

# 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  $\overline{\mathcal{M}}_{g,n}$* , European Journal of Mathematics (2022), 8, 523–539.
- 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, S. Bozlee. *A classification of Gorenstein compactifications of  $\mathcal{M}_{1,n}$  with colliding markings*, available at arXiv:2208.09745.

### In Progress

- 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 1342 – Calculus 2 for Science and Engineering	Fall 2022
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, Teaching, and Outreach	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	
<i>Panel: Life With a Math Major</i> (moderator)	April 2022
Western Algebraic Geometry Symposium. Fort Collins, CO	
<i>Colliding point compactifications of the moduli space of curves</i>	April 2022
Tufts Algebra Seminar. Medford, MA	
<i>An alphabet of stability conditions</i>	March 2022
NU Topology Seminar. Boston, MA	
<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	

#### Contributed

<i>Fractals in Minkowski Space</i>	October 2022
NU Math Club. Boston, MA	
<i>Alice and Bob: a Love Story</i>	February 2022
NU Math Club. Boston, MA	
<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	

#### Greenslopes Graduate Seminar (CSU)

<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

## Splinter Graduate Seminar (CSU)

<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

## Category Theory Lab (CSU)

<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
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## Solving Problems in Applied Math Lab (CSU)

<i>Mandelbrot and Julia sets over the hyperbolic numbers</i>	October 2018
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## Workshops

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### Attended

Summer Graduate School in Tropical Geometry (as TA)	August 2022
Mathematical Sciences Research Institute (MSRI), Moraga, CA	
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
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	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
Graduate Student Mentor	Fall 2016 – Spring 2018
CSU Graduate Student Representative	Fall 2016 – Spring 2017
Refereeing	
Referee for Selecta Mathematica	
Referee for Geometry & Topology	
Referee for Combinatorial Theory	
Referee for Communications in Mathematical Physics	
Association Participation	
American Mathematical Society (AMS)	Fall 2017 – Present
CSU Student Chapter Founder/Treasurer	Fall 2017 – Spring 2019
Society of Applied and Industrial Mathematics	Fall 2013 – Spring 2019
Student Chapter Member	
Other Outreach	
Northern Colorado Math Circles (for Middle School Students)	
Session Facilitator	
<i>Decomposing Compositions</i>	Summer 2018
<i>Eot-Cat-Cit</i>	Summer 2017
<i>It's All Greek to Me: Math in the Ancient World</i>	Summer 2016
<i>Möbius Strips</i>	Summer 2015