

Nicholas M^cCleerey

Contact Information	Department of Mathematics, College of Science Purdue University, West Lafayette Mathematical Sciences Building, Office: 748 150 N. University St. West Lafayette, IN 47907	nmccleer@purdue.edu
Research Interests	Kähler geometry, pluripotential theory, m -subharmonic functions, complex algebraic geometry, non-archimedean geometry, non-Kähler geometry, the real and complex Monge-Ampere equation	
Employment	Assistant Professor , Purdue University, West Lafayette, Aug. 2023 – Present Postdoctoral Assistant Professor , University of Michigan, Ann Arbor, Sept. 2020– June 2023	
Education	Northwestern University , Evanston, IL Ph.D., Mathematics Dissertation: “Singularities of Plurisubharmonic Functions and Kähler Geometry” Sept. 2020 Rice University , Houston, TX B.Sc., Mathematics May 2015	
Publications and Preprints	<ul style="list-style-type: none">– <i>Regularity of the solution to a real Monge-Ampère equation on the boundary of a simplex</i> w/ R. Andreasson, J. Hultgren, M. Jonsson, E. Mazzon, preprint, arXiv: 2403.01620, (2024)– <i>The Eigenvalue Problem for the Complex Hessian Operator on m-Pseudoconvex Manifolds</i> w/ J. Chu, Y. Liu, preprint, arXiv: 2402.03098, (2024)– <i>Singularities of the solution to a Monge-Ampère equation on the boundary of the 3-simplex</i> w/ M. Jonsson, N. Patram, B. Scott, preprint, arXiv: 2309.15263, (2023)– <i>Geodesic Rays in the Donaldson–Uhlenbeck–Yau Theorem</i> w/ M. Jonsson, S. Shivaprasad, preprint, arXiv: 2210.09246, (2022)– <i>Tropical and Non-Archimedean Monge-Ampère Equations for a Class of Calabi-Yau Hypersurfaces</i> w/ J. Hultgren, M. Jonsson, E. Mazzon, to appear in <i>Adv. Math.</i>; arXiv: 2208.13697, (2022)– <i>Lelong Numbers of m-subharmonic Functions Along Submanifolds</i> w/ J. Chu, to appear in <i>J. Inst. Math. Jussieu</i>; arXiv: 2204.01963, (2022)– <i>Plurisupported Currents on Compact Kähler Manifolds</i> to appear in <i>IUMJ</i>; arXiv: 2106.12017, (2021)– <i>Fully Non-Linear Degenerate Elliptic Equations in Complex Geometry</i> w/ J. Chu, <i>J. Funct. Anal.</i> 281 (2021), no. 9, Paper No. 109176, 45 pp.	

- *Volume of Perturbations of Pseudoeffective Classes*
Pure Appl. Math. Q., **14** (2018) no. 3-4, pg. 607–616
- $C^{1,1}$ *Regularity of Geodesics of Singular Kähler Metrics*
w/ **J. Chu**, *J. Lond. Math. Soc. (2)* **104** (2021), no. 1, 66–96.
- *Envelopes with Prescribed Singularities*
J. Geom. Anal. **30** (2020), no. 4, 3716–3741.
- *Pluricomplex Green’s functions and Fano manifolds*
w/ **V. Tosatti**, *Épjournal de Géom. Algébrique*, **3** (2019), Art. 9, 15 pp
- *Polar Transform and Local Positivity for Curves*
w/ **J. Xiao**, *Ann. Fac. Sci. Toulouse Math. (6)* **29** (2020), no. 2, 247–269.

Awards

- Best Thesis Award, 2020, Northwestern University

Events Organized

- Geometry and Geometric Analysis Seminar, Purdue University, Fall 2023–Present
- Graduate Student Analysis Seminar, Northwestern University, Fall 2017–Spring 2018

Mentoring

- REU, “Singularities for the Planar Monge-Ampère Equation,” University of Michigan, Ann Arbor, June - Aug. 2023, joint with **Mattias Jonsson**
 - 2 student participants, Ben Scott (U. Chicago), Neil Patram (Georgia Tech.)
- Mentor for the Math Alliance, see webpage for link

Service

- Refereed for *Comm. Pure Appl. Math.*, *Calc. Var. Partial Differ. Equ.*, *Hiroshima Math. J.*, *J. Math. Anal. Appl.*, *Math. Z.*, *Pacific J. Math.*, *Rend. Circ. Mat. Palermo, II. Ser.*
- Reviewed for *Mathematical Reviews*, *zbMATH Open*.

Talks Given

- “Current Trends in Kähler Metrics with Special Curvature Properties,” CRM, Montreal, Jun. 2024
- “PDEs in Complex Geometry,” CRM, Montreal, Apr. 2024
- “Geometry and Geometric Analysis Seminar,” Purdue University, Apr. 2024
- “Analysis Seminar,” University of Indiana, Bloomington, Mar. 2024
- “Informal Geometric Analysis Seminar,” University of Maryland, Mar. 2024
- “PDE Seminar,” Purdue University, Feb. 2024
- “Seminar in Mathematical Modelling and Analysis,” Umeå University, Feb. 2024
- “Geometric PDE session at the CMS Winter Meeting,” Montreal, Dec. 2023
- “Analytic Methods in Complex Geometry,” University of Münster, Aug. 2023
- “Geometry and Geometric Analysis Seminar,” Purdue University, Feb. 2023
- “Differential Geometry Seminar,” University of California, Berkeley, Nov. 2022
- “Algebraic Geometry Seminar,” University of Bayreuth, Jul. 2022
- “Geometric Analysis Seminar at BICMR,” Peking University, Jun. 2022
- “Geometric Analysis Seminar,” McGill University, May 2022
- “Geometric Analysis Seminar,” University of Notre Dame, Apr. 2022

- “Seminar in Geometric Analysis,” The Chinese University of Hong Kong, Apr. 2022
- “Differential Geometry Seminar,” Tsinghua University, Apr. 2022
- “Special Session on Complex Geometry,” AMS Sectional Meeting, Purdue, Mar. 2022
- “Complex Analysis, Dynamics and Geometry,” University of Michigan, Mar. 2022
- “Nonarchimedean Reading Seminar on works of Yang Li,” virtual, Apr. 2021
- “UM Nonarchimedean Reading Seminar,” virtual, Fall 2020
- “Complex Analysis, Dynamics and Geometry,” University of Michigan, Nov. 2019
- “Informal Geometric Analysis Seminar,” University of Maryland, Oct. 2019
- “Seminar on Geometric Complex Analysis,” Graduate School of Mathematics, University of Tokyo, Feb. 2019
- “Geometry, Topology and Dynamics Seminar,” University of Illinois at Chicago, Sep. 2018

Teaching

- MATH 366-061,071: Ordinary Differential Equations, Purdue University, Spring 2024
- MATH 590-001: An Introduction to Topology, University of Michigan, Ann Arbor, Winter 2023
- MATH 285-002: Honors Multivariable & Vector Calculus, University of Michigan, Ann Arbor, Fall 2022
- MATH 116-031: Calculus II, University of Michigan, Ann Arbor, Fall 2022
- MATH 214-001: Applied Linear Algebra, University of Michigan, Ann Arbor, Winter 2022
- MATH 116-035,057: Calculus II, University of Michigan, Ann Arbor, Fall 2021
- MATH 214-006: Applied Linear Algebra, University of Michigan, Ann Arbor, Winter 2021
- MATH 116-031,041: Calculus II, University of Michigan, Ann Arbor, Fall 2020
- TA: MATH 285-1: Accelerated Mathematics for MMSS: First Year, Northwestern, Fall 2018
- TA: MATH 320-1,2: Real Analysis, Northwestern, Fall 2017
- TA: MATH 230: Differential Calculus of Multivariate Functions, Northwestern, Fall 2016
- TA: MATH 320-1: Real Analysis, Northwestern, Fall 2016