June Huh
Curriculum Vitae

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Education

2014	**Ph.D. in Mathematics**, *University of Michigan, Ann Arbor*. Advisor: Mircea Mustaţǎ
2009	**M.S. in Mathematics**, *Seoul National University*. Advisor: Young-Hoon Kiem
2007	**B.S. in Physics and Astronomy**, *Seoul National University*.

Employment

2017∼	**Visiting Professor**, *Institute for Advanced Study*.
2014∼	**Veblen Fellow**, *Princeton University and Institute for Advanced Study*.
2014∼	**Clay Fellow**, *Clay Mathematics Institute*.

Visiting

2015∼	**KIAS Scholar**, *Korea Institute for Advanced Study*.

Publications

Combinatorial applications of the Hodge-Riemann relations.
Proceedings of the International Congress of Mathematicians 3 (2018), 3079-3098.

Hodge theory for combinatorial geometries, *with Karim Adiprasito and Eric Katz*.
Annals of Mathematics 188 (2018), 381-452.

Tropical geometry of matroids.
Current Developments in Mathematics 2016, 1–46, International Press, 2018.

Enumeration of points, lines, planes, etc., *with Botong Wang*.
Acta Mathematica 218 (2017), 297–317.

A tropical approach to a generalized Hodge conjecture for positive currents, *with Farhad Babaee*.
Duke Mathematical Journal 166 (2017), 2749–2813.

Hodge theory of matroids, *with Karim Adiprasito and Eric Katz*.
Notices of the American Mathematical Society 64 (2017), 26–30.

Lefschetz classes on projective varieties, *with Botong Wang*.
Proceedings of the American Mathematical Society 145 (2017), 4629–4637.

Positivity of Chern classes of Schubert cells and varieties.
Journal of Algebraic Geometry 25 (2016), 177–199.

h**-vectors of matroids and logarithmic concavity**.
Advances in Mathematics 270 (2015), 49–59.

Milnor numbers of projective hypersurfaces with isolated singularities.
Duke Mathematical Journal 163 (2014), 1525–1548

Likelihood Geometry, *with Bernd Sturmfels.*
Combinatorial Algebraic Geometry, 63–117, Lecture Notes in Mathematics 2108, Springer, 2014.

Varieties with maximum likelihood degree one.
Journal of Algebraic Statistics 5 (2014), 1–17.

The maximum likelihood degree of a very affine variety.
Compositio Mathematica 149 (2013), 1245–1266.

Log-concavity of characteristic polynomials and the Bergman fan of matroids, *with Eric Katz.*
Mathematische Annalen 354 (2012), 1103–1116.

Milnor numbers of projective hypersurfaces and the chromatic polynomial of graphs.
Journal of the American Mathematical Society 25 (2012), 907–927.

Preprints

Hodge-Riemann relations for Potts model partition functions, *with Petter Brändén.*
arXiv:1811.01696.

Correlation bounds for fields and matroids, *with Benjamin Schröter and Botong Wang.*
arXiv:1806.02675.

A counterexample to the geometric Chevalley-Warning conjecture.
arXiv:1307.7765.

Correspondences between projective planes.
arXiv:1303.4113.

Honors

New Horizons in Mathematics Prize, Breakthrough Prize Foundation, 2019.

Simons Lectures in Mathematics, Massachusetts Institute of Technology, 2019.

Invited Speaker, International Congress of Mathematicians, Rio de Janeiro, 2018.

Invited Address, American Mathematical Society Meeting, Ohio State University, 2018.

Séminaire Bourbaki Talk by Antoine Chambert-Loir, 2018.
Relations de Hodge-Riemann et matroïdes, d'après Adiprasito, Huh et Katz, n$^{\text{o}}$ 1144, Mars 2018.

AMS Current Events Bulletin Talk by Matt Baker, 2017.
Hodge theory in combinatorics, Bulletin of the American Mathematical Society 55 (2018), 57–80.

Blavatnik Regional Award for Young Scientists, New York Academy of Sciences, 2017.

Compositio Prize Finalist, Foundation Compositio Mathematica, 2016.

Invited Speaker, Current Developments in Mathematics, 2016.

ProQuest Distinguished Dissertation Award, University of Michigan, 2015.

Clay Research Fellowship, Clay Mathematics Institute, 2014.

The Wirt and Mary Cornwell Prize in Mathematics, University of Michigan, 2014.

Sumner Myers Thesis Prize, University of Michigan, 2014.

Harvard Junior Fellowship, Harvard Society of Fellows, 2014, declined.

Miller Research Fellowship, Miller Institute, University of California Berkeley, 2014, declined.

NSF Mathematical Sciences Postdoctoral Research Fellowship, 2014, declined.

Lecture Series

June '20	**Encuentro Colombiano de Combinatoria**. Bogotá, Colombia.
October '19	**Simon Marais Lectures**. University of Sydney
April '19	**Simons Lectures in Mathematics**, Massachusetts Institute of Technology. with Alexander Barvinok.
October '18	**Distinguished Lecture Series**. Stanford University.
June '18	**Combinatorics and Hodge Theory**, Nordfjordeid Summer School. with Petter Brändén and Nicholas Proudfoot.
May '18	**Andrzej Jankowski Memorial Lecture**. Gdańsk University.
September '17	**Instruments of Algebraic Geometry**, Bucharest. with David Eisenbud, Peter Scholze, and Duco van Straten.
November '16	**Current Developments in Mathematics**, Harvard University. with László Babai, Kurt Johansson, Adam Marcus, Nikhil Srivastava, and Xinwen Zhu.
July '16	**Summer School in Combinatorial Algebraic Geometry**, Fields Institute. with Renzo Cavalieri and Milena Hering.
June '16	**Erdős Lectures in Discrete Mathematics and Theoretical Computer Science**. Hebrew University of Jerusalem.
January '16	**Borel Seminar**, Les Diablerets. with Laura Anderson, Alex Fink, Felipe Rincòn, Matteo Varbaro, and Geordie Williamson.
January '16	**Hodge theory in combinatorics**, Georgia Institute of Technology. with Karim Adiprasito and Eric Katz.
August '15	**Positivity in Combinatorial Algebraic Geometry**, University of Oregon. with Federico Ardila, Alex Fink, Eric Katz, Nicholas Proudfoot, and Alexander Woo.

Invited Talks

2018

November	**Number Theory Seminar**. Duke University.
November	**Mathematical Conversations**. Institute for Advanced Study.

October	**Cohomology of Algebraic Varieties**. CIRM, France.
August	**International Congress of Mathematicians**. Rio de Janeiro, Brazil.
April	**Tropical Geometry and Amoebas in Higher Dimension**. KTH Royal Institute of Technology, Sweden.
April	**AGNES 2018: Algebraic Geometry Northeastern Series**. Rutgers University.
April	**Texas Algebraic Geometry Symposium**. Texas A&M University.
March	**Members' Seminar**. Institute for Advanced Study.
March	**Department Colloquium**. Indiana University.
March	**American Mathematical Society Central Sectional Meeting**. Ohio State University.
March	**Algebraic Geometry Seminar**. Princeton University.
February	**Georgia Algebraic Geometry Symposium**. Georgia Institute of Technology.

2017

December	**Department Colloquium**. Rutgers University.
December	**75 Years of Mathematics in Mexico**. Universidad Nacional Autónoma de México, Mexico.
November	**Berlin-Leipzig Seminar on Algebra, Geometry, and Combinatorics**. Freie Universität Berlin, Germany.
October	**Geometric and Topological Combinatorics**. Mathematical Sciences Research Institute.
September	**Algebraic Geometry Seminar**. University of Michigan, Ann Arbor.
July	**Math League**. College of New Jersey.
July	**Department Colloquium**. Korea Institute for Advanced Study, Korea.
July	**Algebraic Geometry Seminar**. Institute for Basic Science, Center for Geometry and Physics, Pohang, Korea.
July	**Algebraic Geometry Seminar**. Pohang University of Science and Technology, Korea.
July	**Discrete Mathematics Seminar**. Korea Advanced Institute of Science and Technology, Korea.
June	**Workshop on Hyperplane Arrangements and Singularities**. Korea Institute for Advanced Study, Korea.
June	**MEGA 2017: Effective Methods in Algebraic Geometry**. Sophia Antipolis University, Nice, France.

June	**Arrangements and beyond: Combinatorics, Geometry, and Topology**. Centro De Giorgi, Pisa, Italy.
May	**Simons Symposia: Nonarchimedean and Tropical Geometry**. Schloss Elmau, Germany.
April	**Discrete Mathematics Seminar**. Princeton University.
March	**Discrete Mathematics Seminar**. Rutgers University.

2016

December	**Asymptotic Phenomena in Local Algebra and Singularity**. Mathematical Research Institute of Oberwolfach, Germany.
December	**11th Belgian-Dutch Algebraic Geometry Day, Compositio Award Ceremony**. Amsterdam, Netherlands.
December	**Mathematical Conversations**. Institute for Advanced Study
November	**Topology and Geometry in a Discrete Setting**. Institute for Computational and Experimental Research in Mathematics, Providence.
November	**Algebraic Geometry Seminar**. Columbia University.
October	**Department Colloquium**. Cornell University.
October	**Convexity in Algebraic Geometry**. Fields Institute, Toronto, Canada.
August	**The First Joint Meeting Brazil-Italy in Mathematics**. Instituto Nacional de Matemática Pura e Aplicada, Rio, Brazil.
August	**Summer Conference on Hyperplane Arrangements**. Hokkaido University, Japan.
June	**Algebraic Geometry Seminar**. Korea Institute for Advanced Study, Korea.
June	**Department Colloquium**. Yonsei University, Korea.
April	**Department Colloquium**. Cornell University.
April	**Department Colloquium**. University of Washington.
April	**Combinatorics Seminar**. University of Washington.
April	**Geometry, Algebra, Singularities, and Combinatorics**. Northeastern University.
April	**Department Colloquium**. Northeastern University.
March	**Workshop on Toric Geometry**. Mathematical Research Institute of Oberwolfach, Germany.
February	**Algebra-Number Theory Seminar**. University of Maryland.

February	**Undergraduate Math Colloquium**.	
	Princeton University.	
January	**Combinatorial Algebra Meets Algebraic Combinatorics**.	
	London, Ontario, Canada.	
January	**Combinatorics Seminar**.	
	Georgia Institute of Technology.	

2015

December	**Biannual Algebraic Tropical Meetings of Brown and Yale**.	
	Yale University.	
December	**Valley Geometry Seminar**.	
	University of Massachusetts Amherst.	
November	**Modern Schubert Calculus**.	
	AMS Fall Eastern Sectional Meeting, Rutgers University.	
November	**Member's Seminar**.	
	Institute for Advanced Study.	
October	**Combinatorial and Experimental Methods in Commutative Algebra**.	
	University of Osnabrück, Germany.	
August	**SIAM Conference on Applied Algebraic Geometry**.	
	National Institute for Mathematical Sciences, Daejeon, Korea.	
August	**Maximum Likelihood Degrees and Critical Points**.	
	National Institute for Mathematical Sciences, Daejeon, Korea.	
August	**Geometry and Topology of Amoebas and Beyond**.	
	National Institute for Mathematical Sciences, Daejeon, Korea.	
July	**Algebraic Geometry Seminar**.	
	Kyoto University, Kyoto, Japan.	
July	**Algebraic Geometry Seminar**.	
	Kyoto University, Kyoto, Japan.	
July	**Computational Geometric Topology in Arrangement Theory**.	
	Institute for Computational and Experimental Research in Mathematics, Providence.	
July	**INdAM Italian-Korean Meeting on Algebraic Geometry**.	
	Cortona, Italy.	
June	**Singular Landscapes**.	
	Centre Paul-Langevin, Aussois, France.	
May	**Women and Mathematics 2015**.	
	Princeton University.	
May	**Harvard/MIT Algebraic Geometry Seminar**.	
	Harvard University.	
May	**Board Meeting**.	
	Institute for Advanced Study.	
April	**Discrete Mathetmatics Seminar**.	
	Rutgers University.	
April	**IMPANGA 2015**.	
	Institute of Mathematics, Polish Academy of Sciences, Będlewo, Poland.	
April	**Department Colloquium**.	
	University of Michigan, Ann Arbor.	

March	**Member's Seminar**. Institute for Advanced Study.
March	**AGNES 2015: Algebraic Geometry Northeastern Series**. Boston College.
February	**Local and Global Invariants of Singularities**. CIRM, Luminy, France.
February	**Computer Science and Discrete Mathematics Seminar**. Institute for Advanced Study.
February	**Simons Symposia: Nonarchimedean and Tropical Geometry**. Puerto Rico.

2014

December	**Algebraic Geometry Seminar**. Stony Brook University.
November	**Department Colloquium**. Rice University.
September	**The Topology of Algebraic Varieties**. Institute for Advanced Study.
June	**FPSAC 2014: Formal Power Series and Algebraic Combinatorics**. DePaul University.
June	**Optimization and Algebraic Geometry**. National Institute for Mathematical Sciences, Daejeon, Korea.
May	**Workshop on Okounkov Bodies and Applications**. Mathematical Research Institute of Oberwolfach, Germany.
May	**Algebraic Geometry Seminar**. Stanford University.
May	**Department Colloquium**. University of California, Berkeley.
April	**Algebraic Geometry Seminar**. University of California, Davis.
April	**Arrangements, Wonderful Compactifications, and Tropicalization**. Banff International Research Station, Canada.
April	**Warwick Symposium on Statistical Mechanics**. University of Warwick, England.
March	**Geometry Seminar**. Texas A&M University.
March	**Combinatorics Seminar**. University of Washington.
March	**Algebraic Geometry Seminar**. Columbia University.
March	**Discrete Mathematics Seminar**. Princeton University.
March	**Algebraic Geometry Seminar**. Princeton University.
January	**Computational Algebraic Statistics: Theories and Applications**. Kyoto, Japan.

January   **Workshop on Combinatorics**.
           Mathematical Research Institute of Oberwolfach, Germany.

2013

November   **Singularity Theory Seminar**.
            Institut de Mathématiques de Luminy, France.
November   **Algebraic Geometry Seminar**.
            École polytechnique fédérale de Lausanne, Switzerland.
November   **Algebraic Geometry Seminar**.
            Freie Universität Berlin, Germany.
November   **Algebraic Geometry Seminar**.
            Goethe Universität Frankfurt am Main, Germany.
November   **Computational Algebraic Geometry Seminar**.
            Max Planck Institute of Mathematics, Germany.
November   **Hyperplane Arrangements and Characteristic Classes**.
            Research Institute for Mathematical Sciences, Kyoto, Japan.
November   **Intercity Number Theory Seminar**.
            Technische Universiteit Eindhoven, Netherlands.
November   **Department Colloquium**.
            Yale University.
October   **Algebraic Geometry Seminar**.
           Università degli Studi di Genova, Italy.
October   **Algebraic Geometry Seminar**.
           Sapienza Università di Rome, Italy.
October   **Algebra, Combinatorics, and Topology Seminar**.
           Università di Pisa, Italy.
September   **Combinatorial Methods in Topology and Algebra**.
            Cortona, Italy.
September   **Tropical aspects in Geometry and Topology**.
            Max Planck Institute of Mathematics, Germany.
August   **Computational Algebraic Geometry Seminar**.
          Max Planck Institute of Mathematics, Germany.
July   **Algebraic Geometry Seminar**.
        Hokkaido University, Japan.
June   **Joint International Meeting of the AMS and the RMS**.
        Alba Iulia, Romania.
June   **Inaugural Conference**.
        Institute for Basic Science, Center for Geometry and Physics, Pohang, Korea.
May   **Algebraic Geometry Seminar**.
       Korea Advanced Institute of Science and Technology, Korea.
May   **Discrete Mathematics Seminar**.
       Korea Advanced Institute of Science and Technology, Korea.
April   **Algebra and Combinatorics Seminar**.
         Georgia Institute of Technology.
March   **Algebra Seminar**.
         Virginia Tech University.

March	**Combinatorics and Optimization Seminar**.
	University of Waterloo, Canada.
March	**Algebraic Geometry Seminar**.
	Korea Advanced Institute of Science and Technology, Korea.
February	**Symposium on Projective Algebraic Varieties and Moduli**.
	Yeosu, Korea.
January	**Tropical Geometry**.
	AMS Joint Mathematics Meetings 2013, San Diego.

Professional Services

Member Selection Committee, Institute for Advanced Study, 2018.

Organizer of *Princeton Algebraic Geometry Seminar*,

with Yuchen Liu, Fall 2016∼Spring 2017.

`http://web.math.princeton.edu/alggeom/public_html/`

Organizer of *Hyperplane Arrangements, Wonderful Compactifications, and Tropicalization*,

with Graham Denham and Alex Suciu, Banff International Research Station, April 2014.

`http://www.birs.ca/events/2014/focussed-research-groups/14frg193/`

Referee for:

Acta Mathematica*

Advances in Mathematics

Algebra and Number Theory*

Algebraic Combinatorics*

Annales scientifiques de l'École normlale supérieure

Annals of Mathematics*

Bulletin Mathématique de la Société des Sciences Mathématiques de Roumanie

Combinatorica*

Compositio Mathematica

Duke Mathematical Journal

European Journal of Combinatorics

International Mathematics Research Notices

Journal of Combinatorial Algebra*

Journal of Combinatorial Theory A

Journal of Combinatorial Theory B

Journal of Graph Theory

Journal of Pure and Applied Algebra

Journal of the American Mathematical Society*

Journal of the European Mathematical Society

Mathematical Proceedings of the Cambridge Philosophical Society*

Mathematical Research Letters

Mathematische Annalen

Michigan Mathematical Journal*

NSA Mathematical Sciences Grant Program

Proceedings of the American Mathematical Society

Proceedings of the Edinburgh Mathematical Society

Séminare Lotharingien Combinatoire

Simons Foundation

(*= quick opinion).

Teaching

Princeton University

Fall 2018   **Senior Thesis Advisor**, *Bill Huang.*

Spring 2018   **Junior Thesis Advisor**, *Bill Huang.*

Spring 2017   **Undergraduate Commutative Algebra**, *Primary Instructor.*

University of Michigan at Ann Arbor

Fall 2012   **Calculus I**, *Primary Instructor.*

Fall 2011   **Mathematics Laboratory**, *Staff.*

University of Illinois at Urbana-Champaign

Spring 2011   **Mathematical World**, *Primary Instructor.*

Fall 2010   **Calculus I**, *Recitation Session Leader*, Instructor: Florin Boca.

Fall 2009   **Calculus I**, *Recitation Session Leader*, Instructor: Christopher Leininger.

Outstanding Teaching Assistant Award, *Seoul National University, 2009.*

Seoul National University

Spring 2009   **Resolution of Singularities**, *Recitation Session Leader*, Instructor: Heisuke Hironaka.

Fall 2008   **Honors Calculus II**, *Recitation Session Leader*, Instructor: Young-Hoon Kiem.

Spring 2008   **Calculus I**, *Recitation Session Leader*, Instructor: In-Kang Kim.

References

Matt Baker, Georgia Institute of Technology, `mbaker@math.gatech.edu`.

William Fulton, University of Michigan, Ann Arbor, `wfulton@umich.edu`.

Allen Knutson, Cornell University, allenk@math.cornell.edu.

Mircea Mustaţă, University of Michigan, Ann Arbor, mmustata@umich.edu.

Bernd Sturmfels, University of California, Berkeley, bernd@math.berkeley.edu.

Angela Kubena, (Teaching) University of Michigan, Ann Arbor, akubena@umich.edu.

Diane Maclagan, (Teaching) Warwick University, D.Maclagan@warwick.ac.uk.