

Curriculum Vitae

Minhyong Kim

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Education

- Department of Mathematics, Seoul National University, B.S. in Mathematics (1985)
- Department of Mathematics, Yale University, Ph.D. in Mathematics (1990)

Employment

Regular:

- Director, International Centre for Mathematical Sciences, Edinburgh (2021-)
- Edmund Whittaker Professor of Mathematical Sciences, Maxwell Institute, University of Edinburgh and Heriot-Watt University (2021-)
- Christopher Zeeman Professor of Algebra, Geometry, and Public Understanding of Mathematics, University of Warwick (2020-)
- Research Professor of Number Theory and Fellow of Merton College, University of Oxford (2011-2020)
- Distinguished Professor, Korea Institute for Advanced Study (2016-)
- Distinguished Professor, Ewha Womans University (2015-2016)
- Yun San Chair Professor, Pohang University of Science and Technology (2010-2012, fall terms)
- Professor of Pure Mathematics, University College London (2007- 2011)
- Professor, Purdue University (2005-2007)
- Professor, Korea Institute for Advanced Study (2001-2002)
- Assistant Professor, Associate Professor, and Professor, University of Arizona (1995-2005)
- Assistant Professor, Columbia University (1993-1995)
- C. L. E. Moore Instructor, Massachusetts Institute of Technology (1990-1993)

Visiting:

- Distinguished Visiting Professor, Seoul National University (2013-2015)
- Visiting Professor, Research Institute for Mathematical Sciences, Kyoto, Japan, (2006)
- Visiting Member, Institut des Hautes Études Scientifiques, France (2003, 2004, 2006, 2009)
- Visiting Member, Max-Planck-Institut für Mathematik, Bonn, Germany (2002, 2005)
- Visiting Professor, University of Illinois at Urbana-Champaign (2004)
- Visiting Professor, Université de Paris-Sud, Orsay, France (2003)
- Visiting Professor, Department of Mathematics, University of Toronto (2002)

Grants and Distinctions

- EPSRC New Horizons Grant, September, 2021-June, 2024
- Engineering and Physical Sciences Research Council (EPSRC) grant 'Symmetries and Correspondences' with four other researchers from Oxford and Nottingham for 2.3M GBP. May, 2015-.
- Ho-Am Prize in Science from the Samsung Foundation (2012).
- EPSRC grant, EP/G024979/1 for 359K GBP: 'Non-commutative fundamental groups in Diophantine geometry,' March, 2009-2013.
- EPSRC grant, 46437: Workshop 'Non-commutative constructions in arithmetic and geometry,' June, 2008.

- Japan Society for the Promotion of Science, Core-to-Core program: ‘New Developments of Arithmetic Geometry, Motive, Galois Theory, and Their Practical Applications,’ Foreign member, April, 2006–March, 2008.
- NSF grant DMS-0500504, 2005–2008: ‘Motivic fundamental groups, multiple polylogarithms, and Diophantine geometry’.
- NSF Infrastructure grant 2003–2006: ‘Southwest Center for Arithmetic Geometry’, Co-PI.
- NSF Infrastructure Grant 1998–2002: ‘Southwest Center for Arithmetic Geometry’, Co-PI.
- NSF grant DMS-9701489, 1997–2001: ‘Effective Diophantine Geometry over Function Fields’.
- NSF grant DMS-9106444, 1991–1993.

Some recent scholarly presentations

Plenary Lectures:

- Arizona Winter School on Arithmetic Geometry (series of 4 lectures), March, 2020
- Einstein Lecture, Christ University and International Center for Theoretical Sciences, Bengaluru, December, 2018
- London Mathematical Society, Midlands Regional Meeting, Leicester, June, 2018.
- Euro-Korean Symposium for the Advancement of Science, CNRS Oleron, France, May, 2016.
- Korea Foundation of Science and Technology Societies, Ultra Programme, March, 2016.
- SIAM conference on applied algebraic geometry, July, 2015.
- Algorithmic Number Theory Symposium XI, August, 2014.
- Bridges Conference on Mathematics, Music, Art, Architecture, Culture, August, 2014.
- Asian Mathematical Conference, July 2013.
- The XII meeting of the Canadian Number Theory Association, 2012.
- McGill University Bellairs Workshop in Number Theory, Barbados, May, 2012.
- Fondation Mathématique Jacques Hadamard, *Cours d’Arithmétique et de Géométrie Algébrique*, Institut des Hautes Études Scientifiques, France, February, 2012.
- Joint meeting of the American Mathematical Society and the Korean Mathematical Society, 2009.
- Workshop on Explicit Methods for Rational Points, Banff International Research Station, Banff, Canada, February, 2007.

Colloquia:

- Centre for Geometry, Topology, and its Applications, University of Southampton, May, 2020
- University of Pennsylvania, March, 2020
- Colloque des Sciences Mathématiques du Québec, March, 2019
- Perimeter Institute, March, 2019
- Columbia University, January, 2019
- University of Notre Dame, December, 2018
- International Center for Theoretical Sciences, Bengaluru, December, 2018
- Mathematics and Physics Colloquium, University of Heidelberg, November, 2017
- Mathematics and Physics Colloquium, University of Amsterdam, May, 2017
- Ben Gurion University, Beersheba, April, 2016.
- University of Edinburgh, February, 2016.
- Pacific Institute for Mathematical Sciences Distinguished Visitor Lectures, Lethbridge, Canada, June, 2014.
- British Mathematical Colloquium, April 2011.
- University of Sheffield, November, 2009.
- University of Leicester, October, 2009.
- University of Lille, November, 2008.
- Kings College, London, March 2008.
- University of Exeter, March, 2008.
- University of Durham, February, 2008.
- University of Leeds, January, 2008.

Conferences:

- Conference on ‘The Unity of Mathematics’ in memory of Michael Atiyah, Isaac Newton Institute, September, 2021.
- Morning Lecture, British Mathematical Colloquium, April, 2021
- Montpellier-Toulouse, joint workshop on arithmetic geometry, November, 2019
- Workshop on Structure and Symmetry, University of Edinburgh, September, 2019
- Simons Symposium on p -adic Hodge theory, May, 2019
- Simons Conference on geometry, moonshine, and strings III, February, 2019
- Gauge Theory Ideas in Number Theory, International Center for Theoretical Sciences, Bengaluru, December, 2018
- Iwasawa theory and related topics, Heidelberg, May, 2018.
- Simons Symposium on periods and L -values of motives, Schloss Elmau, Germany, May, 2018
- Workshop, ‘Towards a new theoretical biology’, University of Pennsylvania, April, 2018
- Paris-Tokyo-Beijing arithmetic geometry seminar, IHES, France, April, 2018
- Simons Conference on geometry, moonshine, and strings II, March, 2018
- London-Paris number theory seminar, November, 2017
- Simons Conference on geometry, moonshine, and strings, September, 2017
- Workshop on physics, geometry, and number theory, Chern Institute, Nankai, China, July, 2017
- Workshop on arithmetic Chern-Simons theory, Leiden, Netherlands, May, 2017
- Simons Symposium on p -adic Hodge theory, Schloss Elmau, Germany, May, 2017
- Workshop on arithmetic aspects of moduli spaces, EPFL Lausanne, February, 2016.
- Workshop on topology and quantum numbers, Seoul National University, January, 2016.
- Workshop on arithmetic and homotopy theory, Imperial College London, September, 2015.
- Conference in memory of Robert Coleman, May, 2015.
- Conference in honour of the 70th birthday of John Coates, Cambridge, March, 2015.
- Workshop on multiple zeta values, modular forms and elliptic motives, Madrid, December, 2014.
- Pacific Northwest Number Theory Conference, Vancouver, May, 2014.
- Conference on Galois representations and arithmetic geometry, in honor of Sir Martin Taylor’s 60th birthday, Bordeaux, July, 2012.
- Workshop on the motivic fundamental group, Lorentz Center, Leiden, April, 2011.
- Research workshop on the conjecture of Birch and Swinnerton-Dyer, Royal Society Kavli Center, April, 2011.
- Seoul-Tokyo conference on arithmetic and algebraic geometry, Korea Institute for Advanced Study, November, 2010.
- ICM Satellite conference on Galois representations, Goa, August, 2010.
- ETH Zuerich and EPF Lausanne Number Theory Days, Zürich, April, 2010.
- Conference on the arithmetic of fundamental groups, Heidelberg, February, 2010
- Conference on algebraic and arithmetic geometry, Essen, February, 2010.
- Durham Symposium on ‘New directions in the model theory of fields,’ Durham, July, 2009.
- Workshop on geometry and arithmetic around Galois theory, Istanbul, June, 2009.
- Workshop on finiteness for motives and motivic cohomology, Regensburg, February, 2009.
- Workshop on Arithmetic Geometry: Diophantine approximation and Arakelov theory, Fields Institute, Toronto, October, 2008.
- Symposium on rational points on curves and higher dimensional varieties, Warwick, June, 2008.
- Workshop on arithmetic geometry, Tata Institute for Fundamental Research, NCBS Conference Centre, Bangalore, India, March, 2008.

Seminars:

- Sydney Mathematical Research Institute, Algebra and Geometry Seminar, December, 2020
- String Theory Seminar, Queen Mary University of London, May 2020
- High Energy Theory Seminar, Institute for Advanced Study, Princeton, April, 2019
- Mathematical Physics Seminar, Perimeter Institute, March, 2019
- Number Theory Seminar, University of Warwick, December, 2018
- Number theory seminar, University of Stockholm, June, 2018.
- Philosophy of physics seminar, University of Oxford, May, 2018
- Logic seminar, University of Oxford, May, 2018
- Quantum field theory seminar, University of Oxford, May, 2018
- Beijing-Paris-Tokyo Number Theory Seminar, IHES, France, April, 2018
- Mathematical physics seminar, University of Heidelberg, November, 2017
- Arithmetic geometry seminar, University of Heidelberg, November, 2017
- Number theory seminar, Hebrew University, April, 2016
- Number theory seminar, University of Warwick, March 2013
- Seminar on quantum groups, non-commutative geometry, and algebraic model theory, Queen Mary University of London, February, 2011
- Number theory seminar, University of Paris VI, November, 2009
- Number theory seminar, University of Cambridge, November, 2008
- Arithmetic geometry seminar, Strasbourg, February, 2008

Some recent professional activity

- Michael Atiyah Fellowship Committee, London Mathematical Society (2021-)
- Scientific Steering Committee (ex officio), Isaac Newton Institute (2021-)
- Member of Selection Panel, Royal Society Dorothy Hodgkin Fellowship (2021)
- Member of Council, London Mathematical Society (2021-)
- Member of selection and evaluation committee, Institute for Basic Science, South Korea, January, 2021-
- Head of Oxford Number Theory Research Group (2012-2020)
- Colloquium convener, Mathematical Institute, University of Oxford (2012-2019)
- Member of prize committee for the Leonard Eisenbud prize in mathematics and physics, American Mathematical Society (2019-2022)
- Organiser of three-year thematic programme on arithmetic geometry and quantum field theory, Korea Institute for Advanced Study (2017-2019)
- Co-organiser (with J. Harvey) of the arithmetic geometry and quantum field theory online seminar (2020-)
- Co-organiser (with Philip Candelas, Xenia de la Ossa, and Sergei Gukov) of International Workshop on arithmetic geometry and quantum field theory, Korea Institute for Advanced Study, August, 2017, 2018, 2019
- Co-editor-in-chief (with Isabelle Gallagher and Katrin Wendland), Monographs in Mathematics, Springer-Nature (2014-)
- Member of editorial board, Tunisian Journal of Mathematics (2018-)
- Member of editorial board, Mathematika (2008-2017)
- Editorial advisor, Bulletin, Journal, and Proceedings of the London Mathematical Society (2013-2014)
- Member of scientific committee, Korean Mathematical Society (2011-2016)
- Member of board, International Centre for Mathematical Sciences, Edinburgh (2014-2019)
- Member of governing body, Merton College, Oxford (2011-2020)
- Member of scientific committee, multi-national conference series on Pan-Asian Number Theory (2011-)
- Co-organizer (with Peter Scholze) of Clay Mathematical Institute Research Workshop on Motives and Automorphic Forms, September, 2015

- Seminar organizer of AMS summer research institute in algebraic geometry, Salt Lake City, Utah, July, 2015
- Member of organizing committee for the International Congress of Mathematicians 2014
- Co-organizer (with Ulrike Tillmann) of Clay Mathematical Institute Workshop on Higher Structures in Topology and Number Theory, April, 2013
- Co-organizer (with Fred Diamond and Payman Kassaei) of the Durham Mathematical Symposium, ‘Automorphic Forms and Galois Representations,’ July, 2011
- Co-organizer (with John Coates, Florian Pop, Mohamed Saidi, and Peter Schneider) of five-month program on ‘Non-abelian fundamental groups in arithmetic geometry,’ Newton Institute for Mathematical Sciences, July-December, 2009
- Co-organizer (with John Coates, Richard Taylor, and Andrew Wiles) of workshop on ‘Non-abelian fundamental groups in arithmetic geometry,’ Newton Institute for Mathematical Sciences, July, 2009
- Co-organizer of London-Paris number theory seminar, 2008–2011
- Co-organizer (with Jean-Benoit Bost and Jean-Marc Fontaine) of Asian-French summer school on algebraic geometry and number theory: Motives and related topics, Institut des Hautes Études Scientifiques, France, July, 2006.

Representative Publications

Journal articles:

- Numerically positive line bundles on arithmetic varieties. *Duke Math. J.* 61 (1990), no. 3, pp. 805–821.
- Small points on constant arithmetic surfaces. *Duke Math. J.* 61 (1990), no. 3, pp. 823–833.
- A Lefschetz trace formula for equivariant cohomology. *Ann. Sci. Ecole Norm. Sup.* 28 (1995), Series 4, no. 6, pp. 669–688.
- Purely inseparable points on curves of higher genus. *Math. Res. Lett.* 4 (1997), no. 5, pp. 663–666.
- ABC inequalities for some moduli spaces of log-general type. *Math. Res. Lett.* 5 (1998), no. 5, pp. 517–522.
- Crystalline sub-representations and Neron models (with S. Marshall). *Math. Res. Lett.* 7, no. 5-6, pp. 605–614 (2000).
- The Picard-Lefschetz formula and a conjecture of Kato (with C. Consani), *Math. Res. Lett.* 9 (2002), no. 5-6, pp. 621–631.
- The Hyodo-Kato theorem for rational homotopy types (with R. Hain). *Math. Res. Lett.* 12 (2005), no. 2-3, pp. 155–169.
- The motivic fundamental group of $\mathbf{P}^1 \setminus \{0, 1, \infty\}$ and the theorem of Siegel. *Invent. Math.* 161 (2005), no. 3, pp. 629–656.
- The l -component of the unipotent Albanese map (with A. Tamagawa). *Mathematische Annalen*, 340 (2008), no. 1, pp. 223–235.
- The unipotent Albanese map and Selmer varieties for curves. *Publ. Res. Inst. Math. Sci.* 45 (2009), no. 1, pp. 89–133. (Proceedings of special semester on arithmetic geometry, Fall, 2006.)
- Massey products for elliptic curves of rank one. *J. Amer. Math. Soc.* 23 (2010), 725–747.
- p -adic L-functions and Selmer varieties associated to elliptic curves with complex multiplication. *Annals of Math.* 172 (2010), no. 1, 751–759.
- Selmer varieties for curves with CM Jacobians (with J. Coates). *Kyoto Journal of Mathematics* (special issue in memory of Nagata), 50 (2010), no. 4, 827–852.

- Tangential localization for Selmer varieties. *Duke Math. J.* 161 (2012), no. 2, 173199.
- A p -adic criterion for good reduction of curves (with Fabrizio Andreatta and Adrian Iovita). *Duke Math. J.* 164 (2015), no. 13, 2597–2642.
- Abelian Arithmetic Chern-Simons Theory and Arithmetic Linking Numbers (with H. Chung, D. Kim, G.Pappas, J. Park, H. Yoo). *International Mathematics Research Notices*, Vol. 2017, pp. 1–29
- A non-abelian conjecture of Tate-Shafarevich type for hyperbolic curves (with Jennifer Balakrishnan, Ishai Dan-Cohen, and Stefan Wewers.). *Mathematische Annalen* October 2018, Volume 372, Issue 1–2, pp 369–428.
- Principal bundles and reciprocity laws in number theory. *Proceedings of the Symposia in Pure Mathematics: Algebraic Geometry: Salt Lake City 2015*. vol. 97, T. de Fernex, B. Hassett, M. Mustata, M. Olsson, M. Popa and R. Thomas (eds.) (2018).
- Arithmetic Chern-Simons theory I. In *Galois covers, Grothendieck-Teichmüller theory and Dessins d’Enfants*, F. Neumann and S. Schroll (eds.), 155-180, Springer Proc. Math. Stat., 330, Springer, Cham, 2020.
- Arithmetic Chern-Simons Theory II. In *p -adic Hodge Theory* Bhargav Bhatt, Martin Olsson (eds.), Springer-Verlag, 2020.

Books:

- Prime Fantasy. (Korean) Banni Publishing, Seoul (2013)
- Father’s Mathematical Journey. (Korean) Eunhaeng-namu Publishing, Seoul (2014).
- On the Learning of Mathematics. (Korean) Eunhaeng-namu Publishing, Seoul (2016).
- The Moment You Need Mathematics, Influential Inc., Seoul (2018).
- The Moment You Need Mathematics Again, Influential Inc., Seoul (2020).
- Mathematics in History and History in Mathematics, Book 21 Publishing, Seoul (2021).