# YOUNGSU KIM

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## Academic Positions

- Assistant Professor, California State University San Bernardino, Aug 2020 – present.
- Visiting Assistant Professor, University of Arkansas, Fayetteville, Aug 2017 – July 2020.
- Visiting Assistant Professor, University of California, Riverside, Sep 2014 – Jun 2017.

## Education

- Ph.D. in Mathematics, Purdue University, Aug 2014, advisor: Professor Bernd Ulrich.
- B.S. in Mathematics, Summa Cum Laude, Korea Advanced Institute of Science and Technology (KAIST), Feb 2006.

## Research Interests

- Commutative Algebra and Algebraic Geometry; MSC 13, 14: Blow-ups and its Related Topics, Linkage, Closure Operations, Multiplicities, Log Canonical Threshold, and Macaulay2 Programming.

## Teaching Awards

- Outstanding Visiting Assistant Professor, Department of Mathematics, University of California, Riverside, 2016-17.
- Excellence in Teaching Award, Department of Mathematics, Purdue University, 2012-13.
- Committee for the Education of Teaching Assistants (CETA) Teaching Award, Purdue University, 2012-13

## Academic Awards

- 2018-2019 University of Arkansas Deans' Office Travel Grant.
- AMS Graduate Student Travel Grants, Fall 2013, Spring 2014.
- Member (Program Associate), MSRI, Spring 2013.
- MSRI Workshop Travel Grants, Fall 2012, Spring 2013.
- Purdue Research Foundation Fellowship, Spring 2010.
- Purdue Research Foundation Summer Fellowships, Summer 2008, 2009.

## Professional Memberships

- Member, American Mathematical Society, 2006–Present.
- Member, Mathematical Association of America, 2021–Present.

## Professional Activities & Services

- Local host of a Mathematical Association of American SoCal/Nevada F2022 sectional meeting at California State University San Bernardino (in-person).

- Faculty Fellow of High-Performance Computing Initiative, from F2021–S2023, California State University San Bernardino.[1]
- Scientific committee for the first CSU Mathematical Conference, F2022.
- Students Grade Appeal Panel, Fall 2021–, California State University San Bernardino.
- Student Aid Panel, Spring 2022–, California State University San Bernardino.
- Department of Mathematics Student Scholarship Committee, Spring 2021–, California State University San Bernardino.
- Department of Mathematics co-webmaster, Fall 2021–, California State University San Bernardino.
- Meetings Coordinator, Mathematical Association of America Socal-Nevada Section, Fall 2021 –.
- Co-organizer of a special session at the AMS Meeting in Georgia Tech., Atlanta, March 2021.
- Teaching assistant for the undergraduate workshop for the Thematic Program in Commutative Algebra and its Interaction with Algebraic Geometry at the University of Notre Dame, May 2019.
- Co-organizer of a special session at the AMS Meeting in Loyola University, Chicago, Oct 2015.
- Referee for Journal of Algebra, Journal of Pure and Applied Algebra, Journal of Algebra and Its Applications, Journal of Commutative Algebra, Proceedings of the AMS, and Honam Math. Journal, PUMP Journal of Undergraduate Research.
- Reviewer for Mathscinet.
- Purdue University, Organizer of the Student Commutative Algebra Seminar, 2010-2012.
- Purdue University, Graduate Students Representative, 2010-2011.
- University of California, Riverside, Recommendation letters for undergraduate students.

# Publications

## In Journals

1. With Lance E. Miller, Wenbo Niu, *Log canonical thresholds of generic links of determinantal varieties*, Proc. Amer. Math. Soc. **149** (2021), 2777–2787.
2. With Vivek Mukundan *Equation defining certain graphs*, Michigan Mathematical Journal **69** (2020) 675–710.
3. With Andy Walker, *A note on non-Noetherian Cohen-Macaulay rings*, Proc. Amer. Math. Soc. **148** (2020), 1031-1042.
4. With Louis J. Ratliff and David Rush *A Note on Itoh (e)-valuation Rings of an Ideal*, Journal of Algebra **498** (2018), 47–70.
5. With Justin Chen, *Graded-irreducible Modules are Irreducible*, Communications in Algebra **45** (2017), 1907-1913.
6. *Quasi-Gorensteinness of Extended Rees Algebras*, Journal of Commutative Algebra **9** (2017), 507–544.
7. With William Heinzer and Matt Toeniskoetter, *Blowing Up Finitely Supported Complete Ideals in a Regular Local Ring*, Journal of Algebra **498** (2016), 364–386.
8. With Aline Hosry and Javid Validashti *On the Equality of Ordinary and Symbolic Powers of Ideals*, Journal of Commutative Algebra **4** (2012), 281–292.

In Preparation/Submitted

9. With Thiago H. Freitas and Victor H. Jorge Pérez *On the study of the top non-vanishing formal local cohomology module*, in progress.
10. With Justin Chen and Jonathan Montaño, *Computing multiplicity sequences* , submitted, arxiv.org/2103.14175.
11. With Jaiung Jun and Matthew Pisano, On Picard groups and Jacobians of directed graphs, arxiv:2302.10327.

## Macaulay2 Packages[2]

- With Justin Chen and Jonathan Montaño, *MultiplicitySequence: A Macaulay2 Package for Computing Invariants Related to multiplicities.*

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[1]https://www.csusb.edu/academic-technologies-innovation/xreal-lab-and-high-performance-computing/high-performance-0

[2]Macaulay2 is a computer algebra software specialized in algebraic geometry and commutative algebra

- *jMultiplicity: A Macaulay2 Package for Computing Invariants Related to j-multiplicites*, `https://sites.google.com/site/jmultiplicity`. This project was expanded and merged into the package "MultiplicitySequence."

# Talks (Academic)

- An invited talk in the REU program, Pomona Research in Mathematics Experience, at Pomona College, Su2022.
- An invited talk in the Claremont Colleges Colloquium Series, Claremont Center for the Mathematical Sciences, S2022.
- Special Sessions at AMS Sectional Meetings, March 2022, Sep. 2020, Apr 2020 (canceled due to COVID-19), Nov 2018 (two talks), Oct 2018, Apr 2016 (two different meetings), Oct 2015, Mar 2015, Oct 2014, Apr 2014, Nov 2013, Oct 2013, Oct 2012.
- An invited talk for the undergraduate research seminar Math and Cookies at the State University of New York, New Paltz, F2021.
- Special Sessions at Korean Mathematical Society, Apr 2021, Oct 2020.
- Contributed Papers Sessions at Joint Mathematics Meetings, Jan 2020.
- Algebra Seminar, Department of Mathematics, Tulane University, New Orleans, Louisiana, Nov 2019.
- Algebra Seminar, Department of Mathematics, Iowa State University, Ames, Iowa, Nov 2019.
- Algebra Seminar, Department of Mathematics, New Mexico State University, Las Cruces, New Mexico, Oct 2019.
- Algebra Seminar, Department of Mathematics Education, Chonnam National University, Gwangju, Korea, Aug 2019.
- Colloquium, Department of Mathematics, University of Ulsan, Ulsan, Korea, Jun 2018, Jan 2018, Sep 2016.
- Algebraic Geometry Seminar, KIAS, Seoul, Korea, Aug 2019, Jun 2018, Dec 2017.
- Algebraic Geometry Seminar, KAIST, Daejeon, Korea, Mar 2018, Sep 2016, Jun 2010.
- Colloquium, Department of Mathematics, Chungnam National University, Daejeon, Korea, Jan 2018.
- Southwest Local Algebra Meeting, Mar 2017.
- Algebraic Geometry Session at Vietnam - Korea workshop on selected topics in Mathematics, Da Nang, Vietnam, Feb 2017.
- Commutative Algebra Seminar, Purdue University, Sep 2016, Oct 2015, Mar 2015, Nov 2013, Apr 2011.
- Colloquium, California State University, San Bernardino, San Bernardino, Feb 2015.
- Commutative Algebra Seminar, University of Utah, Sep 2014.
- Kumunu Jr. 2014, University of Nebraska-Lincoln, Apr 2014.
- Commutative Ring Theory Seminar, University of Illinois at Urbana-Champaign, Urbana-Champaign, Nov 2013, Nov 2012.
- Commutative Algebra Seminar, University of California Riverside, Riverside, Apr 2013.
- Mathematics Research Community (MRC) on Commutative Algebra in Snowbird, Utah, Jun 2010.

# Poster Presentations

- Commutative Algebra and its Interactions with Algebraic Geometry: Tight Closure, Linkage, and Syzygies, University of Michigan, Ann Arbor, Jul 2016.
- Midwest Commutative Algebra and Algebraic Geometry Conference, University of Notre Dame, South Bend, May 2016.
- Southwest Local Algebra Meeting, Feb 2016, Feb 2015, Mar 2011.
- Midwest Commutative Algebra Conference, Purdue University, West Lafayette, May 2015.
- Midwest Commutative Algebra and Geometry Conference, Purdue University, West Lafayette, May 2011.

# Teaching Experiences[3]

## California State University San Bernardino

All, but 6000 level, classes are around 25-30 students. 6000 level courses are around 5-15 students, course catalogue.[4].

| | |
|---|---|
| MATH 6110 Topics in Mathematics; Introduction to Toric Varieties | S2023 |
| MATH 5510 Topics in Advanced Mathematics; Bridge to PhD Program | F2022 |
| MATH 6000 Communicating Mathematics | F2022 |
| MATH 6016 Graduate Algebra | S2022 |
| MATH 2220 Calculus II (two sections) | F2021 |
| MATH 5550 Introduction to Topology | F2021 |
| MATH 2210 Calculus I Lab | S2021 |
| MATH 4600 Theory of Rings and Fields | S2021 |
| MATH 6016 Graduate Algebra | S2021 |
| MATH 2210 Calculus I | F2020 |
| MATH 2210 Calculus I Lab | F2020 |
| MATH 4600 Theory of Rings and Fields | F2020 |

## University of Arkansas, Fayetteville

All classes are between 55 to 70 students.

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|---|---|
| MATH2564 Calculus II (two sections) | F2019 |
| MATH2584C Elementary Differential Equations (two sections) | S2018, S2019, F2018 |
| MATH2043 Survey of Calculus (two sections) | F2017 |

## University of California, Riverside

All classes were large lectures, between 80 to 230 students, with a number of teaching assistants.

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|---|---|
| MATH 9C First Year Calculus III (two sections) | S2017 |
| MATH 6B Introduction to College Math for Science (Pre-calculus) | W2017 |
| MATH 9C First Year Calculus III | F2016 |
| MATH 120 Optimization Techniques | F2016 |
| MATH 9C First Year Calculus III | S2016 |
| MATH 120 Optimization Techniques | S2016 |
| MATH 022 Calculus for Business | W2016 |
| MATH 031 Applied Linear Algebra | W2016 |
| MATH 9C First Year Calculus III (two sections) | F2015 |
| MATH 9B First Year Calculus II | S2015 |
| MATH 131 Linear Algebra (proof based course) | S2015 |
| MATH 9A First Year Calculus (two sections) | W2015 |
| MATH 8B Introduction to College Mathematics for Science | F2014 |
| MATH 10A Calculus of Several Variables I | F2014 |

## Purdue University

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[3]S = Spring, Su = Summer, F = Fall, W = Winter
[4]https://catalog.csusb.edu/coursesaz/math/

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|---|---|---|
| MA266, Ordinary Differential Equations | Instructor | Su2013 |
| MA22400, Introductory Analysis II (Business Calculus) | Instructor | F2011, S2012 |
| MA15300, Algebra and Trigonometry I (College Algebra) | Instructor | F2007, F2008, S2010 |
| MA162, Plane Analytic Geometry and Calculus II | Instructor | Su2008 |
| MA59800, Algebra Qualifying Exam Problem Session | Instructor | Su2011, Su2012 |
| MA59800, Abstract Algebra (Graduate Algebra Course) | Recitation instructor | F2012, F2013 |
| MA16200, Plane Analytic Geometry And Calculus II | Recitation instructor | S2009 |
| MA166, Analytic Geometry And Calculus II | Recitation instructor | S2008 |
| MA161, Plane Analytic Geometry And Calculus I | Recitation instructor | S2007 |
| MA261, Multivariate Calculus | Recitation instructor | F2006 |

# Teaching Conferences and Workshops

- Introduction to Teaching Online using Quality Learning and Teaching, certificate, Summer 2020.
- AMS Assessment in Mathematics, June 2020, online, Zoom.
- Mastery Grading Conference, June 2020, online, Zoom.