Drew Johnson

Curriculum Vitae

Brigham Young University
Provo, UT
✉ *d.johnson@mathematics.byu.edu*

Positions

2020-present **Visiting Assistant Professor**, *Brigham Young University*, Provo, UT.

2019-2020 **Postdoctoral fellow**, *ETH Zürich*, Switzerland.

2016-2018 **Postdoctoral fellow**, *The University of Oregon*, Eugene, OR.

Education

2011–2016 **PhD, Mathematics**, *The University of Utah*, Salt Lake City.
Advisor: Aaron Bertram.
Thesis: Two enumerative problems in algebraic geometry. `http://content.lib.utah.edu/cdm/ref/collection/etd3/id/4206`

2011 **MS, Mathematics**, *Brigham Young University*, Provo.
Advisor: Tyler Jarvis
Thesis: An Algebra Isomorphism for the Landau-Ginzburg Mirror Symmetry Conjecture. `http://scholarsarchive.byu.edu/etd/2793/`

2009 **BS, Mathematics**, *Brigham Young University*, Provo.
Minor: Computer Science

Papers

The virtual K-theory of Quot schemes of surfaces, *with N. Arbesfeld, W. Lim, D. Oprea, R. Pandharipande*, in Journal of Geometry and Physics, vol. 164 (2021).
`https://doi.org/10.1016/j.geomphys.2021.104154`

Rationality of descendent series for Hilbert and Quot schemes of surfaces, *with Rahul Pandharipande and Dragos Oprea*, in Selecta Mathematica, New Series, vol. 27, no. 23 (2021).
`https://doi.org/10.1007/s00029-021-00638-1`

Representations in strange duality: Hilbert schemes paired with higher rank spaces, submitted.
Available on the arXiv: `1911.10962`

Birational models of $\mathcal{M}_{2,2}$ arising as moduli of curves with nonspecial divisors, *with Alexander Polishchuk*, Advances in Geometry, vol. 21, no. 1, (2021).
`https://doi.org/10.1515/advgeom-2020-0026`

Universal series for Hilbert schemes and strange duality, International Mathematics Research Notices, issue 10 (May 2020).
https://doi.org/10.1093/imrn/rny101

Le Potier's strange duality, quot schemes, and multiple point formulas for del Pezzo surfaces, *with Aaron Bertram and Thomas Goller*, submitted.
Available on the arXiv: 1610.04185

Determining tropical hypersurfaces.
Available on the arXiv: 1509.05815

Landau-Ginzburg Mirror Symmetry for orbifolded Frobenius algebras, *with Amanda Francis, Tyler Jarvis, and Rachel Suggs*, in Proceedings of Symposia in Pure Mathematics, vol. 85 (2012), p333-353.
http://www.ams.org/books/pspum/085/

Isoperimetric surfaces with boundary, *with Rebecca Dorff, Gary R. Lawlor, Donald Sampson*, in Proceedings of the American Mathematical Society, vol. 139 (2011).
https://doi.org/10.1090/S0002-9939-2011-10872-4

Other Projects

2021 **Invited peer reviewer**,
Journal of Pure and Applied Algebra.

2020 **Invited peer reviewer**,
Advances in Mathematics.

2019 **Master's paper supervisor**.

2018 **Invited peer reviewer**,
International Mathematics Research Notices
and Advances in Geometry.

2017 **Wrote Sage code to compute products on the moduli space of curves**.
Available for easy install from PyPI: http://pypi.python.org/pypi/mgn

2013 **Undergraduate research co-mentor**.
I assisted a post-doc in our department with mentoring an undergraduate researcher in a project involving the moduli space of curves

2010-2011 **Wrote code to compute FJRW invariants**.

2010-2011 **Wrote code to compute top intersections on the moduli space of curves**.
Available for easy install from PyPI pypi.python.org/pypi/mgn

2011 **Middle school summer math camp coach**.

2008-2009 **IMPACT undergraduate research group**.
Analyzed and compared algorithms for gas chromatography/mass spectrometry deconvolution

Talks

The ArXiv Club, Zoom Talk, *University of Campinas*, November 2021 (upcoming).

Invited Lecture, *Utrecht Geometry Center Seminar, the Netherlands*, *canceled due to weather and COVID*, May 2020.

Rationality of Descendant Series for Hilbert and Quot Schemes of Surfaces, *Algebraic Geometry Zoom Seminar*, April 2020.

Universal Series and Strange Duality, *Brigham Young University Colloquium*, Jan. 2020.

Strange Duality, and Generating Seires for Virtual Euler Characteristics, *(Three part lecture series) ETH Algebraic geometry and moduli seminar*, May 2019.

Universal Series and Strange Duality, *(Invited lecture) AMS Sectional Meeting: Special Section on Moduli Spaces*, Apr. 2018.

Universal Series and Strange Duality, *(Invited lecture) Workshop on Moduli Spaces of Sheaves on Surfaces*, Penn State University, Dec. 2017.

What is Tropical Geometry?, *Basic Notions Seminar*, University of Oregon, Nov. 2017.

Strange Duality, Quot Schemes, and Multiple Point Formulas, *Algebra Seminar*, University of Oregon, Oct. 2016.

Strange Duality for Del Pezzo Surfaces, *Algebraic Geometry Seminar*, University of Utah, Nov. 2014.

Determining Tropical Hypersurfaces, *Student Tropical Algebraic Geometry Seminar*, Yale University, May 2014.

Burnside's Orbit Counting Lemma, or How to Count Things, *Undergraduate and Graduate Colloquiums*, University of Utah, Oct. and Nov. 2013.

Busy Beavers and Big Numbers, *Undergraduate and Graduate Colloquiums*, University of Utah, April 2012, April 2015, Oct. 2015.

Computational Complexity, *Math Circle*, University of Utah, 2012.

Spring Research Conference, Brigham Young University, 2008-2010.
Best of section prize winner 2009 and 2010

Math Fest, Madison, Wisconsin, 2008.
MAA General Excellence Prize Winner

Fellowships

2013-2015 **NSF Research Training Grant**, *Algebraic Geometry and Topology at the University of Utah, number 1246989*, I was funded by this grant for three semesters.

2011-2012 **VIGRE vertical integration grant**, *University of Utah*, I was funded by this grant for two semesters.

Teaching Experience

Fall 2021 **Math for Engineers I**, *BYU*.

2021 **College Algebra Course Coordinator**, *BYU*.

Summer 2021 **Elementary Linear Algebra**, *BYU*.

Winter 2021 **Calculus II**, *BYU*.

Fall 2020 **Elemenatary Linear Algebra**, *BYU*.

Spring 2020 **Algebraic Geometry**, *ETH*.

Fall 2018 **Calculus II**, *U of O*.

Spring 2018 **Discrete Dynamical Systems**, *U of O*.

Winter 2018 **Elementary Linear Algebra II,**
Calculus II, *U of O*.

Fall 2017 **Elementary Linear Algebra**, *U of O*.

Winter 2017 **Calculus II**, *U of O*.

Fall 2016 **Calculus II**, *U of O*.

Spring 2016 **Calculus I**, *U of U*.

Fall 2014 **Business Algebra**, *U of U*.

Fall 2013 **Business Algebra**, *U of U*.

Spring 2013 **Quantitative Analysis**, *U of U*.

Fall 2012 **Business Algebra**, *U of U*.

Summer 2010 **Calculus I**, *BYU*.

Winter 2010 **Calculus Recitation Section Leader**, *BYU*.

Fall 2009 **Calculus Recitation Section Leader**, *BYU*.