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Membership of academic societies:
MSJ (Mathematical Society of Japan)

Research Interest:

- Algebraic Geometry
- Moduli
- K3 surfaces

Research Summary:

The main problem of algebraic geometry is to study structures and symmetries of algebraic varieties and their moduli spaces. The most interesting example of algebraic varieties is an elliptic curve, whose theory was established in the 19th century, and still is a model of present mathematics, where algebra, geometry and analysis are harmony. The theory of elliptic curves is still interesting, for example, it is applied to the theory of cryptography. A K3 surface is a 2-dimensional analogue of an elliptic curve, which was also found in the 19th century. The name "K3" derives from the initials of three Mathematicians "Kummer, Kähler, Kodaira" and also from the name of the mountain "K2" in the Karakorum. Through the mirror symmetry conjecture, K3 surfaces are interesting to theoretical physics, and there is a mysterious connection between symmetries of K3 surfaces and the Mathieu group, a sporadic finite simple group. Moreover, the theory of periods was established as an analogue of that of elliptic curves. This theory of periods of K3 surfaces matches with the new theory of automorphic forms due to Borcherds. My main problem is the study of symmetries and moduli of K3 surfaces and Calabi-Yau manifolds from a wide angle, not only by algebraic geometry but also by group theory and automorphic forms.

Major Publications:

[1] S. Kondo: Moduli of plane quartics, Göpel invariants and Borcherds products, International Mathematics Research Notices **2011** (2011), no. 12, 2825–2860.

[2] I. Dolgachev, S. Kondo: A supersingular K3 surface in characteristic 2 and the Leech lattice, International Mathematics Research Notices **2003** (2003), no. 1, 1–23.

[3] S. Kondo: The moduli space of Enriques surfaces and Borcherds products, J. Algebraic Geometry **11** (2002), 601-627.

[4] S. Kondo: A complex hyperbolic structure for the moduli space of curves of genus three, J. reine angew. Math. , **525** (2000), 219-232.

[5] S. Kondo: Niemeier lattices, Mathieu groups, and finite groups of symplectic automorphisms of K3 surfaces, Duke Math. J. **92** (1998), 593–603.

[6] S. Kondo: The automorphism group of a generic Jacobian Kummer surface, J. Algebraic Geometry **7** (1998), 589-609.

[7] S. Kondo: The rationality of the moduli space of Enriques surfaces, Compositio Mathematica **91** (1994), 151–173.
[8] S. Kondo: Enriques surfaces with finite automorphism groups, Japan. J. Math. , **12** (1986), 191-282.

Awards and Prizes:

- MSJ Algebra Prize (2012)

Education and Appointments:

1986 Assistant Professor, Tokyo Denki University
1990 Associate Professor, Saitama University
1995 Associate Professor, Nagoya University
2001 Professor, Nagoya University

Message to Prospective Students:

I recommend to study both abstract theory of algebraic geometry and classical examples. For example, please visit the last chapter of the following book by Griffiths-Harris [1]. I have used the books [2], [3], [4] as a text book of my seminar.

[1] P. Griffiths, J. Harris: Principles of Algebraic Geometry.
[2] D. Mumford: Tata Lectures on Theta.
[3] K. Kodaira: Seminar Notes (in Japanese), University of Tokyo.
[4] W. Ebeling: Lattices and Codes.