# Yota Maeda

Department of Mathematics, Faculty of Science, Kyoto University

## Education

Apr 2019- Mar 2023: (expected) Ph.D. course in Mathematics, Kyoto University in Japan, Advisor: Tetsushi Ito.
Apr 2015- Mar 2019: Undergraduate course in Mathematics, Kyoto University in Japan.

## Other Affiliations

Sep 2022 - current: Quantum Computing Center, Keio University, researcher.
Apr 2021 - current: Advanced Research Laboratory, R&D Center, Sony Group Corporation, researcher.

## Research Interests

I study arithmetic geometry, in particular, Shimura varieties, Kodaira dimensions and modular forms. My research focuses on

1. the properties of algebraic cycles on Shimura varieties, and
2. birational classification of modular varieties.

## Grant

Nov 2020 - Mar 2023: Japan Science and Technology Agency, ACT-X: JPMJAX200P (A solution to Kudla's modularity conjecture, a study of Shimura varieties and their applications to the post-quantum cryptography).

## Personal

Japanese: first language
English: basic
Birthdate: March 11, 1997

E-mail address

1. y.maeda.math@gmail.com

2. y.maeda@math.kyoto-u.ac.jp (until March 2023)

Skills

- Programming (C++, Python)
- Research experience on machine learning, cryptography and quantum computing

Academic Stay in Foreign Countries

- November, 2019: University of Toronto
- May and September, 2022: Leibniz University Hannover
- September, 2022: University of Bath

Teaching Experience
2019-2021: Teaching Assistant in Kyoto University

# Work

## 0 Thesis

[0.1] Yota Maeda, "*Birational geometry and compactifications of modular varieties and arithmetic of modular forms*", Ph.D. thesis, Kyoto University (2023, expected).

## 1 Papers (published)

[1.1] Yota Maeda, "*Irregular cusps of ball quotients*", Math. Nachr, 2022 (accepted).

[1.2] Yota Maeda, Yuji Odaka, "*Fano Shimura varieties with mostly branched cusps*", the proceedings of the conference "Birational geometry, Kahler-Einstein metrics and degenerations", 2022 (accepted).

[1.3] Yota Maeda, "*Modularity of special cycles on unitary Shimura varieties over CM-fields*", Acta Arith. 204 (2022), no. 1, 1–18.

[1.4] Yota Maeda, "*The modularity of special cycles on orthogonal Shimura varieties over totally real fields under the Beilinson-Bloch conjecture*", Canad. Math. Bull. 64 (2021), no. 1, 39–53.

## 2 Preprints

[2.1] Klaus, Hulek Yota Maeda, "*Revisiting the moduli space of 8 points on* $\mathbb{P}^1$", arXiv:2211.00052.

[2.2] Yota Maeda, "*Reflective obstructions of unitary modular varieties*", arXiv:2204.01128 (submitted).

[2.3] Yota Maeda, "*Uniruledness of unitary Shimura varieties associated with Hermitian forms of signatures* $(1,3)$, $(1,4)$ *and* $(1,5)$", arXiv:2008.13106 (submitted).

# 3 Proceedings

[3.1] Yota Maeda, "*The Kodaira dimension of modular varieties*", Mathsci freshman seminar (2021).

[3.2] Yota Maeda, "*On the Kodaira dimension of unitary Shimura varieties*", RIMS conference "Automorphic forms, Automorphic representations, Galois representations, and its related topics"Kokyuroku (2021).

[3.3] Yota Maeda, "*Uniruledness of some unitary Shimura varieties*", Kinosaki Algebraic Geometry Symposium, Kyoto University Research Information Repository (2020).

[3.4] Yota Maeda, "*On the modularity of special cycles on Shimura varieties*", Mathsci freshman seminar (2020).

[3.5] Yota Maeda, "*On the modularity of special cycles on orthogonal Shimura varieties*", RIMS conference "Analytic, geometric and $p$-adic aspects of automorphic forms and L-functions" Kokyuroku (2020).

[3.6] Yota Maeda, "*The local Langlands conjecture for $GL_n$*", Mathsci freshman seminar (2019).

# 4 Talks (conferences)

[4.1] "*On the geometry of higher dimensional ball quotients*", 21-st Sendai-Hiroshima Workshop on Number Theory, Tohoku, 2022.

[4.2] "*The volumes of unitary groups and geometry of ball quotients*", Number theory & Automorphic forms Seminar, Osaka, 2022.

[4.3] "*The Hirzebruch-Mumford volume of unitary groups and its application to the geometry of ball quotients*", Research Seminar Number Theory and Arithmetic Geometry (Leibniz University Hannover), 2022.

[4.4] , "*The Hirzebruch-Mumford volume of unitary groups and its application to birational types of ball quotients*", Algebraic Geometry Seminar, Nagoya, 2022.

[4.5] "*Big line bundles on ball quotients*", Sendai modular form mini workshop, Tohoku, 2022.

[4.6] "*Irregular cusps and Kodaira dimension of unitary modular varieties*", Number theory Autumn workshop, Kanazawa, 2021.

[4.7] "*Fano Shimura varieties and special modular forms*", Algebraic Number Theory in Kyushu (Zoom meeting), 2021.

[4.8] "*Fano Shimura varieties with mostly branched cusps*", Friday Tea Time Zoom Seminar (Zoom meeting), 2021.

[4.9] "*The Kodaira dimension of modular varieties*", Mathsci freshman seminar 2021 (Zoom meeting), 2021.

[4.10] "*On the Kodaira dimension of unitary Shimura varieties*", RIMS conference "Automorphic forms, Automorphic representations, Galois representations, and its related topics" (Zoom meeting), 2021.

[4.11] "*On the Kodaira dimension of unitary Shimura varieties*", Hannover algebraic geometry seminar (Zoom meeting), 2020.

[4.12] "*Uniruledness of some unitary Shimura varieties*", Kinosaki Algebraic Geometry Symposium 2020 (Zoom meeting), 2020.

[4.13] "*On the singularities of unitary Shimura varieties and their applications to the Kodaira dimension*", 19-th Hiroshima-Sendai Workshop on Number Theory (Zoom meeting), 2020.

[4.14] "*On the modularity of special cycles on Shimura varieties*", Mathsci freshman seminar 2020, Nagoya 2020.

[4.15] "*On the modularity of special cycles on orthogonal Shimura varieties*", RIMS conference "Analytic, geometric and $p$-adic aspects of automorphic forms and L-functions", Kyoto, 2020.

[4.16] "*On the modularity of the generating series of special cycles on orthogonal Shimura varieties*", Number Theory Seminar, Kyoto, 2019.

[4.17] "*The local Langlands conjecture for* $\mathrm{GL_n}$", Mathsci freshman seminar 2019, Kyoto, 2019.

.

# 5 Talks (others)

[5.1] "*Eichler orders and the Deuring correspondence*", A number thoretic approach for Post-Quantum Cryptography related to Ramanujan graphs, Kyushu, 2021.

[5.2] "*Modular varieties and modular forms〜intersection of number theory and algebraic geometry〜*", Student Colloquium at Kyoto University (Zoom meeting), 2021.