

# Vance T. Blankers

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## Academic Employment

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Zelevinsky-RTG Postdoctoral Fellow  
Northeastern University

Fall 2019 – Present  
Boston, MA

## Research Interests

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

## Education

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Doctorate of Philosophy in Mathematics  
Colorado State University (CSU)

May 2019  
Fort Collins, CO

Thesis: *Properties of tautological classes and their intersections*  
Advisor: Dr. Renzo Cavalieri

Bachelor of Arts in Mathematics Minor in Physics  
Concordia College  
Credo Honors Scholar, Summa Cum Laude

May 2012  
Moorhead, MN

## Papers

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### 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 Géométrie Algébrique, Volume 4 (2020), Article no.2.
- V. Blankers. *Properties of tautological classes and their intersections*, Dissertation, Colorado State University (2019).
- 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.

### In Progress

- V. Blankers, S. Bozlee. *A classification of Gorenstein compactifications of  $\mathcal{M}_{1,n}$  with colliding markings*.
- V. Blankers, S. Bozlee. *Intersections of  $\psi$ -classes on Gorenstein compactifications of  $\mathcal{M}_{0,n}$  and  $\mathcal{M}_{1,n}$* .

## Teaching

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Northeastern University, as Instructor of Record	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, as Instructor of Record	Fort Collins, CO
MATH 271, 272 – Applied Math for Chemists	Fall 2017 – Spring 2018 Fall 2018 – 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

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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

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Invited	
(Upcoming) <i>Tropicalizing compactifications of <math>\mathcal{M}_{0,n}</math></i> AMS Special Session on Moduli in Algebraic and Tropical Geometry. Medford, MA	March 2022
(Upcoming) <i>Classifying compactifications of <math>\mathcal{M}_{g,n}</math></i> Valley Geometry Seminar at UMass Amherst. Amherst, MA	November 2021
<i>Alternative compactifications of the moduli space of curves</i> Virginia Commonwealth University G&T Seminar. Richmond, VA	September 2021
<i>Alternative compactifications of the moduli space of curves</i> Simon Fraser University NTAG Seminar. Burnaby, BC	September 2021
<i>Extremality of rational tails strata in <math>\overline{\mathcal{M}}_{g,n}</math></i> Boston College NT & AG Seminar. Boston, MA	October 2020
<i>Extremal strata in <math>\overline{\mathcal{M}}_{g,n}</math></i> FRAGMENT Seminar. Fort Collins, CO	May 2020
<i>Wall-crossings for descendant potentials on Hassett spaces</i> AMS Special Session on Cohomological Field Theories and Wall Crossing. Denver, CO	January 2020
<i>Witten's conjecture and recursions for <math>\kappa</math> classes</i> Geometry, Physics, and Representation Theory Seminar. Boston, MA	November 2018
<i>Descendant potentials for Hassett spaces with diagonal weights</i> Crossing the Walls in Enumerative Geometry conference. Snowbird, UT	May 2018
<i>Witten's conjecture for <math>\kappa</math>-classes</i> AMS Sectional; Special meeting on Moduli Spaces. Portland, OR	April 2018

<i>Combinatorial structures in moduli spaces of stable pointed curves</i> SF State Geometry & Topology Seminar. San Francisco, CA	February 2018
<b>Contributed</b>	
<i>Intersection theory on the moduli space of curves</i> NU Math Club. Boston, MA	November 2021
<i>Compactifying the moduli space of curves</i> NU Pick My Brain Seminar. Boston, MA	October 2021
<i>The triangle of triangles</i> NU Math Club. Boston, MA	March 2021
<i>Life after graduate school</i> CSU AMS Alumni Series. Fort Collins, CO	September 2020
<i>The tautological ring of the moduli space of curves</i> NU Pick My Brain Seminar. Boston, MA	September 2019
<i>The Witten conjecture for <math>\kappa</math>-classes on the moduli space of curves</i> Joint Math Meetings. Baltimore, MD	January 2019
<i>Descendant potentials on Hassett spaces and the Witten conjecture for <math>\kappa</math>-classes</i> FRAGMENT Seminar. Fort Collins, CO	September 2018
<i>Hyperelliptic classes are rigid and extremal in genus two</i> Joint Math Meetings. San Diego, CA	January 2018
<i>Hyperelliptic classes are rigid and extremal in genus two (poster)</i> Western Algebraic Geometry Symposium. Los Angeles, CA	October 2017
<i>The recursive structure of hyperelliptic loci in moduli spaces of curves</i> FRAGMENT Seminar. Fort Collins, CO	September 2017
<b>Greenslopes Graduate Seminar (CSU)</b>	
<i>Alice and Bob: a Love Story</i>	February 2019
<i>Career Killers - Fun Problems to Avoid</i>	September 2018
<i>Some Differential Equations in Enumerative Geometry</i>	February 2018
<i>Impossible Things and Where to Find Them</i>	August 2017
<i>Topological Primes</i>	February 2017
<i>Obstructions and Pathologies</i>	October 2016
<i>Fat Points Nowhere and Everywhere: a Brief Introduction to Schemes</i>	February 2016
<i>Graph Theory on the Moduli Space of Curves</i>	September 2015
<i>The Double Ramification Cycle</i>	April 2015
<i>Counting Curves, Stable Maps, and Gromov-Witten Invariants</i>	September 2014
<b>Splinter Graduate Seminar (CSU)</b>	
<i>Schemes and You</i>	February 2019
<i>The tautological ring of the moduli space of curves</i>	September 2018
<i>A differential operator on generating functions of intersection numbers</i>	October 2017
<i>Stick-figure Reproduction (and Graph Multiplication)</i>	March 2017
<i>Hyperelliptic Curve Classes on <math>\overline{\mathcal{M}}_{g,n}</math></i>	October 2016
<b>Category Theory Lab (CSU)</b>	
<i>Sheaves in category theory and algebraic geometry</i>	October 2018
<i>Moduli problems</i>	July 2018
<b>Mathematical Physics Lab (CSU)</b>	
<i>Introduction to Minkowski space</i>	February 2019

Solving Problems in Applied Math Lab (CSU)  
*Mandelbrot and Julia sets over the hyperbolic numbers*

October 2018

## Workshops

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### Co-organized

(Submitted) Combinatorics of Moduli of Curves Summer 2023  
Banff International Research Station, Alberta, Canada

### Attended

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

## Service

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### Organizing

Pick My Brain Seminar Fall 2021 – Present  
NU Summer Math Research Program REU Summer 2021  
Geometry, Physics, and Representation Theory Seminar Fall 2020 – Present  
Lunch in the Time of COVID Seminar Summer 2020 – Present  
CSU Summer REU Summer 2018  
Dynamics Over the Hyperbolic Numbers  
Splinter Graduate Seminar Spring 2018  
Math Grads Tube Water Polo Manager Fall 2017 – Spring 2019  
Western Algebraic Geometry Symposium Fall 2016  
Mindful Mathematics Education, Learning, and Didactics Fall 2015 – Spring 2016  
FRAGMENT Fall 2015  
Math Grads Soccer Manager Summer 2015  
Greenslopes Graduate Seminar Spring 2015

### Mentoring

Northeastern Graduate Student Mentor Fall 2021 – Present  
Graduate Student Mentor Fall 2016 – Spring 2018  
CSU Graduate Student Representative Fall 2016 – Spring 2017

### Refereeing

Referee for Geometry & Topology Summer 2020 – Present  
Referee for Communications in Mathematical Physics Summer 2020 – Present

### Association Participation

American Mathematical Society (AMS) Fall 2017 – Present  
CSU Student Chapter Founder/Treasurer Fall 2017 – Spring 2019

Society of Applied and Industrial Mathematics  
Student Chapter Member

Fall 2013 – Spring 2019

Other Outreach

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