Ziyang GAO

Curriculum Vitae

Office: MS 6925
520 Portola Plaza, Box 951555
Los Angeles, CA 90095-1555, USA
✉ ziyang.gao@math.ucla.edu
🖥 http://www.math.ucla.edu/~ziyang.gao

───── ## Research Interests

Arithmetic geometry, (mixed) Shimura varieties, Diophantine geometry, families of abelian varieties, rational/integral points, transcendence problems.

───── ## Academic Positions

2024– **Professor**.
UCLA, CA, USA

2021–2024 **Professor**, W3 (highest level in the German system).
Leibniz University Hannover, Germany

2015–2021 **chargé de recherche**, (tenured junior researcher).
CNRS, Institut Mathématiques de Jussieu-Paris Rive Gauche, Paris, France

2016–2018 **Instructor**.
Princeton University, NJ, USA

2015–2016 **Member**.
Institute for Advanced Study (IAS), NJ, USA

───── ## Education

2012–2015 **PhD of Math**, Université Paris-Sud, France and Leiden University, Netherlands.
Supervisors: Emmanuel Ullmo and Bas Edixhoven
Dissertation : The mixed Ax–Lindemann theorem and its applications to the Zilber–Pink conjecture.

2011–2012 **M2 (Master 2) of Math**, Université Paris-Sud, France.

2010–2011 **M1 (Master 1) of Math**, University of Milan, Italy.

2006–2010 **Bachelor of Science, Math**, Peking University, China.

───── ## Awards and Fundings

Spring 2026 Von Neumann Fellowship, IAS.

2025 Compositio Prize for the period 2020–2022.

Awarded every 3 years to a paper published in the journal Compositio Mathematica. For my paper "Generic rank of Betti map and unlikely intersections".

2024   Frontiers Science Award.

2023   ICCM Best Paper Award (International Consortium of Chinese Mathematicians).

2022   David Goss Prize.

Awarded every two years to mathematicians under 35 for outstanding contributions to number theory.

2020   ICCM Best Paper Award (International Consortium of Chinese Mathematicians).

09/2020-   ERC Starting Grant "UnIntUniBd", approx. 1,5 million €. Early termination 09/2024
08/2025   after move to the US.

02/2020-   research funding ANR T-ERC(7) "UniBdPt", approx. 120k €. Early termination in
07/2022   08/2020 after awarded ERC.

2015   Stieltjes Prize.

Dutch mathematical thesis prize.

Publications and Preprints

23   **Hodge cycles and quadratic relations between holomorphic periods on CM abelian varieties** (with E. Ullmo), *Preprint*, 2024.

22   **Heights and periods of algebraic cycles in families** (with S. Zhang), *Preprint*, 2024.

21   **Bigness of the tautological line bundle and degeneracy loci in families of abelian varieties**, *Compte-rendu*, 2024.

20   **Bi-$\overline{\mathbb{Q}}$-structure on Hermitian symmetric spaces and quadratic relations between CM periods** (with E. Ullmo and A. Yafaev), *Preprint*, 2024.

19   **The Relative Manin–Mumford Conjecture** (with P. Habegger), *Preprint*, 2023.

18   **Degeneracy loci in the universal family of abelian varieties** (with P. Habegger), *Journal of Number Theory (JNT Prime)*, vol. 270 (Proceedings of the Second JNT Biennial Conference 2022), p. 96-121, 2025.

doi.org/10.1016/j.jnt.2024.05.015, published online in May 2024

17   **The Uniform Mordell–Lang Conjecture** (with T. Ge and L. Kühne), *Preprint*, 2021.

16   **Recent developments of the Uniform Mordell–Lang Conjecture**, *Survey*, 2021.

15   **The Ax–Schanuel conjecture for variations of mixed Hodge structures** (with B. Klingler), *Math. Annalen*, vol. 388, p. 3847–3895, 2024.

doi.org/10.1007/s00208-023-02614-w, published online in April 2023

14   **A consequence of the relative Bogomolov conjecture** (with V. Dimitrov and P. Habegger), *Journal of Number Theory (JNT Prime)*, vol. 230 (Proceedings of the First JNT Biennial Conference 2019), p. 146–160, 2022.

13   **Uniformity in Mordell–Lang for curves** (with V. Dimitrov and P. Habegger), *Annals of Mathematics*, vol. 194, p. 237–298, 2021.

12 **Uniform bound for the number of rational points on a pencil of curves** (with V. Dimitrov and P. Habegger), *IMRN*, vol. 2021, p. 1138-1159, 2021. doi.org/10.1093/imrn/rnz248, published online in December 2019

11 **Generic rank of Betti map and unlikely intersections**, *Compositio Mathematica*, vol. 156 (12), p. 2469-2509, 2020.

10 **The Geometric Bogomolov Conjecture** (with S. Cantat, P. Habegger and J. Xie), *Duke Mathematical Journal*, vol. 170, p. 247-277, 2021.

9 **Mixed Ax–Schanuel for the universal abelian varieties and some applications**, *Compositio Mathematica*, vol. 156 (11), p. 2263-2297, 2020.

8 **Faltings Heights and L-functions** (with R. von Känel and L. Mocz), in "Arithmetic and Geometry: Ten Years in Alpbach" edited by Gisbert Wüstholz and Clemens Fuchs, *Annals of Mathematics Studies*, vol. 202, Princeton U. Press.

7 Appendix to **The Betti map associated to a section of an abelian scheme** (Y. André, P. Corvaja and U. Zannier), *Inventiones mathematicae*, vol. 222, p. 161-202, 2020.

6 **Heights in families of abelian varieties and the Geometric Bogomolov Conjecture** (with P. Habegger), *Annals of Mathematics*, vol. 189, p. 527-604, 2019.

5 **Panorama on Ax type transcendence results**, *Proceedings of the 7th ICCM*, vol. II, p. 33-52, International Press of Boston, 2019.

4 **Enlarged mixed Shimura varieties, bi-algebraic system and some Ax type transcendental results**, *Forum of Mathematics, Sigma*, vol. 7, 2019, e16.

3 **About the mixed André-Oort conjecture: reduction to a lower bound for the pure case**, *Comptes rendus Mathématique*, vol. 354, p. 659-663, 2016.

2 **A special point problem of André–Pink–Zannier in the universal family of abelian varieties**, *Annali della Scuola Normale Superiore di Pisa, Classe di Scienze*, vol. XVII, p. 231-266, 2017.

1 **Towards the André–Oort conjecture for mixed Shimura varieties : the Ax–Lindemann theorem and lower bounds for Galois orbits of special points**, *Journal für die reine und angewandte Mathematik (Crelle)*, vol. 732, p. 35-146, 2017.

Acdemic Experience

(Selected) Conferences and Colloquium Talks

Nov 2025 Diophantine approximation and transcendence, CIRM, Luminy (France).

Sep 2025 Frontier in Mathematical Sciences, Hong Kong.

Jul 2025 section "Varieties over global fields" of SRI (Algebraic Geometry conference every 10 years), Fort Collins (Colorado, USA).

Jun 2025 Complex Geometry and Beyond (Ngaiming Mok's 70th birthday conference), Shanghai (China).

Apr 2025 Colloquium at University of Minnesota Twin Cities, Minneapolis-Saint Paul (MI, USA).

Sep 2024   Southern California Number Theory Day, Irvine (CA, USA).

Jul 2024   Conference on "Arithmetic Geometry" in Honour of Gerd Faltings' 70th Birthday, Bonn (Germany).

Jul 2024   The 2nd International Congress of Basic Science, Beijing (China).

Jul 2024   The Mordell conjecture 100 years later, Boston (MA, USA).

Dec 2023   2023 Winter Meeting in Algebra and Geometry, Rome (Italy).

Nov 2023   Colloquium at UCLA, Los Angeles (CA, USA).

Nov 2023   Colloquium at University of Winconsin-Madison, Madison (WI, USA).

Aug 2023   Colloquium at University of Singapore, Singapore.

Aug 2023   Recent Developments in Algebraic Geometry, Arithmetic and Dynamics (Part II), Singapore.

Aug 2023   PKU Mathematics Forum (Peking University), Beijing (China).

Apr 2023   Degeneracy of algebraic points, MSRI, Berkeley (CA, USA).

Apr 2023   Frontiers in Mathematics at Duke University, Durham (NC, USA).

Feb 2023   Introductory Workshop: Diophantine Geometry, MSRI, Berkeley (CA, USA).

Sep 2022   Number Theory Days, Lausanne (Switzerland).

Sep 2022   O-minimality and Diophantine Geometry (Jonathan Pila's 60th birthday), Oxford (UK).

Aug 2022   Mordell 2022: 100 years of elliptic curves, Cambridge (UK).

Jul 2022   Second JNT Biennial Conference, Cetraro (Italy).

Jun 2022   Modern Breakthroughs in Diophantine Problems, Banff (Canada), participation online.

May 2022   Simons Symposium on Periods and L-Values of Motive, Simons Foundation, Scotland.

Apr 2022   Diophantische Approximationen (ID 2216), Oberwolfach (Germany).

Mar 2022   Rational Points 2022, Franken-Akademie Schloss Schney (Germany).

Feb 2022   Colloquium at Yale University, New Haven (CT, USA), online.

Dec 2021   3rd Kyoto–Hefei workshop on arithmetic geometry, Kyoto (Japan), participation online.

Sep 2021   Arakelov Geometry (SFB 1085 Higher Invariants - Interactions between Arithmetic Geometry and Global Analysis), Regensburg (Germany).

Aug 2021   Arithmetic of Shimura varieties over global fields, Cetraro (Italy).

June 2021   Recent Developments in Algebraic Geometry, Arithmetic and Dynamics (Part I), Singapore, participation online.

Dec 2020   ICCM (International Consortium of Chinese Mathematicians), *plenary speaker*, Hefei (China), participation online.

Feb 2020   DART (Differential Algebra and Related Topics) X, CUNY (NY, USA).

Sep 2019   Topics in Rational and Integral Points, Basel (Switzerland).

Jul 2019   First JNT Biennial Conference, Cetraro (Italy).

Jul 2019   Journée Gretchen & Barry Mazur, IHÉS (France).

Jan 2019	International Conference on Periods and L-functions (Gisbert Wüstholz's 70th birthday), Sanya (China).
May 2018	Shimura varieties and hyperbolicity of moduli spaces, Montréal (Canada).
May 2018	Diophantine Geometry, CIRM, Luminy (France).
Jul 2017	Specialization Problems in Diophantine Geometry (Umberto Zannier's 60th birthday), Cetraro (Italy).
Feb 2017	Heights and Applications to Unlikely Intersections, Fields Institute (Canada).
Nov 2016	Second Sino-French Conference in Arithmetic Geometry at TSIMF, Sanya (China).
Aug 2016	7th International Congress of Chinese Mathematicians, Beijing (China).
Jun 2016	Arithmetic and Geometry: Ten years in Alpbach, Alpbach (Austria).
May 2016	Hauteurs de Faltings des variétés abéliennes CM, Gronoble (France).
Apr 2016	Diophantische Approximationen (ID 1615), Oberwolfach (Germany).
Jun 2015	Sino-French research institute on arithmetic geometry, Beijing (China).
Jul 2014	Second ERC Research Period on Diophantine Geometry, Cetraro (Italy).
Mar 2014	On Lang and Vojta's conjectures, CIRM, Luminy (France).

Seminar Talks

2025	Stanford, Caltech.
2024	IAS–Princeton joint, Columbia–CUNY–NYU joint, UCLA, Northwestern, UW Seattle, VaNTAGe ; Jussieu Paris ; National University of Singapore, SUSTech (Shenzhen, China).
2023	Number Theory Web Seminar ; Dutch Intercity Number Theory Seminar, Clermont-Ferrand (France).
2022	Boston University, UCLA.
2021	Brown, UCSB ; Chalmers/Gothenburg joint, Göttingen–Hannover joint ; SUSTech (Shenzhen, China).
2020	Harvard, Berkeley ; Bordeaux, Groningen (Netherlands), HUJI-BGU (Isreal), London, Paris Algebraic Cycles, Warwick–Oxford–Reading–Kings joint ; Morningside Center (Beijing, China).
2019	MIT, Columbia ; Cambridge UK, Humboldt Universität zu Berlin, Dortmund (Germany), ENS Lyon, Jussieu Paris ; Peking University (Beijing, China), SUSTech (Shenzhen, China).
2018	IAS–Princeton joint, Columbia–CUNY–NYU joint ; University of Zurich, Humboldt Universität zu Berlin ; University of Hong Kong.
2017	Berkeley, IAS–Princeton joint ; Amsterdam, Leiden ; Fudan University (Shanghai, China).
2016	Columbia–CUNY–NYU joint ; Basel, Clermont-Ferrand (France), IHÉS.
2015	IAS member talk, Northwestern, Rutgers at Newark, University of Connecticut ; Jussieu Paris, SNS Pisa ; Morningside Center (Beijing, China).

2014   Jussieu Paris, Orsay, IHÉS.

References

- **Laura DeMarco**, Harvard University
  demarco@math.harvard.edu
- **Philipp Habegger**, University of Basel (Switzerland)
  philipp.habegger@unibas.ch
- **Thomas Scanlon**, UC Berkeley
  scanlon@math.berkeley.edu
- **Emmanuel Ullmo**, IHES (France)
  ullmo@ihes.fr
- **Shouwu Zhang**, Princeton University
  shouwu@princeton.edu
- **Christine Taylor** (teaching reference), Stanford University
  taylor13@stanford.edu