Casey Blacker

Personal information

date of birth	19 September 1990
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Research interests

moment maps, bundle gerbes, higher structures in algebra and geometry, quantization, and related topics

Employment

2023 – 2025	**Postdoctoral Research Fellow, George Mason University**
2020 – 2022	EIMI International Postdoc, Saint Petersburg State University
2018 – 2020	CPSF International Exchange Postdoc, East China Normal University

Education

2018	PhD, University of California, Santa Barbara *with* Certificate in College and University Teaching *advised by* Xianzhe Dai
2015	MA, University of California, Santa Barbara
2013	Master of Mathematics (Pure Mathematics, Fast-Track), University of St Andrews undergraduate degree, First Class Honours

Papers and preprints

1. Reduction of L_∞-algebras of observables on multisymplectic manifolds (with A. Miti and L. Ryvkin), Jun 2022. arXiv:2206.03137
2. Reduction of multisymplectic manifolds. *Lett. Math. Phys.*, 111(3):Paper No. 64, 30, 2021
3. Quantization of polysymplectic manifolds. *J. Geom. Phys.*, 145:103480, 2019
4. Polysymplectic reduction and the moduli space of flat connections. *J. Phys. A*, 52(33):335201, 2019
5. First eigenvalue of the p-Laplacian on Kähler manifolds (with S. Seto). *Proc. Amer. Math. Soc.*, 147(5):2197-2206, 2019
6. *The Moduli Space of Flat Connections over Higher Dimensional Manifolds.* ProQuest LLC, Ann Arbor, MI, 2018. Thesis (Ph.D.)–University of California, Santa Barbara

Lecture notes

1. Introduction to Symplectic Geometry
   `https://math.gmu.edu/~cblacke/teaching.html`

Invited talks

7/23	*XII. International Symposium on Quantum Theory and Symmetries*, Czech Technical University
12/23	*Seminarium Theory of Duality*, University of Warsaw
4/22	*Weekly Departmental Seminar*, Tbilisi State University
12/21	*Young Scientists' Congress*, Russian Year of Science and Technology, Sochi
7/21	*Singular Foliations and Related Structures*, Virtual Seminar
11/20	*Geometry and Combinatorics Seminar*, Chebyshev Lab, St Petersburg
9/20	*Workshop on Multisymplectic Geometry*, KU Leuven
12/19	*Super-Riemann Surfaces and Related Topics*, University of Tokyo
11/19	*Workshop on Differential Geometry*, Tongji University
7/19	*Oberseminar Geometrie, Topologie und Analysis*, University of Cologne
12/18	*Postdoc Seminar*, NYU-Shanghai
5/18	*MathConnections 2018*, University of California, Riverside
1/18	*Joint Mathematics Meetings* of the American Mathematical Society and the Mathematical Association of America

Honors and awards

9/18 – 9/20	China Postdoctoral Science Foundation (CPSF) International Exchange Fellowship
11/14	Academic Senate Outstanding Teaching Assistant Award Nominee
9/13 – 9/17	NSF PhD Fellowship with Research Training Group in Geometry–Topology

Conferences organized

7/21	*Young Researchers'* Virtual Multisymplectic Geometry Conference 2021 `https://math.gmu.edu/~cblacke/yrvmgc_21.html`
7/20	*Young Researchers'* Virtual Multisymplectic Geometry Conference 2020 `https://math.gmu.edu/~cblacke/yrvmgc_20.html`

Seminars organized

9/21 – 1/22	SPbU Young Researchers' Seminar
4–6/21	Generalized Complex Geometry Learning Seminar `https://math.gmu.edu/~cblacke/seminar.html`
10–11/20	Virtual Postdoc Seminar

Each of the following seminars was centered on the indicated book:

3–6/17	Classical Mechanics Learning Seminar* *Lectures on Mechanics,* by J. Marsden
1/17	Graduate Geometry Seminar* *A Mathematical Introduction to Conformal Field Theory,* by M. Schottenloher
8–12/15	Graduate Geometry Seminar* *Methods of Classical Mechanics,* by V.I. Arnold
10–12/14	Graduate Geometry Seminar *Characteristic Classes,* by J. Milnor and J. Stasheff

* in collaboration with the Department of Physics

Academic visits

7/19	University of Cologne, with host Prof. George Marinescu
4/22	Ilia State University, Tbilisi, with host Prof. Giorgi Khimshiashvili

Student publications

1.	Logarithmic spirals on surfaces of constant Gaussian curvature (with P. Tsyganenko), May 2023. arXiv:2305.19919. Accepted to *Involve*

Conference proceedings

1.	Algebraic and geometric reduction of multisymplectic manifolds, September 2023. Accepted to *Quantum theory and symmetries (Proceedings of the 12th international symposium)*

Service

8/19 –	Reviewer for *SIGMA*
11/21 –	Grant reviewer for the National Sciences and Engineering Research Council of Canada
9/21 – 2/22	Volunteer mentor at Saint Petersburg public high school No. 564 Taught an evening course with material adapted from *Differential Geometry of Curves and Surfaces*, by M. do Carmo, culminating in two student research projects: 1. *Generalized loxodromes on surfaces of constant Gaussian curvature*, Pavel Tsyganenko 2. *Geodesics on surfaces of revolution with convex profile curves*, Alexander Travin each presented at the Baltiyskiy Science Fair (`https://baltkonkurs.ru`).

Teaching

8–12/23	Probability
9–12/21	Symplectic Geometry*
2–6/20	Symplectic Geometry*
6–7/18	Multivariable Calculus II
8–9/17	Multivariable Calculus I
8–9/16	Differential Equations
6–7/15	Calculus for the Social and Life Sciences

* indicates a graduate course

Teaching assistantships

4–6/18	Multivariable Calculus II
1–3/18	Multivariable Calculus II
9–12/17	Introduction to Higher Mathematics
9–12/16	Calculus I
9–12/15	Linear Algebra
9–12/14	Introduction to Higher Mathematics
9-12/13	Calculus for the Social and Life Sciences