

Damiano Fulghesu

Contact information

Address: 1104 7th Ave. South
Moorhead, MN 56563
Phone: (+1) 218-477-4017
Mobile: (+1) 218-443-4914
E-mail: fulghesu@mnstate.edu
Web page: <http://web.mnstate.edu/fulghesu>

Personal Data

Citizenship: American Citizen
Languages: English, Italian, French

Education

Ph.D. Degree Jul 2005 from Scuola Normale Superiore, Pisa (Italy)
On the Chow ring of the moduli stack of rational nodal curves, advisor Angelo Vistoli
Master's Degree Dec 2002 from Scuola Normale Superiore, Pisa (Italy)
Intersection theory on algebraic stacks, advisor Angelo Vistoli
Bachelor's Degree Oct 2001 from University of Pisa, Pisa (Italy)
Prym Varieties and Intermediate Jacobians, advisor Enrico Arbarello

Positions Held

2016-present Associate Professor
Department of Mathematics, Minnesota State University Moorhead, Moorhead, MN
12/2017 Visiting Professor (during Sabbatical Leave)
and 03/2018 Department of Mathematics, Colorado College, Colorado Springs, CO
2017-2018 Visiting Professor (during Sabbatical Leave)
Department of Mathematics, Colorado State University, Fort Collins, CO
2010-2016 Assistant Professor
Department of Mathematics, Minnesota State University Moorhead, Moorhead, MN
2009-2010 Post Doctoral Fellow
Institut de Recherche Mathématique Avancée, University of Strasbourg, Strasbourg, (France)
2009 Research Associate
Scuola Normale Superiore Pisa (Italy)
2005-2008 Post Doctoral Fellow and Visiting Assistant Professor
Department of Mathematics, University of Missouri-Columbia, Columbia, MO
2005 Research Associate
Department of Mathematics, University of Bologna, Bologna (Italy)

Grants and Awards

April 2017 **Excellence in Teaching Award:** Sigma Alpha Pi
The National Society of Leadership and Success
2015 - 2020 **Simons Foundation: Collaboration Grant for Mathematicians**
Dec 2015 **Dill Fund for Excellence Grant Award:** Minnesota State University, Moorhead
Feb 2015 **Individual Research Grant:** Minnesota State University Moorhead
Oct 2013 **Faculty Development Associate:** Team Grant for Project Kaleidoscope,
STEM Leadership, Minnesota State University Moorhead
Jan 2002 **Prize "Benedetto Sciarra":** awarded for best undergraduate thesis in Mathematics
for the years 2000-2001
Oct 1997 **Alfiere del Lavoro:** awarded for excellence in high school studies
by the President of the Italian Republic, Oscar Luigi Scalfaro
July 1997 **Honorable Mention:** awarded at the International Mathematical Olympiads
held at Mar del Plata, Argentina

Research Interests

Algebraic Geometry, Moduli Spaces of Curves, Geometric Invariant Theory, Intersection Theory, Commutative Algebra, Complex Manifolds, Hyperbolicity, Birational Geometry, Geometric Theory of Groups, Special Polynomials.

Research Support and Short Visits

June 2014-2018 Visits at Scuola Normale Superiore Pisa, Italy.
April 2017 Visit at University of Missouri, Columbia, MO.
June 2016 Visit at University of Leipzig, Germany.
June 2011 Visit at Institut de Recherche Mathématique Avancée Strasbourg, France.

Supervised Undergraduate Research

- **Published Paper**

Shrijana Gurung: Right Tetrahedra and Pythagorean Quadruplets.
Minnesota Journal of Undergraduate Mathematics, [S.l.], v.4, n. 1, aug. 2018. ISSN 2378-5810.

- **Presentations at the Minnesota Undergraduate Scholars Conference**

Pratik Dahal: The Isoperimetric Inequality. Winona, MN; April 13th, 2015.
Shrijana Gurung: Pythagorean Quadruples. Winona, MN; April 13th, 2015.

- **Presentations at the Student Academic Conference, MSUM**

Iwentim Abate: Algebraicity of Limit Cycles. Moorhead, MN; April 15th, 2014.
Shouvik Bhattacharya: Limit Cycles. Moorhead, MN; April 16th, 2013.
Samuel Erickson: An Examination of the Union-Closed Sets Conjecture. Moorhead, MN; April 14th, 2015.
Rostand Armel Fezeu: A possible Generalization of Bertrands Postulate. Moorhead, MN; April 14th, 2015 and April 12th, 2016.
Seth Mayer: Generalized Peano Functions. Moorhead, MN; April 16th, 2013.
Connor Stotts: Analysis of Rocket Flight Path. Moorhead, MN; April 14th, 2015.

Supervised Mathematical Contests

Shouvik Bhattacharya, Murshid Saqlain, and Pragalv Karki: awarded as Honorable Mention in the Mathematical Contest in Modeling organized by COMAP; 2012.

Publications

1. *Arithmetic sets in groups*, with Azer Akhmedov, Math. Zeit. (2018), pp. 1-12.
2. *Polynomials whose coefficients coincide with their zeros*, with Oksana Bihun, Aeq. Math. 92 (2018), no. 3, pp. 453-470.
3. *The Chow ring of the Stack of Smooth Plane Cubics*, with Angelo Vistoli, Mich. Math. Journal 67 (2018), no. 1, pp. 3-29.
4. *Normalization of the 1-stratum of the moduli space of stable curves*, with Dan Edidin, Port. Math. 69 (2012), no. 3, pp. 167-192.
5. *The Chow ring of the stack of cyclic covers of the projective line*, with Filippo Viviani, Ann. Inst. Fourier 61 (2011), no. 6, pp. 2249-2275.
6. *The Chow ring of the stack of rational curves with at most 3 nodes*, Comm. Algebra 38 (2010), no. 9, pp. 3125-3136.
7. *Tautological classes of the stack of rational nodal curves*, Comm. Algebra 38 (2010), no. 8, pp. 2677-2700.

8. *The stack of rational nodal curves*,
Comm. Algebra 38 (2010), no. 7, pp. 2405-2417.
9. *The integral Chow ring of the stack of hyperelliptic curves of even genus*, with D. Edidin,
Math. Res. Lett. 16 (2009), no. 1, pp. 27-40.
10. *The integral Chow ring of the stack of at most 1-nodal rational curves*, with D. Edidin,
Comm. Algebra 36 (2008), no. 2, pp. 581-594.
11. *On generalized Kummer of rank 3 vector bundles over a genus 2 curve* with A. Bernardi,
Le Matematiche Vol. LVIII (2003) Fasc. II, pp. 237-255.

Work in Progress

12. *The Chow ring of the stack of smooth plane quartics*, with Andrea Di Lorenzo and Angelo Vistoli.
13. *On the intersection ring of Kontsevich's spaces*, with Renzo Cavalieri.
14. *A conjectural generalization of Bertrand's postulate*, with Rostand Armel Fezeu.
15. *Tiles in finitely generated groups*, with Azer Akhmedov.
16. *Dynamical systems on algebraic varieties*, with Oksana Bihun.

Organizational Activities

- | | |
|-------------------|--|
| April 14-15, 2018 | AMS Spring Western Sectional Meeting, Special Session on Moduli Spaces,
Co-organized with Renzo Cavalieri, Portland State University. Portland, OR. |
| Spring 2016 | Faculty professional development workshop at MSUM about promoting inclusion.
Facilitator of a discussion group on teaching techniques aimed to support diversity. |
| Spring 2014 | Co-organizer with Justin James of a series of faculty workshops on
"Metacognition and Motivation". |
| Fall 2013 | Co-organizer with Justin James of a series of faculty workshops on
"STEM Teaching Toolbox". |

Invited Talks

1. FRAGMENT: Front Range interested in Algebra, GeoMEtry and Number Theory,
University of Colorado, Boulder, CO.
Title: Intersection Theory of Irreducible Plane Curves. March 5, 2019.
2. Colorado Springs Algebra Seminar, University of Colorado Springs, CO.
Title: Tilings of Finitely Generated Groups. October 24, 2018.
3. A Mathematics Talk, Colorado State University, Pueblo, CO.
Title: Counting Curves. March 6, 2018.
4. Fearless Friday, Colorado College, Colorado Springs, CO.
Title: A glimpse of Enumerative Geometry. March 2, 2018.
5. Math Club Seminar, University of Northern Colorado, Greeley, CO.
Title: Bézout's Theorem for Plane Curves. February 21, 2018.
6. Algebra and Logic Seminar, University of Denver, Denver, CO.
Title: Families of Plane Curves. November 17, 2017.
7. Lectures on Introduction to Algebraic Stacks, Colorado State University, Fort Collins, CO.
Weekly meetings during October 2017 - April 2018.
8. FRAGMENT: Front Range interested in Algebra, GeoMEtry and Number Theory,
Colorado State University, Fort Collins, CO.
Title: From Classical to Equivariant Intersection Theory. August 31, 2017.

9. Geometry/Topology Seminars, University of Missouri, Columbia, MO.
Title: Enumerative Geometry of a Moduli Stack of Hypersurfaces. April 6, 2017
10. Seminari Classe di Scienze, Scuola Normale Superiore, Pisa, Italy.
Title: L'anello di Chow dello stack delle cubiche piane lisce. June 16, 2016.
11. Math Colloquium Series, University of Colorado, Colorado Springs, CO.
Title: Arithmetic Sets in Groups. March 17, 2016.
12. FRAGMENT: Front Range interested in Algebra, GeoMEtry and Number Theory, Colorado State University, Fort Collins, CO.
Title: Enumerative Geometry of the Moduli Stack of Plane Cubics. October 22, 2015.
13. Tri-College Colloquium Talk, North Dakota State University, Fargo, ND.
Title: Enumerative Geometry of the Moduli Stack of Smooth Hypersurfaces. March 31, 2015.
14. Mathematics Undergraduate Seminar, MSUM, Moorhead, MN.
Title: Introduction to Zermelo-Fraenkel Axioms. January 21-28, 2015.
15. Seminari Classe di Scienze, Scuola Normale Superiore, Pisa, Italy.
Title: L'anello di intersezione a coefficienti interi di stack di moduli di curve. June 9, 2014.
16. Algebraic Geometry Seminar, Ohio State University, Columbus, OH.
Title: The integral Chow ring of quotient stacks. January 28, 2014.
17. Tri-College Colloquium Talk, North Dakota State University, Fargo, ND.
Title: Birational Geometry on Deligne-Mumford Stacks. November 15, 2011.
18. Geometry/Topology Seminar, University of Missouri, Columbia, MO.
Title: On the hyperbolicity of nodal quintic surfaces. October 19, 2010.
19. Math/CS Colloquium Series, Concordia College, Moorhead, MN.
Title: An introduction to the Jacobian conjecture. October 12, 2010.
20. Séminaire ATG, Laboratoire J.A.Dieudonné, Nice, France.
Title: Lanneau de Chow pour les champs quotients. May 20, 2010.
21. Sémin. Algèbre, Géom. Algébrique, Top. Algébrique, Inst. de Math. et de Mod., Montpellier, France.
Title: Champs des modules des courbes stables avec n noeuds. May 6, 2010
22. Séminaire de Géométrie Algébrique, Laboratoire Paul Painlevé, Lille, France.
Title: L'anneau de Chow pour le champ des revêtements cycliques de la droite projective. May 5, 2010.
23. Freiburg-Nancy-Strasbourg Joint Seminar in Algebraic and Complex Geometry, IRMA, Strasbourg, France. Title: Intersection rings of stacks of cyclic covers. April 19, 2010.
24. Seminar of Algebra and Geometry, UFR de Mathématiques Institut Fourier, Grenoble, France.
Title: L'anneau de Chow pour le champ des revêtements cycliques de la droite projective. Mar 15, 2010.
25. Five Lectures on the paper by J.Cheng and H.Tseng: Cone Theorem via Deligne-Mumford Stacks, IRMA, Strasbourg, France. March 2010.
26. Geometry Seminar, Texas A&M University Department of Mathematics, College Station TX.
Title: Equivariant Intersection Rings. January 7, 2010.
27. Mathematics Colloquium, North Dakota State University Department of Mathematics, Fargo ND.
Title: Equivariant Intersection Theory. November 10, 2009.
28. Séminaire de Géométrie Algébrique, IRMA, Strasbourg, France.
Title: Equivariant Intersection Rings with Integer Coefficients. September 17, 2009.
29. Algebraic Geometry Seminar, The Ohio State University Department of Mathematics, Columbus OH.
Title: The 1-Skeleton of Moduli Stacks of Curves. April 28, 2009.
30. Algebraic Geometry Day, University of Missouri Department of Mathematics, Columbia MO.
Title: The Integral Chow Ring of the Moduli Space of Hyperelliptic Curves. May 3, 2008.

Contributed Talks

1. MAA-NCS Fall 2016 Meeting, University of Minnesota, Twin Cities Minneapolis, MN.
Title: Necklaces. Joint work with Sayel Ali. October 15, 2016.
2. MAA-NCS Spring 2015 Meeting, Winona State University, Winona, MN.
Title: Frames. Joint work with Sayel Ali. April 25, 2015.
3. MAA-NCS Fall 2014 Meeting, NDSU, Fargo, ND.
Title: Arithmetic Sets in Groups. September 26, 2014.
4. MAA Math Fest, Hartford, CT.
Title: Möbius Transformations Fixing Finite Sets of Points. August 1, 2013.
5. MAA-NCS Spring 2013 Meeting, Gustavus Adolphus College, Saint Peter, MN.
Title: Generalized Peano Functions. April 26, 2013
6. Math Club, Minnesota State University, Moorhead, MN.
Title: The Origin of the Complex Numbers and the General Solution to Cubic Polynomials.
November 17, 2011.
7. Math Club, Minnesota State University, Moorhead, MN.
Title: Challenging Primes. March 22, 2011.
8. Géométrie Algébrique en Liberté, Lorentz Center, Leiden, Netherlands.
Title: Integral Equivariant Intersection Theory. June 12, 2009.
9. Days of Algebraic Geometry and Related Topics, Levico Terme, Trento, Italy.
Title: L'anello di intersezione dello stack di curve iperellittiche lisce di genere pari. May 29, 2008.

Recent Conferences Attended

- June 4-7, 2018 A Tale of Algebra and Geometry, Pisa, Italy.
Oct 14-15, 2016 MAA-NCS Fall 2016 Meeting, Twin Cities Minneapolis, MN.
June 6-10, 2016 The Hodge Conjecture: State of the Art, Levico Terme (Trento), Italy.
Oct 4-6, 2015 International Learning Assistant Workshop, Boulder, CO.
Jul 27-31, 2015 AMS Summer Institute in Algebraic Geometry, Salt Lake City, UT.
Apr 24-25, 2015 MAA-NCS Spring 2015 Meeting, Winona, MN.

Courses Taught

- **At Colorado College, Colorado Springs.** Fall 2017, Spring 2018.
Spring 2018, Block 7: Ordinary Differential Equations.
Fall 2017, Block 4: Calculus III.
- **At Colorado State University, Fort Collins.** Fall 2017- Spring 2018.
Weekly Lectures on Algebraic Stacks during the period from October 2017 till April 2018.
This series of lectures is also included under "Invited Talks".
- **At Minnesota State University Moorhead.** Fall 2010 -Present.
Undergraduate Curriculum Courses: Elementary Algebra, Intermediate Algebra, Introduction to Mathematics, College Algebra, Pre-Calculus, Computer Calculus, Business Calculus, Introduction to Probability and Statistics, Calculus I, Calculus II, Multivariable/Vector Calculus, Mathematical Modeling, Foundations of Geometry, Introduction to Linear Algebra, Discrete Mathematics, Differential Equations, Intermediate Analysis I, Abstract Algebra I, Mathematics Seminars.
Independent Studies: Complex Analysis, Nonlinear Differential Equations, Number Theory, Differential Geometry, Topology, Abstract Algebra II, and Galois Theory.
Online Graduate Course: Abstract Algebra and Galois Theory.

- **At the University of Missouri-Columbia.** Fall 2005 - Fall 2008.
Calculus for social sciences students, Calculus for business students, Finite Math for business students, Finite Math, Discrete Math Structures, Calculus II, Higher Algebra for students majoring in mathematics education, Elementary Italian.
- **At the University of Pisa, Italy.** Fall 2004.
Recitations in Linear Algebra for engineering students.

Educational Activities

- | | |
|-----------------|---|
| 2011-present | Team advisor for the Mathematical Contest in Modeling, organized by COMAP. Training students for the MAA-NCS team competition, and PUTNAM competition. |
| 1997-2005 | Trainer for selected high school students, who have risen to the top of the Italian Mathematics Competition, preparing them for the International Mathematical Olympiads. |
| Sep 11-17, 2004 | Seminar speaker and tutor at Pre-University workshop for selected high school students organized by Scuola Normale Superiore, S. Miniato (Pisa) Italy. |

Experience in Teaching Technologies

Educational Technologies: Blackboard, Canvas, D2L, Kaltura MediaSpace.

Online Learning Systems: MyMathLab, MathXL, Webassign.

Technical Computing Systems: Mathematica, Maple.

Online Meeting Platform: Zoom.

Certificate of Completion: Independent Applying the Quality Matters Rubric.

Service

- | | |
|-------------------------|--|
| 2014-present | Refereed articles for Journal of Algebraic Geometry, International Mathematics Research Notices, and Anais da Academia Brasileira de Ciências. |
| 2014-2017 | Advisor of the Golden Key Chapter at MSUM. |
| 2012-2017 | Member of the Faculty Development Committee. Chair Fall 2013 - Fall 2015. |
| 2012-present | Internship Programs Coordinator for the Math Department. |
| 2012-present | Coordinator of the Math Tutoring Room. |
| Spring 2011-Spring 2014 | Contribution to the Tri-College Math Competition with problems and grading process. |
| Spring 2011-Spring 2016 | Student Academic Conference at MSUM: supervising students for presentations and chairing sessions. |
| Spring 2011-Fall2016 | Participation in the fund raising activity for the Math Club "Pie Your Professor". |