

## Department of Mathematics

### Research Area : Algebra

(URL : <http://www.math.okayama-u.ac.jp/~yoshino/index.html>, <http://www.math.okayama-u.ac.jp/~hashimoto/hasimoto-e.html>)

**Yuji YOSHINO, Professor**  
**Mitsuyasu HASHIMOTO, Professor**  
**Masao ISHIKAWA, Professor**  
**Katsumi TANAKA, Professor**  
**Takeshi SUZUKI, Associate Professor**  
**Yoshihiro ISHIKAWA, Assistant Professor**

### Research Themes :

- 》 Commutative Algebra, Cohen-Macaulay representation theory [Yoshino]
- 》 Commutative Algebra, Study of ring-theoretic properties of rings of invariants [Hashimoto]
- 》 Mathematical Logic, Groups of finite Morley rank [Tanaka]
- 》 Representation Theory, Algebraic and Enumerative Combinatorics [M. Ishikawa]
- 》 Representation Theory, Algebraic Lie Theory [Suzuki]
- 》 Number Theory, Arithmetic of Automorphic Form [Y. Ishikawa]

### Representative Publication :

- M. Hashimoto,  
*F*-rationality of the ring of modular invariants, *J. Algebra* 484 (2017), 207–223.
- Y. Yoshino,  
Cohen-Macaulay modules over Cohen-Macaulay rings. London Mathematical Society, Lecture Notes Series vol. 146, Cambridge University Press, 1990.
- O. Iyama and Y. Yoshino,  
Mutations in triangulated categories and rigid Cohen-Macaulay modules, *Inventiones Mathematicae*, vol. 172 (2008) no. 1, 117–168.
- M. Ishikawa,  
Minor summation formula and a proof of Stanley's open problem. *Ramanujan J.* 16, 211–234 (2008).
- T. Suzuki and M. Vazirani,  
Tableaux on periodic skew diagrams and irreducible representations of the degenerate double affine Hecke algebras of type A, *Int. Math. Res. Not.* 27 (2005), 1621–1656.
- K. Tanaka,  
Some local properties of  $\omega$ -stable groups, *Archiv for Mathematical Logic*, 27, 45–47 (1988).
- Y. Ishikawa,  
Towards rationality of critical values of the standard L-functions for  $U(2,1)$ , *RIMS Kôkyûroku* 1934, 40-51, RIMS Kyoto, (2015).

### Research Area : Geometry

(URL: <http://www.math.okayama-u.ac.jp/~fujimori/index.html>)

**Kazuyoshi KIYOHARA, Professor**  
**Takeshi TORII, Professor**  
**Shoichi FUJIMORI, Professor**  
**Naoyuki MONDEN, Associate Professor**

### Research Themes:

- 》 Riemannian Geometry, Integrable Geodesic Flow [Kiyohara]
- 》 Algebraic Topology, Stable Homotopy Theory, Generalized Cohomology [Torii]
- 》 Differential Geometry of Submanifolds, Surface Theory [Fujimori]
- 》 Low dimensional topology [Monden]

### Representative Publication :

- Jin-ichi Itoh and Kazuyoshi Kiyohara,  
The Cut Loci on Ellipsoids and Certain Liouville Manifolds, *Asian J. Math.* 14, No. 2 (2010), 257--290.
- Takeshi Torii,  
Comparison of power operations in Morava E-theories, *Homology Homotopy Appl.* 19 (2017), no. 1, 59--87.
- Shoichi Fujimori and Toshihiro Shoda,  
Minimal surfaces with two ends which have the least total absolute curvature, *Pacific Journal of Mathematics*, 282 (2016), 107--144.

## Research Area : Analysis

(URL: <http://www.math.okayama-u.ac.jp/~kawabi/index.html>, <http://www.math.okayama-u.ac.jp/~taniguchi/>)

**Hiroshi KAWABI, Professor**

**Masaharu TANIGUCHI, Professor**

**Yoshihito OSHITA, Associate Professor**

**Seiichiro KUSUOKA, Associate Professor**

**Harunori MONOBE, Associate Professor**

### Research Themes:

- 》 Stochastic Analysis [Kawabi]
- 》 Partial Differential Equation [Taniguchi]
- 》 Nonlinear Partial Differential Equation [Oshita]
- 》 Probability Theory, Stochastic Analysis, Stochastic Differential Equation [Kusuoka]
- 》 Free Boudary Problem, Interface Equation [Monobe]

### Representative Publication :

- S. Ishiwata, H. Kawabi and M. Kotani,  
Long time asymptotics of non-symmetric random walks on crystal lattices, *J. Funct. Anal.* **272** (2017), no. 4, 1553–1624. ata, H. Kawabi and M. Kotani
- Masaharu Taniguchi,  
An (N-1)-dimensional convex compact set gives an N-dimensional traveling front in the Allen–Cahn equation, *SIAM Journal on Mathematical Analysis*, Vol. 47, No. 1 (2015), pp. 455–476.
- Jaeyoung Byeon, Ohsang Kwon and Yoshihito Oshita,  
Standing wave concentrating on compact manifolds for nonlinear Schrödinger equations, *Commun. Pure Appl. Anal.* **14** (2015), no. 3, 825–842.
- S. Kusuoka,  
Hölder continuity and bounds for fundamental solutions to non-divergence form parabolic equations, *Analysis & PDE*, Vol. 8, No. 1 (2015), 1–32.
- M. Iida, H. Monobe, H. Murakawa and H. Ninomiya,  
Vanishing, moving and immovable interfaces in fast reaction limits, *Journal of Differential Equations*, **263** (2017), 2715–2735.

## Research Area : Discrete Mathematics

(URL: URL: <http://www.ems.okayama-u.ac.jp/appl/morimoto/>)

**Masaharu MORIMOTO, Professor**

### Research Themes:

- 》 Geometric Discrete Invariants [Morimoto]
- 》 Transformation Groups on Manifolds [Morimoto]

### Representative Publication :

- M. Morimoto,  
One-fixed-point actions on spheres and Smith sets, *Osaka J. Math.* **53** (2016), no 4, 1003–1013.
- M. Morimoto,  
Tangential representations of one-fixed-point actions on spheres and Smith equivalence, *J. Math. Soc. Japan* **67** (2015), no 1, 195–205.