Cheng Meng | Curriculum Vitae

Yau Mathematical Sciences Center, Tsinghua, Beijing
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Experience

07/2024– : Postdoc, Yau Mathematical Sciences Center, Tsinghua University. Mentor: Yu Qiu

01/2024-05/2024: Postdoc, Simons Laufer Mathematical Sciences Institute (SLMath, formerly MSRI).

08/2016-12/2023: Ph.D in Mathematics, Purdue University University, USA. Advisors: Giulio Caviglia, Linquan Ma

08/2012–07/2016: Bachelor of Science, Tsinghua University, China

Fellowships, Honors and Grants

01/2024-05/2024: Postdoctoral Fellow, SLMath

2022-2023: Abhyankar Award*,$2300, Purdue University

08/2021-08/2022: Ross-Lynn Grant (formerly PRF research grant)**, $31,684, Purdue University

06/2015: S. T. Yau Award Silver Medal, Team Award Silver Medal, Chow Award Silver Medal, Hua Award Bronze Medal, S. T. Yau College Student Mathematics Contests***

08/2012–07/2016: Member of Xuetang Program of Tsinghua University

01/2012: Silver Medal at National Math Olympic, China

Research Interests

Commutative algebra and its interactions with algebraic geometry, homological algebra and representation theory.

Publications and Preprints

[13]: *Uniform bounds in excellent $\mathbb{F}_p$-algebras and applications to semi-continuity* (with Shiji Lyu),arXiv:2503.13846.

[12]: *The F-signature of Determinantal Rings* (with Hang Huang, Suchitra Pande and Yevgeniya Tarasova),arXiv:2609.32955.

[11]: *Hilbert-Kunz multiplicity of quadrics decreases*,arXiv:2606.04346.

[10]: *Asymptotic behavior of modular representations over abelian p-groups*,arXiv:2603.11592.

[9]: *Finiteness and infiniteness of gradings of Noetherian rings*,arXiv:2508.01628.

[8]: *Explicit Stillman bounds for all degrees* (with Giulio Caviglia and Yihui Liang),arXiv:2507.19617.

[7]: *Limits of F-invariants and Riemann-Stieltjes integral*,arXiv:2507.13898.

[6]: *h-function, Hilbert-Kunz density function and Frobenius-Poincaré function* (with Alapan Mukhopadhyay), J. London Math. Soc. 2 (2026), 114:e70696.

[5]: *Asymptotic colengths for families of ideals: an analytic approach* (with Sudipta Das),J. Algebra 701 (2026), 822–889.

[4]: *Strongly Lech-independent ideals and Lech's conjecture*, Trans. Amer. Math. Soc. 379 (2026), 1627-1647.

[3]: *Local cohomology tables of sequentially almost Cohen-Macaulay modules*, J. Algebra 665 (2025), 596–627.

[2]: *Restrictions on Hilbert coefficients give depths of graded domains*, J. Pure Appl. Algebra 229 (2025) 108144.

[1]: *G-graded irreducibility and the index of reducibility*, Comm. Algebra 48 (2020), no. 2, 826–832.

* Abhyankar Award is awarded for outstanding thesis work in the area of Commutative Algebra.

**The Purdue Research Foundation (PRF) Research Grants are one-year awards to assist faculty by providing support for PRF Research Assistant at the Ph.D. level for their effort in the development of new or the continuation of ongoing research projects.

***When the medals were awarded, S.T.Yau College Student Mathematics Contest was open to undergraduates without a college degree from universities of mainland China, Hong Kong and Taiwan. Now it is also open to undergraduates in other countries.

Invited Conference Talks

29/09/2026: *h-function, the Hilbert-Kunz density function and the Frobenius-Poincaré function* and *Analysis in Hilbert-Kunz theory*, Facets of Frobenius derived invariants (Research workshop), EPFL, Lausanne, Switzerland

17/03/2026: *Analysis in Hilbert-Kunz theory,* The Ubiquity of Commutative Algebra, CIRM, Luminy, France

21/11/2024: *h-function of local rings of characteristic p,* The 45th Japan Symposium on Commutative Algebra, RIMS, Kyoto, Japan

18/09/2024: *Lech's conjecture on multiplicities in flat local extensions,* International Workshop on Commutative Algebra and Related Topics, Chern Institute of Mathematics, Tianjin, China

06/01/2024: *h-function of local rings of characteristic p,* Joint Mathematics Meetings, San Francisco, USA

03/11/2023: *h-function of local rings of characteristic p,* Algebra Days, Arizona State University, USA

26/03/2022: *Strongly Lech-independent ideals and Lech's conjecture,* AMS Spring Central Virtual Sectional Meeting, online

19/03/2022: *Strongly Lech-independent ideals and Lech's conjecture,* AMS Spring Eastern Virtual Sectional Meeting, online

Invited Seminar Talks

12/26/2024: *h-function of local rings of characteristic p,* BIMSA AG seminar, BIMSA

15/11/2024: *h-function of local rings of characteristic p,* Commutative Algebra Seminar in Beijing, AMSS

16/02/2024: *h-function of local rings of characteristic p,* COMA seminar at SLMath, SLMath

11/10/2023: *Multiplicities in flat local extensions,* Commutative Algebra seminar, University of Utah

27/10/2023: *Graded structures in commutative algebra,* Commutative Algebra student seminar, Purdue University

25/10/2023: *Properties of h-function and invariants in characteristic p,* Commutative Algebra seminar, Purdue University

11/10/2023: *h-function of local rings of characteristic p,* Algebra seminar at the University of Nebraska-Lincoln, University of Nebraska-Lincoln

09/10/2023: *h-function of local rings of characteristic p,* Algebra seminar at University of Missouri, University of Missouri

11/04/2023: *Decompositions of local cohomology tables,* Auburn Algebra Seminar, Auburn University

10/03/2023: *Multiplicities in flat local extensions,* IIT Bombay Virtual Commutative Algebra Seminar, IIT Bombay, online

25/10/2022: *Multiplicities in flat local extensions,* Algebraic geometry/commutative algebra seminar, University of Notre Dame

15/09/2022: *Multiplicities in flat local extensions,* Virtual CA Seminar at Michigan, University of Michigan, online

20/04/2022: *Strongly Lech-independent ideals and Lech's conjecture,* Commutative Algebra Seminar at UIC, University of Illinois Chicago, online

11/03/2022: *The Hilbert-Kunz multiplicity,* Commutative Algebra Student Seminar, Purdue University

03/03/2022: *Strongly Lech-independent ideals and Lech's conjecture,* UMN CAAG seminar, University of Minnesota Twin Cities, online

04/02/2022: *The Buchsbaum-Eisenbud-Horrocks conjecture,* Commutative Algebra Student Seminar, Purdue University

01/12/2021: *Strongly Lech-independent ideals and Lech's conjecture,* Commutative Algebra Seminar, Purdue University

07/04/2021: *Boij-Söderberg theory and the decomposition of local cohomology tables of modules,* Commutative Algebra Seminar, Purdue University

09/09/2019: *Infinite free resolutions,* Commutative Algebra Student Seminar, Purdue University

24/04/2018: *Monomial resolutions,* Commutative Algebra Student Seminar, Purdue University

Poster Presentations

07/2025: International conference on commutative algebra to the memory of Jürgen Herzog, VIASM, Hanoi

09/2023: Kumunu 2023, University of Missouri

08/2023: BrianFest, University of Nebraska-Lincoln

06/2023: Commutative Algebra and its Interaction with Algebraic Geometry, University of Notre Dame

04/2023: Morgantown Algebra Days, University of West Virginia

06/2019: Commutative Algebra and its Interaction with Algebraic Geometry, University of Notre Dame

02/2019: Southwest Local Algebra Meeting 2019, University of Texas at El Paso

Other conferences attended

04/2023: Syzygies and Regularity, Workshop For Graduate Students, Postdocs, and Young Researchers, University of Illinois Chicago

11/2022: NSF Workshop on matrix factorizations and related topics, University of Notre Dame

Seminars (Co)Organized

Spring 2022: *Commutative Algebra Student Seminar*, Purdue University.

Teaching Experience

Spring 2026: Teaching Assistant, Algebra II given by Prof. Zhiwei Zheng, Tsinghua University

Fall 2025: Teaching Assistant, Algebra I given by Prof. Zhiwei Zheng, Tsinghua University

Spring 2025: Teaching Assistant, Commutative Algebra given by Prof. Xiang He, Tsinghua University (in English)

Fall 2024: Teaching Assistant, Algebra I given by Prof. Chenglong Yu, Tsinghua University

Fall 2023: Recitation Instructor, Multivariate Calculus given by Prof. Kaitlyn Hood. Purdue University

Fall 2019: Recitation Instructor, Analytic Geometry And Calculus I given by Prof. Kenji Matsuki. Purdue University

Professional service

Referee for: Journal of Algebra, Bulletin of the London Mathematical Society, Journal of Pure and Applied Algebra

Reviewer for AMS Mathematical Reviews

Other activities

16/05/2022-27/07/2022: Tutorial instructor of ICTP summer school "Graduate Course on Tight Closure of Ideals and its Applications". Homepage of the summer school