

# Ryosuke Shimada

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## Education

- Doctor, Mathematical Sciences, the University of Tokyo, April 2021-March 2024.  
Thesis: Geometric Structure of Affine Deligne-Lusztig Varieties for  $GL_n$   
Advisor: Yoichi Mieda
- Master, Mathematical Sciences, the University of Tokyo, April 2019-March 2021.  
Thesis: Geometric Structure of Affine Deligne-Lusztig Varieties for  $GL_3$   
Advisor: Yoichi Mieda
- Bachelor, Mathematics, the University of Tokyo, April 2015-March 2019.

## Academic Positions

- Program-Specific Assistant Professor, Hakubi center/Department of Mathematics, Kyoto University, April 2025-present.
- Visiting Scholar, Department of Mathematics, the University of California, Berkeley, April 2025-present (Host: Sug Woo Shin).
- Postdoctoral Fellow, Department of Mathematics, the University of Hong Kong, May 2024-March 2025 (Mentor: Xuhua He).
- Project Researcher, Graduate School of Mathematical Sciences, the University of Tokyo, April 2024-May 2024 (Mentor: Naoki Imai).

## Research Interests

Affine Deligne-Lusztig Varieties, Shimura Varieties, Langlands Program.

## Grants/Fellowships

- JSPS Overseas Research Fellowships, April 2025-March 2027.
- Basic Science Research Projects, the Sumitomo Foundation, November 2024-November 2025.
- JSPS Overseas Challenge Program for Young Researchers, August-November 2023.
- JSPS Research Fellow (DC1), Japan Society for the Promotion of Science (Grant number:

JP21J22427), April 2021-March 2024.

- WINGS-FMSP Course Student, World-leading Innovative Graduate Study for Frontiers of Mathematical Sciences and Physics, October 2019-March 2024.
- Study and Visit Abroad Program (SVAP), the Faculty of Science, the University of Tokyo, January 2019-February 2019.

### Awards

- Dean's Award (Doctoral program), Graduate School of Mathematical Sciences, the University of Tokyo, March 2024.
- Dean's Award (Master's program), Graduate School of Mathematical Sciences, the University of Tokyo, March 2021.

### Scholarships

- The Julius Springer Scholarship, April 2021-March 2024.
- The Daiohs Foundation Scholarship, April 2021-March 2024.
- The Dentsu Scholarship, April 2015-March 2021.

### Academic Visits

- The University of Duisburg-Essen (U. Görtz), August-November 2023.
- The Chinese University of Hong Kong (X. He), June 2023.
- The University of California, Berkeley (S. W. Shin), February 2023.
- The University of Maryland (T. Haines), November 2022.
- The Technical University of Darmstadt (T. Richarz), October 2022.
- The 2022 Summer School on the Langlands program, IHES, July 2022.
- The University of Chicago (K. Kato), January 2019-February 2019.

### Teaching Experiences

- Instructor, *Senior mathematics seminar*, the University of Hong Kong, 2nd Semester 2024-2025.
- TA, *Algebra I/ Exercise in Algebra I*, the University of Tokyo, Spring 2020.
- TA, *Exercise in Linear Algebra*, the University of Tokyo, Autumn 2020.
- TA, *Algebra I/ Exercise in Algebra I*, the University of Tokyo, Spring 2021.
- TA, *Introduction to Mathematical Science*, the University of Tokyo, Autumn 2021.
- TA, Mathematics Help Room, the University of Tokyo, Spring 2022.
- RA, Computer and Network Management Group, the University of Tokyo, August 2021-March 2024.

### Papers

- [1] R. Shimada, On the supersingular locus of the  $GU(2, n-2)$  Shimura variety, arXiv: 2410.05110 (2024), submitted.
- [2] R. Shimada and T. Takamatsu, On the supersingular locus of the Siegel modular variety of genus 3 or 4, arXiv: 2403.19505 (2024), to appear in Ann. Inst. Fourier (Grenoble).
- [3] R. Shimada, Basic loci of positive Coxeter type for  $GL_n$ , arXiv: 2402.13216 (2024), submitted.
- [4] F. Schremmer, R. Shimada and Q. Yu, Affine Deligne-Lusztig Varieties of Positive Coxeter Type, arXiv: 2312.02630 (2023), submitted.
- [5] R. Shimada, ピンホールモデルにおける再構成問題と筋多様体, 数理科学実践研究レター2023, LMSR 2023-13.
- [6] R. Shimada, The Ekedahl-Oort stratification and the semi-module stratification, arXiv:2309.03371 (2023), to appear in Canad. J. Math.
- [7] R. Shimada, Semi-modules and crystal bases via affine Deligne-Lusztig varieties, Adv. Math. 441(2024), Paper no. 109565.
- [8] R. Shimada, On some simple geometric structure of affine Deligne-Lusztig varieties for  $GL_n$ , Manuscripta Math. 173(2024), no.3-4, 977-1001.
- [9] R. Shimada, Geometric structure of affine Deligne-Lusztig varieties for  $GL_3$ , J. Algebra 623 (2023), 86-126.

### Invited Talks in Seminars

- [1] Beyond the Chen-Zhu conjecture, The 2nd MMS Workshop for Young Researchers, Kyoto University, November 21, 2025.
- [2] Shimura varieties and Kashiwara crystal, Combinatorics summer school, Kamenoi Hotel, September 30, 2025.
- [3] Introduction to affine Deligne-Lusztig varieties, YNU Algebra Seminar, Yokohama National University, May 21, 2025.
- [4] On the Chen-Zhu conjecture, Workshop on Affine Deligne-Lusztig varieties and Related topics, SCMS, March 6, 2025.
- [5] On the Supersingular Locus of the  $GU(2, n-2)$  Shimura Variety, Algebraic Number Theory and Related Topics 2024, RIMS, January 9, 2025.
- [6] On the Supersingular Locus of the  $GU(2, n-2)$  Shimura Variety, Workshop on arithmetic geometry, the University of Hong Kong, December 5, 2024.
- [7] On a group-theoretic approach to the supersingular locus of Shimura varieties, Theory and Applications of Supersingular Curves and Supersingular Abelian Varieties II, RIMS,

November 8, 2024.

- [8] Basic loci of positive Coxeter type, the 23<sup>rd</sup> Sendai-Hiroshima Workshop on Number Theory, Tohoku University, July 9, 2024.
- [9] Beyond the cases of Coxeter type, Mathematical Society of Japan Spring Meeting 2024, Osaka Metropolitan University, March 18, 2024.
- [10] Beyond the cases of Coxeter type, Mittagssseminar zur Arithmetik, the University of Münster, November 7, 2023.
- [11] Beyond the cases of Coxeter type, Research Training Group Seminar, the University of Duisburg-Essen, October 26, 2023.
- [12] Crystal bases and affine Deligne-Lusztig varieties, the 22<sup>th</sup> Hiroshima-Sendai Workshop on Number Theory, Hiroshima University, July 14, 2023.
- [13] Crystal bases and affine Deligne-Lusztig varieties, Algebraic Lie Theory and Representation Theory 2023, Tokyo Institute of Technology, May 14, 2023.
- [14] Semi-modules and crystal bases via affine Deligne-Lusztig varieties, the 19<sup>th</sup> Mathematics Conference for Young Researchers, Hokkaido University, March 7, 2023.
- [15] Semi-modules and crystal bases via affine Deligne-Lusztig varieties, Berkeley Number Theory Colloquium, University of California, Berkeley, February 15, 2023.
- [16] Semi-modules and crystal bases via affine Deligne-Lusztig varieties, Lie Groups and Representation Theory Seminar, the University of Maryland, November 16, 2022.
- [17] Semi-modules and crystal bases via affine Deligne-Lusztig varieties, GAUS-Seminar, Technischen Universität Darmstadt, October 20, 2022.
- [18] Semi-modules and crystal bases via affine Deligne-Lusztig varieties, Number Theory Seminar, Hokkaido University, September 21, 2022.
- [19] On some simple geometric structure of affine Deligne-Lusztig varieties for  $GL_n$ , Mathematical Society of Japan Autumn Meeting 2022, Hokkaido University, September 15, 2022.
- [20] On some simple geometric structure of affine Deligne-Lusztig varieties for  $GL_n$ , Number Theory Seminar, Kyoto University, May 27, 2022.
- [21] Geometric structure of affine Deligne-Lusztig varieties for  $GL_3$ , Mathematical Society of Japan Spring Meeting 2022, Saitama University(online), March 31, 2022.
- [22] Geometric structure of affine Deligne-Lusztig varieties, the 18<sup>th</sup> Mathematics Conference for Young Researchers, Hokkaido University (online), March 3, 2022.
- [23] Geometric structure of affine Deligne-Lusztig varieties for  $GL_3$ , the 20<sup>th</sup> Hiroshima-Sendai Workshop on Number Theory, Hiroshima University (online), July 13, 2021.
- [24] Geometric structure of affine Deligne-Lusztig varieties for  $GL_3$ , Number Theory Seminar, the University of Tokyo (online), May 26, 2021.