

Salim Tayou, Ph.D.

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RESEARCH INTERESTS

I am an algebraic geometer and number theorist. I study Hodge loci in Algebraic Geometry, and Tate loci in Arithmetic Geometry using methods from Hodge Theory, Shimura Varieties, Arakelov Theory, and Homogeneous Dynamics. Recently, I have been interested in topics in Non-Abelian Hodge Theory.

EMPLOYMENT

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| FALL 2024- | Assistant Professor , Dartmouth College
Hanover, New Hampshire |
| 2020-2024 | Benjamin Peirce Fellow , Harvard University
Cambridge, Massachusetts |
| JANUARY-
July 2021 | Member of the School of Mathematics , Institute for Advanced Study
Princeton, New Jersey |
| FALL 2020 | Postdoctoral Fellow , Centre de Recherches Mathématiques
Montréal, Canada |
| 2019-2020 | Instructor , École Normale Supérieure Ulm
Paris, France |

EDUCATION

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| 2019 | Ph.D in Mathematics , Université Paris-Sud, Orsay
Advisor: François Charles, Professor.
THESIS: <i>On some arithmetic and geometric aspects of orthogonal Shimura varieties.</i> |
| 2015 | Masters in Mathematics , École Normale Supérieure Ulm-Université
Pierre et Marie Curie, Paris
SUMMA CUM LAUDE
Advisor: Gaëtan Chenevier, CNRS Director of Research.
THESIS: <i>Images of certain Galois representations associated to Siegel modular forms of genus 2.</i> |
| 2013 | Bachelors in Mathematics , École Normale Supérieure Ulm |

PUBLICATION LIST

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| JUNE 2024 | The torsion locus of the Ceresa normal function.
With Matt Kerr. Preprint. |
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- MAY 2023 | [On the non-abelian Hodge locus.](#)
With Philip Engel. Preprint.
- MARCH 2023 | [Vanishing of Brauer classes on K3 surfaces under reductions.](#)
With Daveshe Maulik. Preprint.
- JANUARY 2023 | [Mixed Mock Modularity of Special Divisors.](#)
With Philip Engel and François Greer. Preprint.
- MARCH 2022 | [Picard rank jumps for K3 surfaces with bad reduction.](#)
To appear in **Algebra & Number Theory**.
- MARCH 2021 | [Equidistribution of Hodge loci II.](#)
With Nicolas Tholozan. **Compositio Mathematica**, Volume 159, Issue 1, January 2023, pp. 1 - 52.
- SEPTEMBER 2019 | [Exceptional jumps of Picard ranks of K3 surfaces over number fields.](#)
With Ananth Shankar, Arul Shankar and Yunqing Tang. **Forum of Mathematics, Pi**, Volume 10 , 2022 , e21.
- MAY 2018 | [Rational curves on elliptic K3 surfaces.](#)
Mathematical Research Letters, Vol. 27, No. 4 (2020), pp. 1237-1247.
- JANUARY 2018 | [Equidistribution of some Hodge loci.](#)
J. Reine Angew. Math, 762 (2020), pp. 167-194.
- FEBRUARY 2016 | [Image de certaines représentations galoisiennes associées aux formes modulaires de Siegel de genre 2.](#)
Int. J. Number Theory, 13, 1129 (2017)

TEACHING AND ADVISING

Instructor/Lecturer

- 2024 | Teaching Algebraic Number Theory in the Spring, Harvard.
- 2023 | Real Analysis, Harvard (UG, fall, 70 students, oversee 5 CAs).
Number Fields, Harvard (G, fall, 10 students).
- 2022 | Commutative Algebra, Harvard (G, fall, 20 students)
Hodge Theory, Harvard (G, spring, 30 students).
- 2021 | Linear Algebra for non-math majors, Harvard (UG, spring, 300 students).
Commutative Algebra, Harvard (G, fall, 6 students).

Teaching Assistant

- 2019 | TA for Algebraic Topology, ENS Ulm (G, 20 students).
- 2016 | TA for Scilab for second year physics students, Université Paris-Sud.

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| | Taught course of LaTeX for bachelor students in mathematics at Paris-Sud university. |
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| 2015 | TA for Linear Differential Equations, Université Paris-Sud. (UG, for second year students in biochemistry).
TA for Calculus, Université Paris-Sud. (UG, 300 students). |
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Advising and Mentoring

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| 2023 | Supervised an undergraduate student's summer project (Harvard).
Supervised a graduate student's minor thesis (Harvard). |
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| 2020 | Supervision of a senior thesis on the project "Banach-Ruziewicz problem." |
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| 2019 | Member of the jury of a third year defense.
Supervision of the senior thesis of two undergraduate students on "Deformations of Galois representations."
Supervision of the senior thesis of two undergraduate students on "On the class number of quadratic imaginary fields." |
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| 2018 | Supervision of the senior thesis of two undergraduate students on "Representations of integers by positive definite quadratic forms and the Siegel Mass formula." |
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| 2014 | Oral examiner in Mathematics, Lycée Louis-Le-Grand. <i>Gave oral examinations to students preparing for best engineering schools in France.</i> |
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HONORS AND AWARDS

FELLOWSHIPS AND GRANTS

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| 2024-PRESENT | Hassan II Academy of Sciences and Technologies
<i>Corresponding Member</i> |
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| 2023-2026 | NSF Grant DMS-2302388 |
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| 2021-2024 | Benjamin Peirce Fellowship
<i>Cambridge, USA</i> |
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| 2021 | Giorgio and Elena Petronio Fellowship II
<i>Princeton, USA</i> |
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| 2020 | CRM Fellowship
<i>Montréal, Canada</i> |
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| 2016-2019 | PhD grant from École Normale Supérieure Ulm
<i>Paris, France</i> |
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| 2012-2016 | Undergraduate fellowship from École Normale Supérieure Ulm
<i>Paris, France</i> |
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AWARDS

- 2012 | **Entrance contest to École Polytechnique**
Ranked first, international entrance exam.
- 2012 | **Concours National Commun**
Ranked first. Moroccan national exam for entrance to best engineering schools.
Morocco
- 2010 | **International Mathematical Olympiads**
Bronze medal.
Astana, Kazakhstan
- 2010 | **Concours Général des Sciences et Techniques of Morocco**
First prize in mathematics. The Concours Général is the highest competitive contest in Morocco for 12th grade students.
Morocco

INVITATIONS FOR CONFERENCES/SEMINARS/COLLOQUIUMS

- MAY 2024 | **Number Theory Seminar**, Harvard University.
- APRIL 2024 | **Number Theory Seminar**, Boston University.
Friends of Harvard Day, Harvard University.
- MARCH 2024 | **Number Theory Seminar**, The Ohio State University.
- MARCH 2024 | **Algebraic Geometry Seminar**, Purdue University.
- FEBRUARY 2024 | **Simons Collaboration Meeting**, MIT.
- JANUARY 2024 | **Colloquium**, Emory University.
- JANUARY 2024 | **Colloquium**, Rutgers University.
- JANUARY 2024 | **Colloquium**, UNC at Chapel Hill.
- JANUARY 2024 | **Colloquium**, Dartmouth College.
- DECEMBER 2023 | **Monodromy and Its Applications, Conference on the Occasion of Nicholas Katz' 80th Birthday**, Princeton University.
- NOVEMBER 2023 | **Algebraic Geometry: Derived categories, Hodge Theory and Chow Groups**, Bonn, Germany.
- NOVEMBER 2023 | **Algebraic Geometry seminar**, University of Maryland.
- NOVEMBER 2023 | **Number Theory seminar**, Georgia Tech.
- OCTOBER 2023 | **Number Theory seminar**, Northwestern University.
- OCTOBER 2023 | **Number Theory seminar**, University of Chicago.
- OCTOBER 2023 | **Number Theory seminar**, University of Toronto, Canada.
- SEPTEMBER 2023 | **Number Theory seminar**, University of Michigan.
- SEPTEMBER 2023 | **Algebraic Geometry seminar**, University of Stony Brook.
- AUGUST 2023 | **Noether–Lefschetz and Hodge loci**, IMPA, Rio de Janeiro.
- JUNE 2023 | **International seminar on automorphic forms**, Darmstadt, Germany.
- MAY 2023 | **Caltech Number theory seminar**, Caltech, Pasadena.
- MAY 2023 | **Georgia Algebraic Geometry symposium**, Athens, Georgia.
- APRIL 2023 | **Degeneracy of algebraic points**, MSRI, Berkeley.
- NOVEMBER 2022 | **Algebraic Geometry seminar**, University of Washington at Saint-Louis.
- OCTOBER 2022 | **Algebraic and Complex Dynamics seminar**, Beijing/Taipei.
- OCTOBER 2022 | **Finiteness results for special subvarieties: Hodge theory, o-minimality, dynamics**, Como, Italy.
- OCTOBER 2022 | **Geometry and Arithmetic of Hyperkähler Manifolds**, AMS Fall Southeastern Sectional Meeting.
- OCTOBER 2022 | **Number Theory seminar**, UC Berkeley.
- JUNE 2022 | **Algebraic Geometry seminar**, Hannover University.
- MAY 2022 | **Number Theorists seminar**, Harvard University.

- JANUARY 2022 **Algebraic Geometry seminar**, Harvard University.
 DECEMBER 2021 **Algebraic Geometry seminar**, Michigan State University.
 NOVEMBER 2021 **Number Theory seminar**, University of Chicago.
 OCTOBER 2021 **Algebraic Geometry seminar**, UC Santa Barbara.
 SEPTEMBER 2021 **Number Theory seminar**, Harvard University.
 MAY 2021 **Algebraic Geometry seminar**, Humboldt Universität, Berlin.
 APRIL 2021 **Algebraic Geometry seminar**, University of Georgia.
 MARCH 2021 **Number Theory seminar**, Harvard University.
 FEBRUARY 2021 **Number Theory seminar**, IAS/Princeton University, joint.
 JANUARY 2021 **Member's seminar**, Institute for Advanced Study, Princeton.
 DECEMBER 2020 **Essener Oberseminar**, Duisburg-Essen University, Germany.
 OCTOBER 2020 **Geometry and Arithmetic of Hyperkähler Manifolds**, AMS Fall South-eastern Sectional Meeting.
 OCTOBER 2020 **Number Theory seminar**, MIT.
 SEPTEMBER 2020 **Member's seminar**, CRM Montréal.
 SEPTEMBER 2020 **Number Theory seminar**, Québec-Vermont.
 JANUARY 2020 **Séminaire Arithmétique et géométrie algébrique**, IRMA, Strasbourg.
 JANUARY 2020 **Réseau des étudiants en géométrie algébrique**, IHP, Paris.
 JANUARY 2020 **Number Theory seminar**, University of Copenhagen.
 DECEMBER 2019 **Arithmetische und Algebraische Geometrie seminar**, TU, Munich.
 SEPTEMBER 2019 **Séminaire de géométrie complexe**, Institut Élie Cartan, Nancy.
 MAY 2019 **Young Mathematicians Academic Forum**, Hefei, China.
 APRIL 2019 **Séminaire de Géométrie Arithmétique et Motivique**, Université Paris 13.
 JANUARY 2019 **Séminaire "Raconte moi..."**, ENS Paris.
 NOVEMBER 2018 **Algebraic geometry seminar**, Bonn University.
 OCTOBER 2018 **Seminario di geometria algebrica**, Università degli Studi di Milano.
 MARCH 2018 **Séminaire d'Arithmétique et de Géométrie Algébrique**, Paris-Sud University, Orsay.
 FEBRUARY 2018 **Groupes Fondamentaux, Théorie de Hodge et Motifs**, villa Finaly, Florence.
 JANUARY 2018 **Cycles algébriques**, UPMC, Paris.
 SEPTEMBER 2017 **Journée de rentrée de l'équipe d'Algèbre**, ENS Paris.
 JUNE 2017 **Mathjeunes Seminar**, IHÉS, Bures-sur-Yvette.
 MARCH 2017 **Ph.D students seminar**, Université Paris-Sud, Orsay.
 MAY 2016 **Mathjeunes seminar**, Université Pierre et Marie Curie, Paris.

LONG TERM INVITATIONS

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| DECEMBER 2019 | Technische Universität München , invited by Frank Gounelas. |
| NOVEMBER 2019 | Princeton University , invited by Yunqing Tang. |
| NOVEMBER 2018 | Max Planck Institute, Bonn , invited by Daniel Huybrechts. |
| OCTOBER 2018 | Università degli Studi di Milano , invited by Fabrizio Andreatta. |