

Bumsig Kim

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Current Position

Professor, School of Mathematics, Korea Institute for Advanced Study

Nationality: Republic of Korea

Education

- Ph.D. in Mathematics (1996), University of California at Berkeley (Advisor: A. Givental)
- B.S. in Mathematics (1989), Seoul National University, Korea

Professional Activities

- 2003 — Present: Professor, Korea Institute for Advanced Study
- 2001 — 2003: Associate Professor, Pohang University of Science and Technology
- 1999 — 2001: Assistant Professor, Pohang University of Science and Technology
- 1997 — 1999: Visiting Research Assistant Professor, University of California at Davis
- 1996 — 1997: Postdoctoral Fellow, Mittag-Leffler Institute

Honors

- KMS Research Award Oct 2010
- Excellent Scholar Grant 2007
- Young Scientist Award 2003
- Excellent Paper Award 2000 by Department of Science and Technology

- Sloan Doctoral Dissertation Fellowship (1995/1996)
- Korean Government Scholarship (1990.9.1 — 1992.8.30)

Publications

1. *Moduli stacks of stable toric quasimaps*, Advances in Mathematics, Volume 225, Issue 6, 20 December 2010, 3022–3051, with I. Ciocan-Fontanine.
2. *Logarithmic stable maps*, in New developments in algebraic geometry, integrable systems and mirror symmetry (RIMS, Kyoto, 2008), 167–200, Adv. Stud. Pure Math., 59, Math. Soc. Japan, Tokyo, 2010.
3. *A generalization of Fulton-MacPherson configuration spaces*, Selecta Math. (N.S.) 15 (2009), no. 3, 435–443, with F. Sato.
4. *Quantum cohomology of the Grassmannian and alternate Thom-Sabastiani*, Compos. Math. 144 (2008), no. 1, 221–246, with C. Sabbah.
5. *The abelian/nonabelian correspondence and Frobenius manifolds*, Invent. Math. 171 (2008), no. 2, 301–343, with I. Ciocan-Fontanine and C. Sabbah.
6. *Gromov-Witten Invariants for Abelian and Nonabelian Quotients*, J. Algebraic Geom. 17 (2008), no. 2, 275–294, with A. Bertram and I. Ciocan-Fontanine.
7. *Rational curves on blow-ups of projective spaces*, Michigan Mathematical Journal 55 (2007) 335–345, with Yongnam Lee and Kyungho Oh.
8. *Two proofs of a conjecture of Hori and Vafa*, Duke Math. J. 126 (2005), no. 1, 101–136, with A. Bertram and I. Ciocan-Fontanine.
9. *Functoriality in intersection theory and a conjecture of Cox, Katz, and Lee*, Journal of Pure and Applied Algebra 179 (2003) 127–138, with A. Kresch, and T. Pantev.
10. *Equivariant Mirrors and the Virasoro Conjecture for Flag Manifolds*, International Mathematical Research Notices, 2003, no 15, 859–882, with D. Joe.
11. *The Connectedness of the moduli space of maps to homogeneous spaces*, in Symplectic Geometry and Mirror Symmetry: Proceeding of the 4th KIAS Annual International Conference, Editors K. Fukaya, Y.-G. Oh, K. Ono, G. Tian, pp. 187–201, with R. Pandharipande.
12. *One-pointed Gravitational Gromov-Witten Invariants for Grassmannians*, J. Korean Math. Soc. 38 (2001), No. 5, pp. 1061–1068.

13. *Quantum Hyperplane Section Principle for Concave Decomposable Vector Bundles*, J. of Korean Math. Soc., Vol.37 (2000), No. 3 , pp.455–461.
14. *The localization Theorem*, Trends in Mathematics Vol. 2, Dec. 1999, 141–144.
15. *Mirror Symmetry and Toric Degenerations of Partial Flag Manifolds*, Acta Mathematica, Vol.184, 2000 , pp.1–39, with V. Batyrev, I. Ciocan-Fontanine and D. van Straten.
16. *Quantum Hyperplane Section Theorem for Homogeneous Spaces*, Acta Mathematica 183 (1999) 71–99.
17. *Conifold Transitions and Mirror Symmetry for Calabi-Yau Complete Intersections in Grassmannians*, Nuclear Physics **B** 514 [PM] (1998) 640–666, with V. Batyrev, I. Ciocan-Fontanine and D. van Straten.
18. *Quantum Cohomology of Flag Manifolds G/B and Quantum Toda Lattices*, Annals of Mathematics, **149** (1999), 129–148.
19. *Quantum Cohomology at the Mittag-Leffler Institute* Ed. P. Aluffi, Elenco dei volumi della collana “Appunti” pubblicati dall’Anno Accademico, 1997, 52–55.
20. *On Equivariant Quantum Cohomology*, International Mathematics Research Notices, 1996 No 17, 841–851
21. *Quantum Cohomology of Partial Flag Manifolds and a Residue Formula for Their Intersection Pairings*. International Mathematics Research Notices, 1995 No.1, 1–16
22. *Quantum Cohomology of Flag Manifolds and Toda Lattices*. Comm. Math. Phys. **168**, 609–641 (1995), with A. Givental.

Selected International Conference Talks or Lectures

- 6/16-22/2007, Five Lectures “Introduction to Gromov-Witten Theory”, *College on Mirror Symmetry* at the Chern Institute of Mathematics, Nankai University in Tianjin, China
- 8/1-4/2006, *Pacific Rim Complex Geometry Conference*, Hefei, China
- 10/8-13/2005, *Progress in Algebraic Geometry Inspired by Physics*, Canada Banff International Research Station
- Jan/2005, *Periods - around the theory of primitive forms (In Honor of Professor Kyoji Saito on his Sixtieth Birthday)* RIMS, Kyoto, Japan
- Jan/2005, *Workshop in Topological Strings*. Fields Institute, Canada

- 12/18-20/2004, *Differential Geometry in Nagoya 2004*, Nagoya, Japan.
- July/2004, *Korea-Japan Conference on Algebraic Geometry in honor of Professor Igor Dolgachev on his 60th birthday*, KIAS International Conference, Seoul, Korea
- June/2004, *NCTS Workshop in Algebraic Geometry*, National Center for Theoretical Science, Taiwan
- Jan/2004, *Trends in Topology, International Conference*, Inha University, Incheon, Korea
- 6/16-19/2003, Three Lectures on Virasoro Conjecture, *Workshop on Quantum Cohomology*, RIMS, Kyoto, Japan
- 11/26-28/2002, *Korea-Japan Joint Workshop on Algebraic Geometry* KIAS, Seoul, Korea
- 8/14-18/2002, *The sixth international conference on several complex variables*, Several Complex Variables and Complex Geometry, A Satellite Conference to ICM 2002, Gyongju, Korea
- 7/8-19/2002, *Conference on Frobenius manifolds, quantum cohomology, and singularities* Plank Institute in Bonn, Germany
- 1/7-11/2002, *Workshop on Categorical Algebra, Deformation Theory and Field Theory*, Kyoto University, Kyoto, Japan
- 3/26-4/7/2001, *Workshop on Symplectic and Contact Topology, Quantum Cohomology, Symplectic Field Theory and Higher-Dimensional Gauge Theory*, Fields Institute, Toronto, Canada
- 10/20/2000, *Mathematics in the New Millennium*, The Korean Mathematical Society, Seoul, Korea
- 8/14/2000, *Symplectic Geometry and Mirror Symmetry: Proceeding of the 4th KIAS Annual International Conference*, KIAS, Seoul, Korea

Organizations

- Workshop on Algebraic Geometry and Physics, Jun 25, 2007 - Jun 29, 2007
- Workshop on Derived Categories of Coherent Sheaves, May 01, 2006 - May 04, 2006, KIAS
- School on Derived Categories of Coherent Sheaves, April 24 - April 28, 2006, KIAS
- Summer School on Symplectic Topology, July 4 - 8, 2005, Muju

- Korea - Japan Joint Workshop in Mathematics, 2004 (Symplectic Topology and Mathematical Physics), November 1 - 5, 2004, KIAS
- KIAS Workshop on Complex Geometry, Oct. 19-21, 2004, KIAS