

Courtney R. Gibbons

Curriculum Vitæ

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EMPLOYMENT

Associate Professor , Department of Mathematics and Statistics, Hamilton College	JUL 2019-PRESENT
Adjunct Professor , Mohawk Correctional Campus, Herkimer College	SU 2019
Assistant Professor , Department of Mathematics, Hamilton College	JUL 2013-2019
Paraprofessional , Department of Math and Computer Science, The Colorado College	AY 2006-07

EDUCATION

Ph.D. Mathematics , University of Nebraska–Lincoln Thesis Advisors: Luchezar L. Avramov and Roger Wiegand Thesis Title: <i>Decompositions of Betti Diagrams</i>	AUG 2013
M.S. Mathematics , University of Nebraska–Lincoln	MAY 2009
B.A. Mathematics , The Colorado College; <i>Summa Cum Laude</i> with Distinction in Mathematics	MAY 2006

RESEARCH INTERESTS

Commutative algebra: properties of infinite free resolutions and factorization in semigroups;
Algebraic statistics: toric varieties of maximum likelihood equations.

PROFESSIONAL MEMBERSHIPS AND HONOR SOCIETIES

American Association of University Professors (AAUP), Association for Women in Mathematics (AWM), Mathematics Association of America (MAA), Society for Industrial and Applied Mathematics (SIAM), National Association of Mathematicians (NAM), Golden Key Honor Society, Phi Beta Kappa (Φ BK)

RESEARCH

(* indicates an undergraduate coauthor)

Published and Accepted Work

Article. *Realizable divisor sequences for atoms in Krull monoids*, with N. Baeth, T. Bell, and J. Striuli (To Appear, J. Commut. Algebra). Preprint: [arXiv:1911.03566](https://arxiv.org/abs/1911.03566)

Article. *Nearly complete intersection hypergraphs*, with C. Bondi*, Y. Ke*, S. Martin*, S. Pothagoni*, and A. Stelzer* (Springer AWM Volume for Women in Commutative Algebra). Preprint: [arXiv:2101.08401](https://arxiv.org/abs/2101.08401)

Article. *L-dimension for modules over a local ring*, with D. Jorgensen and J. Striuli (American Mathematical Society Monographs, Commutative Algebra: 150 years with Roger and Sylvia Wiegand).

Article. *Recursive strategy for decomposing Betti tables of complete intersections*, with R. Huben* and B. Stone. Internat. J. Algebra Comput. 29 (2019), no. 7, 1165–1191. [MR4022702](https://doi.org/10.1112/S10747480195002702)

Article. *Maximum likelihood degree of toric varieties*, with C. Améndola, N. Bliss, I. Burke, M. Helmer, S. Hoşten, E. Nash, J. Rodriguez, D. Smolkin. J. Symbolic Comput. 92 (2019), 222–224. [MR3907355](https://doi.org/10.1016/j.jsc.2019.04.005)

Article. *Rational combinations of Betti diagrams of complete intersections*, with M. Annunziata*, C. Hawkins*, and A. Sutherland*. J. Algebra Appl. 17 (2018), no. 5. [MR3795374](https://doi.org/10.1142/S1741299518500374)

Article. *Critical Pebbling Numbers of Graphs*, with J. D. Laison and E. J. Paul. J. Combin. Math. Combin. Comput. 99 (2016), 199–224. [MR3585742](https://doi.org/10.1112/jlms.12142)

Code. *BoijSoederberg.m2*, package reviser with B. Stone; incorporated in Macaulay2-v1.8.2, April 13, 2015.

Article. *Grandma Makes Granola*, with R. Bedient. *College Math. J.* 46 (2015), no. 1, pp. 58-60.

Article. *Non-simplicial decompositions of Betti diagrams of complete intersections*, with J. Jeffries, S. Mayes, C. Raicu, B. Stone, and B. White. *J. Commut. Algebra* 7 (2015), no. 2, 189–206. [MR3370483](#)

Thesis. *Decompositions of Betti diagrams*. ProQuest LLC, Ann Arbor, MI, 2013. Thesis (Ph.D.); University of Nebraska–Lincoln.

Article. *The cone of Betti diagrams over a hypersurface ring of low embedding dimension*, with C. Berkesch, J. Burke, and D. Erman. *J. Pure Appl. Algebra* 216 (2012), no. 10, 2256–2268. [MR2925819](#)

Article. *Fixing numbers of graphs and groups*, with J. D. Laison. *Electron. J. Combin.* 16 (2009), no. 1, Research Paper 39, 13 pp. [MR2491641](#)

Conference Talks

(† indicates an invited talk; * indicates an upcoming talk)

1176th AMS Meeting Special Session on Combinatorial Methods in Commutative Algebra †* MAR 2022
Tufts University, Medford, MA (Online)

Applications of Tensor Products of Semigroups

1167th AMS Meeting Special Session on Commutative Algebra † MAY 2021

San Francisco, CA (Online)

A Hyper graph Characterization of Nearly Complete Intersections

1150th AMS Meeting Special Session on Commutative Algebra:
in Celebration of the 150th Birthday of Roger and Sylvia Wiegand † SEP 2019

University of Wisconsin-Madison, Madison, WI

Realizing Divisor Sequences in Krull Monoids

MathFest: Commutative Algebra Special Session † AUG 2019

Cincinnati, OH

Szyzygy - When Submodules Align

Joint Mathematics Meetings (JMM): Special Session on Commutative Ring Theory:
Research for Undergraduate and Early Graduate Students Special Session † JAN 2019

Baltimore, MD

Boij-Söderberg theory as an introduction to research in commutative algebra

Route 81 Conference SEP 2018

Syracuse University, Syracuse, NY

Recursive strategy for decomposing Betti diagrams of complete intersections

SIAM Applied Algebraic Geometry Meeting: Maximum Likelihood Degree Minisymposium † AUG 2017

Georgia Institute of Technology, Atlanta, GA

Maximum Likelihood Degrees for Discrete Random Models

Second International Workshop and Conference on Commutative Algebra † OCT 2016

Tribhuvan University, Kathmandu, Nepal

Preparatory Workshop Talk: *Graded Rings, Graded Modules, and Numerical Invariants*

Research Conference Talk: *Short Gorenstein Rings: Numerics and Consequences*

Joint Mathematics Meetings (JMM): Commutative Algebra Special Session † JAN 2016

Seattle, WA

A ring without a Boij-Söderberg theory

MathFest: Concrete Computations in Algebra and Algebraic Geometry Invited Paper Session † AUG 2015

Washington, DC

The search for indecomposable modules

1092nd AMS Meeting Special Session on Commutative Algebra † OCT 2013

University of Louisville, Louisville, KY

Non-simplicial decompositions of Betti diagrams of complete intersections

1085th AMS Meeting Special Session on Commutative Algebra † OCT 2012

University of Arizona, Tucson, AZ

Modules over short Gorenstein rings

JMM: AMS Contributed Papers Session

JAN 2013

San Diego, CA

Modules over short Gorenstein rings

1074th AMS Meeting: Special session on Commutative Algebra †

OCT 2011

University of Nebraska–Lincoln, Lincoln, NE

New directions in Boij–Söderberg theory

Research Seminar Talks

CIMAT

NOV 2021

Descomposiciones de Boij-Soederberg de intersecciones completas

University of Nebraska–Lincoln, Commutative Algebra Seminar

A Ring without a Boij–Söderberg Theory

FEB 2017

Boij–Söderberg Theory I: Betti diagrams over polynomial rings

SEP 2010

Boij–Söderberg Theory II: Betti diagrams over $k[x, y]/(x^2)$

SEP 2010

Williams College, Faculty Research Seminar

NOV 2016

Representations of Kronecker Quivers

Syracuse University, Algebra Seminar

MAR 2015

Parametrizing a family of indecomposable modules

University of Utah, Algebra Seminar

MAR 2012

Decomposition of Betti diagrams over a quadric hypersurface

University of Texas at Arlington, Algebra Seminar

MAR 2012

Betti diagrams over a small hypersurface

University of Nebraska–Lincoln, Commutative Algebra Reading Seminar

2008-13

University of Nebraska–Lincoln, Graduate Student Seminar

2008-12

Posters

JMM: AWM Workshop poster session

JAN 2013

JMM: Undergraduate research poster session

JAN 2007

Selected Workshops, Conferences, and Summer Schools

Institute for Advanced Study: Park City Mathematics Institute, Park City, UT

Undergraduate Faculty Program

JUL 2018

Banff International Research Station, Banff, Alberta, CA

New Trends in Syzygies

JUN 2018

Georgia Institute of Technology

Applied Macaulay2 Tutorial

JUL 2017

American Mathematical Society: Mathematics Research Community

Algebraic Statistics

JUL 2016

Commutative Algebra

JUL 2010

Mathematical Sciences Research Institute

Macaulay2 Workshop

JAN 2014

Joint Introductory Workshop: Cluster Algebras and Commutative Algebra

AUG 2012

Summer Graduate School on Commutative Algebra

JUN 2011

The Colorado College

Macaulay2 Workshop

AUG 2010

The Abdus Salam International Center for Theoretic Physics, Trieste, Italy

School on Commutative Algebra and Interactions with Algebraic Geometry and Combinatorics

SU 2010

TEACHING

Professional Teaching Experience

Research Supervisor

Clemson University
[COURAGE Research Experience for Undergraduates](#)
 Willamette University
[WVMC Research Experience for Undergraduates](#)
 Hamilton College
 Physics, Mathematics, and Music [with K. Brown]
 DEAN 500 Senior Fellowship

Instructor of Record

Hamilton College

MATH 113 Calculus I
 MATH 116 Calculus II
 MATH 224W Linear Algebra
 MATH 325W Modern Algebra
 MATH 327 Cryptography
 MATH 361 Number Theory with Applications
 MATH 450 Independent Study
 MATH 498 Mathematics in Social Context
 MATH 525 Computational Algebra

Herkimer County Community College at Mohawk Correctional Facility
 MATH 124 Contemporary Mathematics

University of Nebraska–Lincoln

MATH 101 College Algebra
 MATH 203 Contemporary Mathematics
 MATH 300 Mathematics Matters [for future elementary educators]

All Girls/All Math

Codes and Cryptology

Guest Lecturer

Hamilton College

COLLEGE 371 Common Seminar Adirondacks Program
 HSPST 370 Postmodern Spain: New Narratives and New Technologies

Graduate Teaching Assistant

University of Nebraska–Lincoln

MATH 806T Number Theory & Cryptology
 MATH 811T Functions for Precalculus Teachers (Online)
 MATH 805T Discrete Math & Combinatorics
 Super-TA for all Calculus Courses

Pedagogical Engagement

Webinars and Online Trainings

<i>Mastery Grading Conference</i> , Online (14 hours)	MAY 2021
<i>PEDESTALS 2: Teaching Mathematics Remotely and Doing It Well</i> , College Bridge (8 hours)	SU 2020
<i>Embodying Liberatory Practices in the Classroom</i> , NYU Metro Center (1.5 hours)	JUN 2020
<i>Mastery Grading Conference</i> , Grand Valley State University (14 hours)	MAY 2020

Mathematical Association of America Minicourse

Alternative Grading	AUG 2019
Flipping the Classroom	JAN 2015

AHA! Group

Member; Race, Pedagogy, and Building an Antiracist Institution	AY 2020-21, AY 2021-22
Member; Research Advising in Virtual Environments	AY 2020-21, AY 2021-22
Attendee; Active Learning in STEM	SP 2020
Member; Decolonizing Education	AY 2018-19
Why I Teach	
Speaker; “Surprise, Satisfaction, and Joy”	DEC 2018
Curricular Development	
Math Department SSIH requirement	SU 2016
Talking About Teaching	
Panelist; Ada Lovelace Celebration	OCT 2018
Speaker; Inclusive Pedagogies: Teaching a Diverse Student Body	APR 2016
Consortium on High Achievement and Success (CHAS) Grant	
Alumna participant	SP 2017
Faculty Development on Teaching Diverse First-Year Students	SP 2016
Hamilton College DOF Reading Discussions	
Book: <i>What the Best College Teachers Do</i>	SU 2014
Book: <i>Teaching Naked</i>	SU 2015

Undergraduate Seminar Talks

Houghton College Math Department Colloquium	JAN 2022
Ithaca College Math Department Colloquium	FEB 2021
Connecticut College Senior Seminar	FEB 2021
Denison University Math and CS Colloquium	OCT 2019
Sacramento State Math Club & ANTC Colloquium	MAR 2017
Williams College AWM Student Chapter Kick-Off Talk	FEB 2017
Utica College Math Colloquium	FEB 2017
Adelphi University Math and Comp Sci Seminar	MAR 2015, SEP 2016
Hampshire College HCiSSM “Prime Time”	AUG 2013
Williams College Mathematics Seminar	JAN 2013
Bard College Mathematics Seminar	NOV 2012
William Jewell College Pi Mu Epsilon Colloquium	NOV 2012
The Colorado College Mathematics Seminar	APR 2010

SERVICE

To the Profession

Association for Women in Mathematics Roles and Activities	
Committee Member, Executive Committee	JAN 2022-2025
Committee Member, Education and Outreach Portfolio Committee	JAN 2022-2025
Committee Member, Search Committee for the next College Mathematics Journal editor	AY 2021-2022
Task Force Member, Noether Lecture Replacement at Joint Mathematics Meeting 2021	FA 2020
Session Organizer, Association for Women in Mathematics Panel - Equity, Ethics, and Bias in Mathematics, Joint Mathematics Meeting	FA 2020
Chair, Committee on Policy and Advocacy	NOV 2019-20
Committee Member, Committee on Policy and Advocacy	JAN 2018-20
Editor, Anneli Lax New Mathematics Editorial Board	2022-PRESENT
NSF Panelist	FA 2018 SP 2022
Session Organizer	
JMM, Atlanta, GA	JAN 2017
Commutative Algebra: Research for Undergraduate and Early Graduate Students (Special Session #8)	
1115th AMS Meeting, Rutgers University, New Brunswick, NJ	NOV 2015
Special Session on Aspects of Resolutions and Syzygies in Commutative Algebra	
Panelist	

ParaDIGMS , “Becoming comfortable with discomfort: moving from thoughts to action”	MAY 2022
Nebraska Conference for Undergrad. Women in Math (NCUWM) , “Random Bits of Advice”	FEB 2017
JMM : Joint Committee on Women in Mathematical Sciences; “Success in Graduate School”	JAN 2016
MathFest : Association for Women in Mathematics, “Mentoring Matters”	JUN 2014
Referee/Reviewer	
<i>Amer. Math. Monthly</i>	
<i>J. Commut. Algebra</i>	
<i>J. Algebra Appl.</i>	
<i>Mathematical Reviews</i>	
<i>Minnesota J. of Undergrad. Math.</i>	
<i>Comm. Algebra</i>	
Co-Founder, Co-Organizer, Co-PI	
KUMUNUjr Conference	2012-13
To Hamilton College	
Parliamentarian	AY 2020-21
Committee Member	
Committee on Academic Policy	AY 2019-2022
Chair	AY 2021-22
Committee on Academic Policy SmartCatalog Team	AY 2020-2022
Middle States Standard VII Working Group	FA 2019-20
Quantitative and Symbolic Reasoning Advisory Committee	AY 2018-19
Dean of Faculty Search Committee	FA 2017
Writing Advisory Committee	FA 2017-19
Honor Court	AY 2014-16
Service to Phi Beta Kappa (Epsilon of New York)	
President	AY 2017-20
Vice President	AY 2014-16
Committee on selection criteria	SP 2014
Member	2013-PRESENT
Calculus Czar	
Hamilton Math Department	FA 2017-PRESENT
Representative	
Liberal Arts Consortium for Online Learning	FA 2017-18
Consultant	
Counseling Center usage statistics and projections for David Walden	FA 2016
Focus Group Member	
Ellucian advising tool for Registrar’s Office	FA 2016
Faculty Advisor	
Hamilton College Student Chapter of the Association for Women in Mathematics	FA 2017-PRESENT
Hamilton College Vegan Club	AY 2014-15, 2017-PRESENT
Mathletics Coach (Putnam Team)	
with Prof. Andrew Dykstra	FA 2013, FA 2014
Caucus Participant	
Junior Faculty Caucus	AY 2014-18
Academic Advisor	AY 2014-PRESENT
Bristol Project Mentor , ×2	JAN 2020

To University of Nebraska–Lincoln

UNL Workshop for Graduate TAs Orientation Leader, Panelist	2010, 2011, 2012
UNL Annual Math Day volunteer	FA 2007-12
UNL Math Graduate Student Advisory Board representative	AY 2007-09

OUTREACH

Educational Presentations

The Other Side Utica, NY	
<i>The Mathematics of Online Privacy</i>	APR 2021
<i>Gerrymandering: Hijacking Democracy One Non-Convex Region at a Time</i>	OCT 2018
<i>The Mathematics of Climate Change</i>	OCT 2015
Talk Math with your Friends Online Colloquium Series	
The Real Friends are the Betti Numbers We Calculated Along the Way	OCT 2020
Institute for Advanced Study: Park City Mathematics Institute Park City, UT	
Ignite Talk From Zero to Syzygy in Five Minutes	JUL 2018
The Arthur Levitt Public Affairs Center	
<i>Gerrymandering: The Math Behind the Madness</i>	APR 2018
Hamilton College	
Days-Massolo Center “What is...?” series <i>What is... Gerrymandering?</i>	OCT 2018
The Card Catalog Project <i>Googling It: How Google Ranks Search Results</i>	OCT 2017
Emerson Literary Society <i>Sudoku, Apes, and Algebra: An ELS “Tell Us What You Know” Lecture</i>	FA 2015
Sigma Xi Colloquium <i>Syzygy: Understanding Relationships among Polynomials</i>	SP 2014

Community Engagement

Creator , YouTube Channel	PRESENT
Coordinator and Key Personnel , Math Chairs for Racial Justice	JUL 2021
Facilitator , Math Chairs for Racial Justice	JUL 2020, 2021
Penpal , Prison Mathematics Project (connecting incarcerated folks to math mentors) – 3 penpals	2020-PRESENT
Web Design Team Member , covidcp.org (a COVID-19 protocol sharing site)	SP 2020
Judge , Pfizer–Novartis–LPS Science Fair	2010, 2012
Classroom Leader , Saturday Science at UNL	FEB 2010

In the Media

In Print

<i>American Mathematical Society</i> page-a-day calendar illustration (Left-Handers Day)	AUG 2020
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Interviews

<i>My Favorite Theorem</i> math podcast Episode 73 - Courtney Gibbons	JAN 2022
<i>Significant Figures</i> podcast Courtney Gibbons (Math)	DEC 2021
<i>My Favorite Theorem</i> math podcast Episode 45: Your Flash Favorite Theorems (timestamp 3:48)	AUG 2019
<i>Roots of Unity</i> Scientific American blog “shout out” in Mathematical Mondegreens	AUG 2019
<i>Chronicle of Higher Ed</i> Teaching Newsletter , 10/5/17	OCT 2017
<i>Relatively Prime</i> math podcast Diegetic Plots: Chapter 2	FEB 2016
<i>Girls’ Angle Bulletin</i> volume 8, no. 3-4	FEB 2015, APR 2015

Featured Columns

AMS Feature Column: What’s a Prime and Who Decides?	NOV 2021
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Guest Columns

AMS Blog On Teaching and Learning Mathematics: Building Relationships Before the Semester Begins	MAY 2021
AMS Inclusion/Exclusion Blog: Women of Color: Who Tells Their Stories? (and why it matters)	MAY 2021
<i>The Global Math Department Newsletter</i>	
An AMC for the Mathematics Community (with B. Fantechi, M. VanDieren)	FEB 2021
Liberatory Mathematics for breaking out of jail	FEB 2021
<i>AMS Notices</i> Early Career column	MAY 2020
<i>AWM Newsletter</i> volume 49, no. 1: New NSF Funding Requirements	JAN 2019
<i>Girls’ Angle Bulletin</i> volume 10, no. 5: Errorbusters	JUN 2017
AMS <i>e-Mentoring Network Blog</i> : The Four Parts of No	JUN 2017
<i>Math Babe</i> mathbabe.org	FEB 2015

Actor

Mathematically Bent Theater at JMM	JAN 2014, JAN 2015, JAN 2017
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AWARDS, FELLOWSHIPS, AND AFFILIATIONS

Legislative Branch STPF Fellow , American Association for the Advancement of Science (AAAS)	2022
Partner , Institute for the Quantitative Study of Inclusion, Diversity, and Equity (QSIDE)	2020
The John R. Hatch Class of 1925 Excellence in Teaching Award , Hamilton College	2015
Project NExT Fellow , Mathematical Association of America	2013
Outstanding Graduate Teaching Assistant , UNL College of Arts and Sciences	2011
Emeritus Faculty Fellow , UNL Department of Mathematics	2010
Graduate Fellowship , UNL College of Arts and Sciences	2009
Outstanding Qualifying Exams , UNL Department of Mathematics	2008
Florian Cajori Prize in Mathematics , The Colorado College	2006

GRANT-SUPPORTED ACTIVITY

Math Leaders 4 Racial Justice Workshop Key Personnel, NSF Grant #DUE-2141578	SU 2022
Macaulay2 Virtual Workshop Co-PI, NSF Grant #DMS-2003883	SU 2020
Noncommutative Algebra , Emerson Project Advisor	SU 2019
Discovery-Based Algebra Activities , Hamilton Class of 1966 Career Development Award	SU 2016
WMC REU Research Mentor , NSF Grant #DMS-1460982	SU 2015
KUMUNUjr Co-PI, NSF Grant #DMS-1303248	SP 2013
Graduate Researcher , NSF Grant #DMS-1103176	SP 2012
GAANN Trainee , DOE Grant #200A90002	AY 2010
NebraskaMATH Assistant , NSF Grant #DUE-1035268	SU 2011, SU 2012, FA 2012
Project Fulcrum Resident Scientist, NSF Grant #DGE-0086358	AY 2009-10
MCTP Trainee , NSF Grant #DMS-0838463	AY 2007-08