 2018 Deputy Student Representative in the Mathematics Department Council, Instituto de Matemática e Estatística, Universidade de São Paulo, Brazil

Teaching Assistantships

- 2025 Introduction to Riemann Surfaces, Campus Pierre et Marie Curie, Sorbonne Université, France
- 2024 Topology and Differentiable Calculus I, Campus Pierre et Marie Curie, Sorbonne Université, France
- 2024 Functional Analysis, Campus Pierre et Marie Curie, Sorbonne Université, France
- 2023 Topology and Differentiable Calculus I, Campus Pierre et Marie Curie, Sorbonne Université, France
- 2020 Introduction to Algebraic Topology, Instituto de Matemática e Estatística, Universidade de São Paulo, Brazil
- 2019 Introduction to Analysis, Instituto de Matemática e Estatística, Universidade de São Paulo, Brazil
- 2019 Differentiable functions and series, Instituto de Matemática e Estatística, Universidade de São Paulo, Brazil
- 2018 Calculus II, Escola Politecnica, Universidade de São Paulo, Brazil

Scientific Visits

- 2025 **Simons Semester in Analysis and Geometry on Complex Manifolds, Erdős Center, Budapest, Hungary**
Three months visit to the program.
- 2024 **Special Geometric Structures and Analysis, SLMath, Berkeley**
Two months visit to the program.

Events Organized

- 2022 **MaThematical Days : Paul Erdős, Universidade de São Paulo, São Paulo, Brazil**
- 2021 **MaThematical Days : Emmy Noether, Universidade de São Paulo, São Paulo, Brazil**
- 2021 **MaThematical Days : Élie Cartan, Universidade de São Paulo, São Paulo, Brazil**

Other Writings

- 2025 **Autour de la conjecture de Yau–Tian–Donaldson pour une classe transcendante, PhD Thesis, Sorbonne Université**
- 2022 **L^2 techniques in Complex Geometry, Master Thesis, Sorbonne Université**
- 2021 **Morse Theory, Undergraduate Thesis, Universidade de São Paulo**

Other Info

Related Activities

- 2025 **Reading Seminar on Kähler Ricci Flow, Online**
- 2021 – 2022 **Reading Seminar on Wild Dynamics, Groupe De Travail Dynamiques Sauvages, IMJ-PRG, Sorbonne Université**
- 2021 **Summer IMPA, Differential topology graduate course, IMPA, Rio de Janeiro, Brazil**
Online
- 2020 **Summer IMPA, Functional Analysis graduate course, IMPA, Rio de Janeiro, Brazil**
with financial support
- 2018 **Summer IMPA, Real Analysis, IMPA, Rio de Janeiro, Brazil**
with financial support

Languages

- Portuguese Native Speaker
- Italian Native Speaker
- English Fluent
- Spanish Fluent
- French Fluent
- Catalan Intermediate

Memberships

- 2026 Member at the Société Mathématique de France

Links

- ArXiv https://arxiv.org/a/mesquitapiccione_p_1
- Lattes <http://lattes.cnpq.br/7822745238118143>
- Orcid <https://orcid.org/0000-0002-1626-0726>

References

- Reference I Sébastien Boucksom
- Reference II Tat Dat Tô
- Reference III Tamás Darvas
- Reference IV Ruadhaí Dervan