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

- B.S. in Mathematics (1989), Seoul National University, Korea

Professional Activities

- 2010.9 — 2012.8: Chair of School of Mathematics, KIAS

- 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

- Korean Math Society 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)

Preprints

1. *Higer genus quasimap wall-crossing for semi-positive targets,* Preprint 2013, with Ionut Ciocan-Fontanine.

2. *Wall-crossings in genus zero quasimap theory and mirror maps,* arXiv:1304.7056, with Ionut Ciocan-Fontanine.

3. *Stable quasimaps to GIT quotients,* arXiv:1106.3724, with Ionut Ciocan-Fontanine and Davesh Maulik.

4. *Stable quasimaps to holomorphic symplectic quotients,* arXiv:1005.4125.

Publications

1. *Wall-crossings for Twisted Quiver Bundles,* International J. of Math. vol. 24, No. 5 (2013)) with Hwayoung Lee.

2. *A compactification of the space of maps from curves,* Trans Amer. Math. Soc. Posted: April 25, 2013, with Andrew Kresch and Yong-Geun Oh.

3. *Stable Quasimaps,* Commun. Korean Math. Soc. 27 (2012), No. 3, 571-581.

4. *Moduli stacks of stable toric quasimaps,* Advances in Mathematics, Volume 225, Issue 6, 20 December 2010, 3022–3051, with I. Ciocan-Fontanine.

5. *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.

6. *A generalization of Fulton-MacPherson configuration spaces,* Selecta Math. (N.S.) 15 (2009), no. 3, 435–443, with F. Sato.

7. *Quantum cohomology of the Grassmannian and alternate Thom-Sabastiani,* Compos. Math. 144 (2008), no. 1, 221–246, with C. Sabbah.

8. *The abelian/nonabelian correspondence and Frobenius manifolds,* Invent. Math. 171 (2008), no. 2, 301–343, with I. Ciocan-Fontanine and C. Sabbah.

9. *Gromov-Witten Invariants for Abelian and Nonabelian Quotients,* J. Algebraic Geom. 17 (2008), no. 2, 275–294, with A. Bertram and I. Ciocan-Fontanine.

10. *Rational curves on blow-ups of projective spaces,* Michigan Mathematical Journal 55 (2007) 335–345, with Yongnam Lee and Kyungho Oh.

11. *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.

12. *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.

13. *Equivariant Mirrors and the Virasoro Conjecture for Flag Manifolds*, International Mathematical Research Notices, 2003, no 15, 859–882, with D. Joe.

14. *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.

15. *One-pointed Gravitational Gromov-Witten Invariants for Grassmannians*, J. Korean Math. Soc. 38 (2001), No. 5, 1061–1068.

16. *Quantum Hyperplane Section Principle for Concavex Decomposable Vector Bundles*, J. of Korean Math. Soc., Vol.37 (2000), No. 3, 455–461.

17. *The localization Theorem*, Trends in Mathematics Vol. 2, Dec. 1999, 141–144.

18. *Mirror Symmetry and Toric Degenerations of Partial Flag Manifolds*, Acta Mathematica, Vol.184, 2000, 1–39, with V. Batyrev, I. Ciocan-Fontanine and D. van Straten.

19. *Quantum Hyperplane Section Theorem for Homogeneous Spaces*, Acta Mathematica 183 (1999) 71–99.

20. *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.

21. *Quantum Cohomology of Flag Manifolds G/B and Quantum Toda Lattices*, Annals of Mathematics, **149** (1999), 129–148.

22. *Quantum Cohomology at the Mittag-Leffler Institute* Ed. P. Aluffi, Elenco dei volumi della collana "Appunti" pubblicati dall'Anno Accademico, 1997, 52–55.

23. *On Equivariant Quantum Cohomology*, International Mathematics Research Notices, 1996 No 17, 841–851.

24. *Quantum Cohomology of Partial Flag Manifolds and a Residue Formula for Their Intersection Pairings.* International Mathematics Research Notices, 1995 No.1, 1–16.

25. *Quantum Cohomology of Flag Manifolds and Toda Lattices.* Comm. Math. Phys. **168**, 609–641 (1995), with A. Givental.

Selected International Conference Talks or Lectures

- July 2013, IAS Program on Gromov-Witten Theory and Quantization, IAS, Hong Kong

- July 2013, Pacific RIM conference on Mathematics, Hokkaido

- June 2013, Inauguration conference, Center for Geometry and Physics, Pohang

- June 2013, PRIMA 2013, Shaghai

- June 2013, Development of Moduli Theory (Mukai Conference), RIMS, Kyoto

- May 2013, Birational Geometry and Geometric Invariant Theory, ESI, Wien

- March 2013, Geometry and Physics of Gauged Linear Sigma Model, Michigan, Ann Arbor

- February 2013, Moduli spaces and Mathematical Physics, CIMAT, Guanajuato, Mexico

- November 2012, Workshop: Geometry of the Vortex Equaitons, Hausdorff Research Institute for Mathematics, Bonn

- August 2012, Mirror Symmetry and Its related topics, Kunming, China

- July 2012, Schubert Calculus, Osaka, Japan

- July 2012, Workshop on moduli and birational geometry, Busan, Korea

- June 2012, Symplectic Geometry and Mathematical Physics, Beijing, China

- April 2012, Tropical Geometry and Cluster Algebras, Jussieu, Paris

- February 2012, International Workshop on Tropical and Quantum Geometries, RIMS, Kyoto

- 10/20/2011, Symplectic Geometry Seminar, Beijing International Center for Mathematical Research

- 10/19/2011, Algebraic Geometry Seminar, Institute of Mathematics of the Chinese Academy of Sciences

- 9/20-22/2011, *KIAS Workshop on Periods and Moduli,* KIAS, Seoul

- 8/30-9/1/2011, *Logarithmic Geometry and Moduli,* Clay Mathematics Institute, Cambridge, USA.

- October 2010, Kinosaki Algebraic Geometry Symposium, Japan

- 8/29-9/3/2010, *Categorical Methods in Geometry and Gauge Theory,* Chern Institute at Tianjin, China

- 8/13-16/2010, *ICM2010 satellite conference on Complex Geometry, Group actions and Moduli spaces,* Hyderabad, India

- 6/28-7/2/2010, *5th Pacific Rim Conference on Mathematics,* Stanford

- 12/16-20/2009, Joint Meetings of Korean Math. Soc and American Math. Soc Plenary Talk at Ewah.

- 12/7-11/2009, *Mirror Symmetry and Gromov-Witten Invariants,* Conference at Univ. of Tokyo.

- 7/6-10/2009, *Workshop on Equivariant Gromov-Witten Theory and Symplectic Vortices* CIRM, Luminy, France

- 6/22-26/2009, *Workshop on Mirror Symmetry, Symplectic Geometry and Related Topics,* MIT

- 5/9/2009, *East Asian Symplectic Conference* Academica Sinica, Taipei, Taiwan

- 2/26/2009, Log Geometry Seminar at MSRI, Berkeley

- 9/2/ 2008, *Exceptional Collections and Degenerations of Varieties,* IPMU, Tokyo

- April 2011, Three lectures on Stable quasimaps at Nogoya University.

- 8/25-29/2008, *Frobenius structures and singularity theory* at Banach Conference center, Poland

- 1/7-11/2008, Kyoto RIMS Conference *New developments in Algebraic Geometry, Integrable Systems and Mirror symmetry*

- 2/8/2008, Algebraic Geometry Seminar at Stanford Univ.

- 2/12/2008, Algebraic Geometry Seminar at Univ of Michigan

- March 2008, Two talks at Algebraic Geometry Seminar at Univ of British Columbia

- 3/18-22/2008, Japan Inst of Physics and Mathematics for Universe *Asian mahtematicians and theoretical physicists*

- April 2008, Algebraic Geometry Seminar at Princeton Univ.

- April 2008, Algebraic Geometry Seminar at Columbia Univ.

- April 2008, Algebraic Geometry Seminar at Caltech

- 6/16-22/2007, Five Lectures "Introduction to Gromov-Witten Theory", *College on Mirror Symmetry* at the Chern Institute of Mathmatics, 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

- SNU/KIAS Topology Winter School, December 19 - 22, 2012 (with J. Park)

- SNU/KIAS Topology Winter School, February 21 - 24, 2012 (with J. Park)

- Summer School on Derived Categories, July 25 - July 29, 2011

- East Asia Symplectic Conference 2011, June 21 - June 25

- Summer School on Mirror Symmetry, June 06 - June 11, 2011

- Winter School on Mirror Symmetry, Jan. 4 - 9, 2010

- International Conference on Mirror Symmetry and Gromov-Witten Theory, Jan. 11 - 15, 2010 (with Fukaya and Y-G. Oh, SNU campus)

- Summer School on Mirror Symmetry, June 21 - 25, 2010 (with C. Li)

- Lectures on Toric Degenerations, Potential Functions, and Gelfand-Cetlin Systems, mini-Workshop, March 2009

- Workshop on Gromov-Witten Theory and Related Topics, June 9 - 13, 2008

- 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