# Vance T. Blankers

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## Academic Employment

Zelevinksy-RTG Postdoctoral Fellow — Fall 2019 – Present
Northeastern University — Boston, MA

## Research Interests

Moduli of Curves; Moduli Spaces; Combinatorial Algebraic Geometry; Birational Geometry; Enumerative Geometry

## Education

Doctorate of Philosophy in Mathematics — May 2019
Colorado State University (CSU) — Fort Collins, CO
Thesis: *Properties of tautological classes and their intersections*
Advisor: Dr. Renzo Cavalieri

Bachelor of Arts in Mathematics Minor in Physics — May 2012
Concordia College — Moorhead, MN
Credo Honors Scholar, Summa Cum Laude

## Papers

Published

V. Blankers, R. Cavalieri. *Witten's conjecture and recursions for $\kappa$ classes*, European Journal of Mathematics (2021), 3, 309–339.

V. Blankers, R. Cavalieri. *Wall-crossings for Hassett descendant potentials*, International Mathematics Research Notices (2020), doi:10.1093/imrn/rnaa077.

V. Blankers. *Hyperelliptic classes are rigid and extremal in genus two*, Épijournal de Géométri Algébrique, Volume 4 (2020), Article no.2.

V. Blankers, T. Rendfrey, A. Shukert, P. Shipman. *Julia and Mandelbrot sets for dynamics over the hyperbolic numbers*, Fractal Fract (2019), 3(1), 6.

V. Blankers, R. Cavalieri. *Intersections of $\omega$ classes in $\overline{\mathcal{M}}_{g,n}$*, Proceedings of Gökova Geometry-Topology Conference (2018).

Submitted

V. Blankers. *Extremality of rational tails boundary strata in $\overline{\mathcal{M}}_{g,n}$*, available at arXiv:2002.12403.

## Teaching

Northeastern University — Boston, MA

MATH 7363 – Introduction to Moduli Spaces — Fall 2021
MATH 3175 – Group Theory — Fall 2020
DATA SCIENCE 2001 – Programming with Data: Science Practicum — Spring 2020
MATH 1365 – Introduction to Mathematical Reasoning — Fall 2019

Colorado State University — Fort Collins, CO

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| MATH 271, 272 – Applied Math for Chemists | Fall 2017 – Spring 2019 |
| MATH 317 – Advanced Calculus of One Variable | Summer 2016 |
| MATH 255 – Calculus for Biological Scientists II | Spring 2016, Fall 2016 |
| MATH 161 – Calculus for Physical Scientists II | Fall 2015, Spring 2019 |
| MATH 180 – One Year Calculus I | Fall 2014 – Spring 2015 |
| MATH 155 – Calculus for Biological Scientists I | Fall 2013, Spring 2014 |

## Additional Experience

ClearEdge3D, Research and Development Intern — Denver, CO

Algorithm Development and Implementation — Summer 2019

Cargill, Inc.; Statistical Analysis Intern — Wayzata, MN

Statistical Modeling; Large Data Analysis, Interpretation, and Prediction — Summer 2012

## Conference and Seminar Talks

Invited

(Upcoming) *Tropicalizing compactifications of* $\mathcal{M}_{0,n}$ — March 2022
AMS Special Session on Moduli in Algebraic and Tropical Geometry. Medford, MA

(Upcoming) *Classifying compactifications of* $\mathcal{M}_{g,n}$ — November 2021
Valley Geometry Seminar at UMass Amherst. Amherst, MA

*Alternative compactifications of the moduli space of curves* — September 2021
Virginia Commonwealth University G&T Seminar. Richmond, VA

*Alternative compactifications of the moduli space of curves* — September 2021
Simon Fraser University NTAG Seminar. Burnaby, BC

*Extremality of rational tails strata in* $\overline{\mathcal{M}}_{g,n}$ — October 2020
Boston College NT & AG Seminar. Boston, MA

*Extremal strata in* $\overline{\mathcal{M}}_{g,n}$ — May 2020
FRAGMENT[1] Seminar. Fort Collins, CO

*Wall-crossings for descendant potentials on Hassett spaces* — January 2020
AMS Special Session on Cohomological Field Theories and Wall Crossing. Denver, CO

*Witten's conjecture and recursions for* $\kappa$ *classes* — November 2018
Northeastern University GPRT[2] Seminar. Boston, MA

*Descendant potentials for Hassett spaces with diagonal weights* — May 2018
Crossing the Walls in Enumerative Geometry conference. Snowbird, UT

*Witten's conjecture for* $\kappa$*-classes* — April 2018
AMS Sectional; Special meeting on Moduli Spaces. Portland, OR

*Combinatorial structures in moduli spaces of stable pointed curves* — February 2018
SF State Geometry & Topology Seminar. San Francisco, CA

Contributed

*The triangle of triangles* — March 2021
NU Math Club. Boston, MA

[1] Front Range interested in Algebra, GeoMEtry and Number Theory
[2] Geometry, Physics, and Representation Theory

*Life after graduate school* — September 2020
CSU AMS Alumni Series. Fort Collins, CO

*The tautological ring of the moduli space of curves* — September 2019
NU Pick My Brain Seminar. Boston, MA

*The Witten conjecture for $\kappa$-classes on the moduli space of curves* — January 2019
Joint Math Meetings. Baltimore, MD

*Descendant potentials on Hassett spaces and the Witten conjecture for $\kappa$-classes* — September 2018
FRAGMENT Seminar. Fort Collins, CO

*Hyperelliptic classes are rigid and extremal in genus two* — January 2018
Joint Math Meetings. San Diego, CA

*Hyperelliptic classes are rigid and extremal in genus two* (poster) — October 2017
WAGS[3]. Los Angeles, CA

*The recursive structure of hyperelliptic loci in moduli spaces of curves* — September 2017
FRAGMENT Seminar. Fort Collins, CO

Greenslopes Graduate Seminar (CSU)

*Alice and Bob: a Love Story* — February 2019
*Career Killers - Fun Problems to Avoid* — September 2018
*Some Differential Equations in Enumerative Geometry* — February 2018
*Impossible Things and Where to Find Them* — August 2017
*Topological Primes* — February 2017
*Obstructions and Pathologies* — October 2016
*Fat Points Nowhere and Everywhere: a Brief Introduction to Schemes* — February 2016
*Graph Theory on the Moduli Space of Curves* — September 2015
*The Double Ramification Cycle* — April 2015
*Counting Curves, Stable Maps, and Gromov-Witten Invariants* — September 2014

Splinter Graduate Seminar (CSU)

*Schemes and You* — February 2019
*The tautological ring of the moduli space of curves* — September 2018
*A differential operator on generating functions of intersection numbers* — October 2017
*Stick-figure Reproduction (and Graph Multiplication)* — March 2017
*Hyperelliptic Curve Classes on $\overline{\mathcal{M}}_{g,n}$* — October 2016

Category Theory Lab (CSU)

*Sheaves in category theory and algebraic geometry* — October 2018
*Moduli problems* — July 2018

Mathematical Physics Lab (CSU)

*Introduction to Minkowski space* — February 2019

SPAM[4] Lab (CSU)

*Mandelbrot and Julia sets over the hyperbolic numbers* — October 2018

## Workshops

Riemann Surfaces and Their Moduli Spaces — February 2020
Salt Lake City, UT

[3]Western Algebraic Geometry Symposium
[4]Solving Problems in Applied Math

Stability, Moduli Spaces and Applications — December 2019
Chicago, IL
Flat Surfaces and Algebraic Curves — September 2018
Oberwolfach, Germany
Crossing the Walls in Enumerative Geometry — May 2018
Snowbird, UT
University of Georgia Summer Workshop in Algebraic Geometry — August 2016
Athens, GA
Summer School in Gromov-Witten Theory — June – July 2014
Pingree Park, CO

## Math Outreach and Service

NSMRP[5] REU Co-organizer — Summer 2021
GPRT Seminar Co-organizer — Fall 2020 – Present
Lunch in the Time of COVID Co-organizer — Summer 2020 – Present
Referee for Geometry & Topology — Summer 2020 – Present
Referee for Communications in Mathematical Physics — Summer 2020 – Present
CSU Summer REU Leader — Summer 2018
Dynamics Over the Hyperbolic Numbers
Splinter Graduate Seminar Organizer — Spring 2018
American Mathematical Society (AMS) — Fall 2017 – Present
CSU Student Chapter Treasurer — Fall 2017 – Spring 2019
Graduate Student Mentor — Fall 2016 – Spring 2018
Society of Applied and Industrial Mathematics (SIAM) — Fall 2013 – Spring 2019
Student Chapter member
Northern Colorado Math Circles (for Middle School Students)
Session Facilitator
*Decomposing Compositions* — Summer 2018
*Eot-Cat-Cit* — Summer 2017
*It's All Greek to Me: Math in the Ancient World* — Summer 2016
*Möbius Strips* — Summer 2015
CSU Graduate Student Representative — Fall 2016 – Spring 2017
WAGS Co-organizer — Fall 2016
MindMELD[6] Co-organizer — Fall 2015 – Spring 2016
FRAGMENT Co-organizer — Fall 2015
Greenslopes Graduate Seminar Co-organizer — Spring 2015

[5] Northeastern Summer Math Research Program
[6] Mindful Mathematics Education, Learning, and Didactics