

# Vance T. Blankers

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## Current Employment

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Associate Director for Research Development and Collaboration  
College of Science, Northeastern University

Spring 2022 – 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)

Thesis: *Properties of tautological classes and their intersections*

Advisor: Dr. Renzo Cavalieri

May 2019  
Fort Collins, CO

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. *Extremality of rational tails boundary strata in  $\overline{\mathcal{M}}_{g,n}$* , to appear, European Journal of Mathematics (2021), available at arXiv:2002.12403.
- 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).

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 – Applied Math for Chemists I	Fall 2017, Fall 2018
MATH 272 – Applied Math for Chemists II	Spring 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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Northeastern University, Zelevinsky RTG Postdoctoral Fellow	Boston, MA
Mathematics Research and Teaching	Fall 2019 – Fall 2021
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>	March 2022
AMS Special Session on Moduli in Algebraic and Tropical Geometry. Medford, MA	
<i>An alphabet of stability conditions</i>	November 2021
Valley Geometry Seminar at UMass Amherst. Amherst, MA	
<i>Alternative compactifications of the moduli space of curves</i>	September 2021
Virginia Commonwealth University G&T Seminar. Richmond, VA	
<i>Alternative compactifications of the moduli space of curves</i>	September 2021
Simon Fraser University NTAG Seminar. Burnaby, BC	
<i>Extremality of rational tails strata in <math>\overline{\mathcal{M}}_{g,n}</math></i>	October 2020
Boston College NT & AG Seminar. Boston, MA	
<i>Extremal strata in <math>\overline{\mathcal{M}}_{g,n}</math></i>	May 2020
FRAGMENT Seminar. Fort Collins, CO	
<i>Wall-crossings for descendant potentials on Hassett spaces</i>	January 2020
AMS Special Session on Cohomological Field Theories and Wall Crossing. Denver, CO	
<i>Witten's conjecture and recursions for <math>\kappa</math> classes</i>	November 2018
Geometry, Physics, and Representation Theory Seminar. Boston, MA	
<i>Descendant potentials for Hassett spaces with diagonal weights</i>	May 2018
Crossing the Walls in Enumerative Geometry conference. Snowbird, UT	

<i>Witten's conjecture for <math>\kappa</math>-classes</i>	April 2018
AMS Sectional; Special meeting on Moduli Spaces. Portland, OR	
<i>Combinatorial structures in moduli spaces of stable pointed curves</i>	February 2018
SF State Geometry & Topology Seminar. San Francisco, CA	
<b>Contributed</b>	
<i>Career Killers - Fun Problems to Avoid</i>	November 2021
NU Math Club. Boston, MA	
<i>Compactifying the moduli space of curves</i>	October 2021
NU Pick My Brain Seminar. Boston, MA	
<i>The triangle of triangles</i>	March 2021
NU Math Club. Boston, MA	
<i>Life after graduate school</i>	September 2020
CSU AMS Alumni Series. Fort Collins, CO	
<i>The tautological ring of the moduli space of curves</i>	September 2019
NU Pick My Brain Seminar. Boston, MA	
<i>The Witten conjecture for <math>\kappa</math>-classes on the moduli space of curves</i>	January 2019
Joint Math Meetings. Baltimore, MD	
<i>Descendant potentials on Hassett spaces and the Witten conjecture for <math>\kappa</math>-classes</i>	September 2018
FRAGMENT Seminar. Fort Collins, CO	
<i>Hyperelliptic classes are rigid and extremal in genus two</i>	January 2018
Joint Math Meetings. San Diego, CA	
<i>Hyperelliptic classes are rigid and extremal in genus two (poster)</i>	October 2017
Western Algebraic Geometry Symposium. Los Angeles, CA	
<i>The recursive structure of hyperelliptic loci in moduli spaces of curves</i>	September 2017
FRAGMENT Seminar. Fort Collins, CO	
<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

Mathematical Physics Lab (CSU) <i>Introduction to Minkowski space</i>	February 2019
Solving Problems in Applied Math Lab (CSU) <i>Mandelbrot and Julia sets over the hyperbolic numbers</i>	October 2018

## Workshops

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### Co-organized

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

(Upcoming) Summer Graduate School in Tropical Geometry (as TA) Mathematical Sciences Research Institute (MSRI), Morgana, CA	August 2022
Riemann Surfaces and Their Moduli Spaces Salt Lake City, UT	February 2020
Stability, Moduli Spaces and Applications Chicago, IL	December 2019
Flat Surfaces and Algebraic Curves Oberwolfach, Germany	September 2018
Crossing the Walls in Enumerative Geometry Snowbird, UT	May 2018
University of Georgia Summer Workshop in Algebraic Geometry Athens, GA	August 2016
Summer School in Gromov-Witten Theory Pingree Park, CO	June – July 2014

## Service

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### Organizing

Pick My Brain Seminar	Fall 2021
NU Summer Math Research Program REU	Summer 2021
Geometry, Physics, and Representation Theory Seminar	Fall 2020 – Fall 2021
Lunch in the Time of COVID Seminar	Summer 2020 – Present
CSU Summer REU Dynamics Over the Hyperbolic Numbers	Summer 2018
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
Graduate Student Mentor	Fall 2016 – Spring 2018
CSU Graduate Student Representative	Fall 2016 – Spring 2017

### Refereeing

Referee for Geometry & Topology  
Referee for Communications in Mathematical Physics

Summer 2020 – Present  
Summer 2020 – Present

Association Participation

American Mathematical Society (AMS)  
CSU Student Chapter Founder/Treasurer  
Society of Applied and Industrial Mathematics  
Student Chapter Member

Fall 2017 – Present  
Fall 2017 – Spring 2019  
Fall 2013 – Spring 2019

Other Outreach

Northern Colorado Math Circles (for Middle School Students)

Session Facilitator

*Decomposing Compositions*

*Eot-Cat-Cit*

*It's All Greek to Me: Math in the Ancient World*

*Möbius Strips*

Summer 2018

Summer 2017

Summer 2016

Summer 2015