LAURA G. DE MARCO

Department of Mathematics
Northwestern University
2033 Sheridan Road
Evanston, IL 60208-2730
demarco@northwestern.edu

EDUCATION

Harvard University, Cambridge, MA
      Ph.D. in Mathematics, June 2002
      Thesis advisor: Curtis T. McMullen
University of California, Berkeley, CA
      M.A. in Mathematics, 1998
University of Virginia, Charlottesville, VA
      B.A. in Mathematics and Physics, 1996

EMPLOYMENT

Henry S. Noyes Professor of Mathematics, Northwestern University September 2019 – present
Professor, Northwestern University, September 2014 – present
Professor, University of Illinois at Chicago, August 2012 – August 2014
Associate Professor, University of Illinois at Chicago, August 2009 – August 2012
Assistant Professor, University of Illinois at Chicago, August 2007 – August 2009
Assistant Professor, University of Chicago, September 2005 – August 2007
L. E. Dickson Instructor, University of Chicago, September 2002 – August 2005

PRIMARY RESEARCH INTERESTS

Dynamical systems, Complex analysis, Arithmetic geometry. I am mainly focused on the dynamics of rational maps $f : \mathbb{P}^1(\mathbb{C}) \to \mathbb{P}^1(\mathbb{C})$ and their moduli spaces, studied with a combination of complex-analytic and algebraic techniques.

GRANTS and AWARDS

PI, NSF Research Grant, 2019–2022
Invited Speaker, International Congress of Mathematicians, 2018
Satter Prize, American Mathematical Society, 2017
PI, NSF Research Grant, 2016–2019
Simons Foundation Fellowship, 2015–2016; Visiting Professor, University of Michigan (Fall
      2015), Visiting Professor, Stony Brook University (Spring 2016)
PI, NSF Research Grant, 2013–2016
Kreeger Wolf Distinguished Visiting Professor, Northwestern University, 2013–2014
Fellow of the American Mathematical Society, 2012
NSF Career Award, 2008–2013
Sloan Foundation Research Fellowship, 2008–2010
UIC WISEST Start-up Grant, 2007–2011
PI, NSF Research Grant, 2006–2009
NSF Postdoctoral Fellowship, University of Chicago, 2003–2006

Grants awarded for conferences and research programs

Simons Symposium Series in Mathematics, Simons Foundation, 2019–2023

Clay Mathematics Institute, for *Circle at Infinity*, honoring McMullen, 2020

Workshop, Mathematisches Forschungsinstitut Oberwolfach, 2020

AIM Workshop, American Institute of Mathematics, 2020

PI, Midwest Dynamical Systems Conference Grant, NSF, 2019–2021

BIRS Oaxaca workshop, Banff International Research Station, 2017

AIM SQuaRE program, American Institute of Mathematics, 2016–2019

PI, Midwest Dynamical Systems Conference Grant, NSF, 2016–2019

Co-PI, GROW 2017: Strengthening the Mathematical Workforce, a conference for undergraduate women in mathematics, NSF, 2017

Co-PI, GROW: Strengthening the Mathematical Workforce, a conference for undergraduate women in mathematics, NSF, 2016

Co-PI, NSF Research & Training Grant at Northwestern, 2015–2020

Co-PI, NSF Research & Training Grant at UIC, 2013–2014

INVITED LECTURES

UPCOMING

Ziwet Lecture Series, University of Michigan, February 2020

Circle at Infinity, a conference to celebrate the mathematics of C. T. McMullen, Harvard University, May 2020

Conference on Dynamical Systems, ICTP Trieste, Italy, October 2020

RECENT (since 2014 only)

Colloquium, Purdue University, 2019

Earle Raymond Hedrick Lecture Series, MAA MathFest, 2019

Myhill Lecture Series, University of Buffalo, 2019

Grosswald Lecture Series, Temple University, 2019

Analytic Low-Dimensional Dynamics, honoring Lyubich, Fields Institute, Toronto, 2019

Hayden-Howard Lecture, University of Kentucky, 2019

Colloquium, Harvard University, 2019

Colloquium, University of Chicago, 2019

Yormark Distinguished Lecture, Stanford University, 2019

Sue Geller Undergraduate Lecture, Texas A&M University, 2019

Dynamical Systems Session, International Congress of Mathematicians, Brazil, 2018

Conference on Diophantine Approximation, CIRM, Marseille, France, 2018

Plenary Lecture, Canadian Mathematical Society, Vancouver, 2018

Number Theory Seminar, University of Maryland, 2018

Dynamics Seminar, University of Maryland, 2018

Dynamics, Topology, and Numbers Conference, Max Planck Inst, Bonn, Germany, 2018

Number Theory Days, Conference, University of Basel, Switzerland, 2018

Plenary Lecture, British Mathematics Colloquium, Scotland, 2018

Probability, Analysis, and Dynamics Conference, Bristol, England, 2018

Colloquium, Queen's University, Canada, 2018

Dynamical Systems Seminar, University of Toronto, Canada, 2018

Harry E. Valentine Lecture, Kansas State University, 2018

Dynamical Systems Seminar, University of Chicago, 2018

Mordell Lecture, University of Cambridge, England, 2017

Distinguished Undergraduate Lecture, Michigan State University, 2017

Colloquium, Michigan State University, 2017

Lecture series, Families of algebraic dynamical systems, Rennes, France, 2017
Plenary Lecture, Journées Arithmetiques, Caen, France, 2017
Special lecture, Summer Northwestern Analysis Program, 2017
Plenary Lecture, MAA of Illinois, 100th Anniversary Conference, 2017
Geometry and Dynamics Seminar, Harvard University, 2017
Chicago Action Now, Dynamics Seminar, 2017
Heights and Applications to Unlikely Intersections, Fields Institute, Canada, 2017
Colloquium, Ohio State University, 2016
Colloquium, University of Waterloo, Canada, 2016
Five College Number Theory Seminar, Amherst College, 2016
Undergraduate Colloquium, Amherst College, 2016
Number Theory Seminar, Princeton University, 2016
Mini-course on Equidistribution, Stony Brook University, 2016
Special Session in Complex Dynamics, AMS Meeting, Stony Brook University, 2016
Colloquium, Columbia University, 2016
Colloquium, Yale University, 2016
Colloquium, Stony Brook University, 2016
Colloquium, Rutgers University, 2016
Number Theory Seminar, CUNY Graduate Center, 2016
Dynamics Seminar, Stony Brook University, 2016
RTG Workshop in Arithmetic Dynamics, University of Michigan, 2015
Complex Dynamics and Geometry Seminar, University of Michigan, 2015
GROW: A program for undergraduate women in mathematics, Northwestern, 2015
Non-Archimedean Analytic Geometry Conference, French Polynesia, 2015
Arithmetic 2015, Conference in honor of J. Silverman, Brown University, 2015
Invited Address, EquaDiff 2015, France, 2015
Geometries in Action, conference in honor of E. Ghys, France, 2015
Non-Archimedean Geometry Conference, Univ. of Michigan, 2015
IMS XXV: Low-Dimensional Dynamics, Stony Brook, 2015
Colloquium, Argonne National Laboratory, Physics Division, 2015
Mini-course Lectures, KAWA Workshop, Pisa, Italy, 2015
Plenary Lecture, Midwest Women in Mathematics Symposium, Chicago, 2015
Seminar, Harvard University, 2015
Dynamics and Geometry Colloquium, Penn State, 2015
Topology, Arithmetic, and Dynamics Seminar, George Mason Univeristy, 2015
Tech Topology Conference, Georgia Tech, Atlanta, 2014
Number Theory Seminar, University of Wisconsin, Madison, 2014
Mini-course Lectures, Workshop in Holomorphic Dynamics, Denmark, 2014
Plenary Lecture, International Congress of Women Mathematicians, Korea, 2014
Dynamical Systems Seminar, University of Toronto, Canada, 2014
2nd ERC Research Period in Diophantine Geometry, Cetraro, Italy, 2014
Keynote Lecture, US State Department, Banquet for Math Olympiad winners, 2014
Chelluri Public Lecture, Cornell University, 2014
Dynamical Systems Seminar, Cornell University, 2014
Bloomington Geometry Workshop, Indiana University, 2014
Colloquium, Zhejiang University, China, 2014
AMS Special Session, Joint Math Meetings, Baltimore, 2014
Public Lecture, Kreeger Wolf Foundation, Northwestern University, 2014

STUDENT AND POSTDOC SUPERVISION

GRADUATE STUDENTS
Holly Krieger, PhD 2013
Paul Reschke, PhD 2013
Hexi Ye, PhD 2013
Cara Mullen, PhD 2017
Nicole Looper, PhD 2018
Current PhD students: Khashayar Filom, Signe Jensen, Shuyi Weng

Louie Angelo Lee, MA 2016
Corinna Wendisch, MA 2016

POSTDOCS
Chong Gyu Lee, 2010–2012
Xiaoguang Wang, Spring 2013
Jan-Li Lin, 2014–2016
Sara Lapan, 2013–2016
Kenneth Jacobs, 2016–2019
N. Myrto Mavraki, 2018–2019
Current postdocs: Eric Chang, Daniel Cuzzocreo

UNDERGRADUATE RESEARCH PROJECTS
Yuxi Han, Summer 2017
Shikhar Shah, Summer 2013, Fall 2013
Kelsey DiPietro, Rupa Mirmara, Shikhar Shah, Spring 2013
Kelsey DiPietro, Summer Hasan, Fall 2012
Aaron Schiff, Summers 2008, 2009, 2010
Andrew Duffy, Archit Joshipura, Fall 2007

TEACHING (since 2002)

NORTHWESTERN
Multivariable Calculus, Winter 2019
MENU (Honors) Multivariable Calculus, Winter 2018
MENU (Honors) Linear Algebra, Fall 2016
Linear Algebra, Winter 2015
Chaotic Dynamical Systems, for undergraduates, Fall 2013, Fall 2014, Fall 2018, Fall 2019
Graduate Complex Analysis, Spring 2015
Graduate Dynamical Systems and Special Topics, Winter 2014, Spring 2014, Spring 2017, Spring 2018
Graduate Topics in Geometry (Riemann Surfaces) Winter 2020

UNIVERSITY OF ILLINOIS AT CHICAGO
Graduate Complex Analysis, 2009, 2013
Higher Geometry for Teachers (Masters program), 2010, 2012
Complex Manifolds, 2011
Calculus 1, 2010, 2011
Advanced Topics in Analysis: Complex Dynamics, 2010
Introduction to Proofs, 2008
Calculus 3, 2007

UNIVERSITY OF CHICAGO
Honors Calculus, 2003, 2005, 2006, 2007

Undergraduate Complex Analysis, 2002, 2005
Undergraduate Analysis in $\mathbb{R}^n$, 2005
Fractals and Dimension, Summer REU course, 2006

RECENT SERVICE AND ACTIVITIES

EDITORIAL POSITIONS
Editorial Board, Journal of the American Mathematical Society (JAMS), 2018–present
Editorial Board, Journal of Modern Dynamics, 2014–present
Editorial Board, AMS Journal of Conformal Geometry and Dynamics, 2013–2020

CONFERENCE ORGANIZATION (since 2014)
Organizer, Simons Symposium Series in Arithmetic and Algebraic Dynamics, 2019–2023
Scientific Committee, CIMPA School in Complex Analysis, Uzbekistan, April 2021
Organizer, Midwest Dynamical Systems Conference, Northwestern, November 2020
Organizer, Workshop, Mathematisches Forschungsinstitut Oberwolfach, April 2020
Organizer, Circle at Infinity, Conference in honor of McMullen's mathematics, May 2020
Scientific Committee, Iberoamerican Congress in Geometry, Mexico, June 2020
Organizer, Workshop, American Institute of Mathematics, July 2020
Organizer, Dynamics Days at Northwestern, 2019–2020
Organizer, Complex and Arithmetic Dynamics workshop, May 2018
Organizer, Chicago Action Now Dynamics Day, May 2018
Scientific Committee, Iberoamerican Congress in Geometry, Spain, January 2018
Organizer, Midwest Dynamical Systems Conference, Northwestern, November 2017
Organizer, BIRS Oaxaca Workshop, November 2017
Organizer, GROW 2017, conference for undergraduate women in mathematics, October 2017
Organizer, GROW II, conference for undergraduate women in mathematics, October 2016
Organizer, Summit Meeting on Gender Imbalance, Northwestern, October 2016
Organizer, Bifurcations Mini-workshop, Ann Arbor, MI, November 2015
Organizer, GROW, conference for undergraduate women in mathematics, October 2015
Scientific Committee, Iberoamerican Congress in Geometry, CUNY, May 2014
Scientific Committee, Midwest Dynamical Systems Conference, 2013–2016

NORTHWESTERN UNIVERSITY (since 2014)
Math Department: Postdoc Hiring Committee, 2014–2015, 2018–2019, 2019–2020
   Committee Chair, 2018–2019
Weinberg College: Tenure Committee, 2016–2017, 2018–2020
Math Department: Special Lectures Committee, 2014–2015, 2015–2016, 2018–2019
Math Department: Budget Committee, 2015, 2018
Math Department: Organizer, Emphasis Year in Dynamical Systems, 2017–2018, 2019–2020
Math Department: Colloquium Committee, 2017–2018
Math Department: Tenure-track Hiring Committee
   Committee Chair, 2016–2017
Math Department: Teaching-track Hiring Committee
   Committee Chair, 2016–2017
Undergraduate: Math Club lecture, 2014, 2018
Women's Center: Panel on Surviving and Thriving in Academia, 2015
Math Department: Graduate Student Seminar, 2015
Math Department: Colloquium for Prospective Graduate Students, 2015

FOR THE GENERAL MATHEMATICAL COMMUNITY (since 2014)
External Reviewer, CUNY Graduate Center, April 2019

Selection Committee, Zhang Prize in Dynamical Systems, 2019
External Reviewer, Duke University Mathematics Department, April 2018
AMS Editorial Boards Committee, elected position, 2016–2019
      Committee Chair, 2017
AWM Executive Committee, elected position, 2016–2018
External Examiner, PhD thesis of Sébastien Biebler, Univ. Paris Est, July 2018
AMS Committee on Publications, 2017
External Examiner, Habilitation of Gabriel Vigny, Univ. Picardie Jules Verne, Dec 2017
External Examiner, PhD thesis of Jonguk Yang, University of Toronto, August 2017
AWM/AMS Selection Committee for Noether Lecture, 2014–2017
      Committee Chair, 2015–2016
AMS Central Section Program Committee, 2014–2016
      Committee Chair, Jan.2015–Dec.2016
External Reviewer for NSF site visit, Committee Chair, Institute for Advanced Study, Princeton, NJ, October 2016
External Examiner, PhD thesis of Joseph Adams, Stony Brook University, May 2016
External Reviewer, Notre Dame Mathematics Department, November 2014
Grant/proposal reviews for the NSF (U.S.A.), BSF (US-Israel), ISF (Israel), NSERC (Canada), FONDECYT (Chile), DFG (Germany).
NSF grant review panels
Member, American Mathematical Society (AMS), Assoc. for Women in Mathematics (AWM)

PUBLICATIONS and PREPRINTS

35. Common preperiodic points for quadratic polynomials, with H. Krieger and H. Ye.
      Preprint, 50 pages.
34. Uniform Manin-Mumford for a family of genus 2 curves, with H. Krieger and H. Ye.
      Submitted for publication, 44 pages.
33. Variation of canonical height and equidistribution, with N. M. Mavraki.
      To appear, *American J. of Math*, 32 pages.
32. Critical orbits and arithmetic equidstribution.
      To appear, *Proceedings of the ICM 2018*, 19 pages.
31. On the postcritical set of a rational map, with S. Koch and C. McMullen.
      To appear, *Math. Ann.*, 20 pages.
30. Rationality of dynamical canonical height, with D. Ghioca.
      To appear, *Ergodic Theory Dynam. Systems*, 33 pages.
29. Bounded height in families of dynamical systems, with D. Ghioca, H. Krieger, K.D. Nguyen, T.J. Tucker, and H. Ye. To appear, *Int. Math. Res. Notices*, 30 pages.
28. Discontinuity of a degenerating escape rate, with Y. Okuyama.
      Conform. Geom. Dyn. **22** (2018), 33–44.
27. Dynamical moduli spaces and elliptic curves (KAWA Lecture Notes).
      Ann. Fac. Sci. Toulouse Math. **27** (2018), 389–420.
26. The classification of polynomial basins of infinity, with K. Pilgrim.
      Ann. Sci. Éc. Norm. Supér. **50** (2017), 799–877.
25. Convex shapes and harmonic caps, with K. Lindsey.
      Arnold Math. J. **3** (2017), 97–117.
24. Bifurcations, intersections, and heights.
      Algebra & Number Theory. **10** (2016), 1031–1056.
23. Degenerations of complex dynamical systems II: Analytic and algebraic stability, with X. Faber, and an Appendix by J. Kiwi. *Math. Annalen.* **365** (2016), 1669–1699.

22. Torsion points and the Lattès family, with X. Wang and H. Ye.
    American J. of Math. **138** (2016), no. 3, 697–732.
21. Bifurcation measures and quadratic rational maps, with X. Wang and H. Ye.
    Proc. of the London Math. Soc. **111** (2015), no. 1, 149–180.
20. Degenerations of complex dynamical systems, with X. Faber.
    Forum of Math. Sigma. **2** (2014) e6, 36 pages.
19. Special curves and postcritically-finite polynomials, with M. Baker.
    Forum of Math. Pi. **1** (2013) e3, 35 pages.
18. The geometry of the critically-periodic curves in the space of cubic polynomials, with
    A. Schiff. *Experimental Mathematics.* **22** (2013), no. 1, 99–111.
17. Combinatorics and topology of the shift locus.
    In *Conformal Dynamics and Hyperbolic Geometry*, AMS Contemporary Math.
    Volume in honor of Linda Keen's birthday, **573** (2012) 35–48.
16. Preperiodic points and unlikely intersections, with M. Baker.
    Duke Math. J. **159** (2011) 1–29.
15. The conformal geometry of billiards.
    Bulletin of the AMS. **48** (2011), no.1, 33–52.
14. Polynomial basins of infinity, with K. Pilgrim.
    Geom. Funct. Anal. **21** (2011) 920–950.
13. Critical heights on the moduli space of polynomials, with K. Pilgrim.
    Advances in Math. **226** (2011) 350–372.
12. Hausdorffization of polynomial twists, with K. Pilgrim.
    Discrete Contin. Dyn. Sys. **29** (2011), no. 4, 1405–1417.
    Special Issue: Trends and Developments in Dynamical Systems, Part III.
11. Enumerating the basins of infinity for cubic polynomials, with A. Schiff.
    J. Difference Equ. Appl., Special Issue to honor Robert Devaney, **16** (2010) 451–461.
10. Axiom A polynomial skew products of $\mathbf{C}^2$ and their postcritical sets, with S. Lynch
    Hruska. *Ergodic Theory Dynam. Systems*, **28** (2008), 1729–1748.
    Erratum, *Ergodic Theory Dynam. Systems*, **31** (2011), 631–636.
9. Trees and the dynamics of polynomials, with C. McMullen.
    Ann. Sci. École Norm. Sup. **41** (2008) 337–383.
8. Finiteness for degenerate polynomials.
    In *Holomorphic Dynamics and Renormalization: A Volume in Honour of J. Milnor's
    75th birthday.* Fields Institute Communications, AMS, **53** (2008) 89–104.
7. Transfinite diameter and the resultant, with R. Rumely.
    J. Reine Angew. Math. **611** (2007) 145–161.
6. The moduli space of quadratic rational maps.
    Journal of the AMS. **20** (2007) 321–355.
5. Iteration at the boundary of the space of rational maps.
    Duke Math. J. **130** (2005) 169–197.
4. Dimension of pluriharmonic measure and polynomial endomorphisms of $\mathbf{C}^n$, with I. Binder.
    International Math. Research Notices. **11** (2003) 613–625.
3. Dynamics of rational maps: Lyapunov exponents, bifurcations, and capacity.
    Math. Annalen. **326** (2003) 43–73.
2. Dynamics of rational maps: A current on the bifurcation locus.
    Math. Research Letters. **8** (2001) 57–66.
1. Stability of H, D, ^{14}N and ^{15}N atoms in solid ammonia above 100K, with A. Brill and
    D. Crabb. *Journal of Chemical Physics.* **108** (1998) 1423–1428.