Pietro Mesquita Piccione

Résumé

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🌐 pietropic.github.io/

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 Sklodowska-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.

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 Erdös**, *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

Talks

$\widehat{K}$-stability on Kähler manifolds

| 2026 | **Workshop on K-stability**, East China Normal University, Shanghai, China |

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

2026	**Geometric analysis seminar**, Westlake University, Hangzhou, China
2026	**Geometry and topology seminar series**, University of Science and Technology of China, Hefei, China
2025	**Séminaire de géométrie**, Centre de mathématiques Laurent-Schwartz, Palaiseau, France
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 conjeture
2022	**Groupe de Travail : Dynamiques Sauvages**, IMJ-PRG, Sorbonne Universite, 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

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