

Xuemiao Chen

CONTACT INFORMATION

Email: x67chen@uwaterloo.ca

RESEARCH INTERESTS

Complex algebraic and differential geometry
Gauge theory particularly on Yang-Mills connections

EMPLOYMENT

University of Waterloo 2022-
Assistant Professor
University of Maryland, College Park 2019-2022
Brin Postdoctoral Fellow. Mentor: Richard Wentworth.

EDUCATION

Stony Brook University 2013-2019
Ph.D. in pure Mathematics. Advisor: Song Sun.
University of Science and Technology of China 2009-2013
School of the Gifted Young (00)

VISITS

University of California, Berkeley 2018-2019
Visiting Student Research Scholar.

PUBLICATIONS & PREPRINTS

Bubbling of rank two bundles over surfaces
[arXiv]

Admissible Hermitian-Yang-Mills connections over normal varieties
[Math. Ann. (2025)] [arXiv]

On Vafa-Witten equations over Kähler manifolds
[J. Reine. Angew. Math. (2024)] [arXiv]

Nonabelian Hodge correspondence for balanced Hermitian metrics of Hodge-Riemann type
(with Richard Wentworth)
[[Math. Res. Lett. (2024)] [arXiv]

A Donaldson-Uhlenbeck-Yau theorem for normal varieties and semistable bundles on degenerating families (with Richard Wentworth)
[Math. Ann. (2023)] [arXiv]

Compactness for Ω -Yang-Mills connections (with Richard Wentworth)
[Cal.Var.PDE (2022)] [arXiv]

Reflexive sheaves, Hermitian-Yang-Mills connections, and tangent cones (with Song Sun)
[Invent. Math. (2021)] [arXiv]

Analytic tangent cones of admissible Hermitian-Yang-Mills connections (with Song Sun)
[Geometry & Topology (2021)] [arXiv]

Singularities of Hermitian-Yang-Mills connections and the Harder-Narasimhan-Seshadri filtration (with Song Sun)
[Duke Math. J. (2020)] [arXiv]

Algebraic tangent cones of reflexive sheaves (with Song Sun)
[IMRN (2018)] [arXiv]

INVITED TALKS

New developments in Kobayashi-Hitchin correspondence and Higgs bundles
Osaka Metropolitan University, August 2024;
Aarhus Complex Geometry Workshop, June 2024;
Geometry and Topology Seminar CIRGET, April 2024;
Geometry and Topology Seminar McMaster University, April 2024;
Geometric Analysis Seminar, University of Oregon, April 2023;
Complex Geometry and Moduli Space CMS winter meeting Toronto, Dec 2022
Geometry and Topology Seminar McMaster University, Nov 2022
Geometric Analysis Colloquium Fields Institute, October 2022
Differential geometry and geometric analysis seminar Princeton University, October 2021
Special Holonomy: Progress and Open Problems 2021 Simons Center, Sony Brook University, September 2021;
GAP seminar University of Science and Technology of China, August, 2021
Special geometric analysis talk, University of California, Berkeley, August, 2021
OLGA 2021 Oxford-London Gauge Assembly, June 2021;
Differential Geometry and Complex Analysis seminar, University of Florence, April 2021;
Informal geometric analysis seminar, University of Maryland, March 2021;
Complex Geometry Seminar organized by Ya Deng etc, November 2020;
AMS Fall Eastern Virtual Sectional Meeting, October 3-4, 2020;
Geometry-Topology seminar, University of Maryland, October 2019;
Differential Geometry seminar, University of California, Berkeley, November 2018;
Geometric Analysis seminar, University of Oregon, May 2018;
Gauge theory and special holonomy, Imperial College London, January 2018;
Differential geometric analysis seminar, University of Science and Technology of China, July 2017.

RESEARCH GRANTS

NSERC Discovery Grant (2023-2028): \$160,000 (\$32,000 per year)
NSERC Discovery Launch Supplements (2023-2024): \$12,500
UWaterloo Start-up grant (2022-2027): \$60,000

AWARDS AND FELLOWSHIPS

Funded as a graduate student by Simons Collaboration on Special Holonomy in Geometry, Analysis, and Physics starting in June, 2017 - June 2019;
Summer Research Fund, Stony Brook University, 2015&2016&2017;
The National Undergraduate Scholarship, University of Science and Technology of China, 2012.
National Encouragement Scholarship, University of Science and Technology of China, 2010&2011
Xianzi Zeng Scholarship 2010-2012.

TEACHING

University of Waterloo, 2022-

Instructor: Pmath 465/665 smooth manifolds, Fall 2022; Pmath 863, Introduction to Lie groups and Lie algebras Winter 2023; Pmath 965-Selected topics on Riemann surfaces, Fall 2023; Math 148-Calculus II (advanced), Winter 2024; Math 135, Algebra for Honours Mathematics, Fall 2024. Pmath 352, Complex analysis, Spring 2025; Pmath 464/764, Introduction to Algebraic Geometry, Spring 2025; Pmath 450/650, Measure Theory.

University of Maryland, 2019-2022

Instructor: Differential equations for scientists and engineers (honor), Spring 2020/Spring 2021; Calculus I, Spring 2020; Linear algebra for scientists and engineers (honor), Fall 2020; Complex Variables, Fall 2021, Spring 2022

Stony Brook University, 2013-2018:

Instructor: Calculus III with applications, Summer 2015; Introduction to linear algebra, Summer 2014; Calculus C, Summer 2014;

Teaching Assistant: Calculus I (Advanced), Fall 2017; Calculus II (Advanced), Fall 2016; Calculus A, Spring 2016; Calculus A, Fall 2015; Calculus II (Advanced), Spring 2015; Calculus I (Advanced), Fall 2015.

Grader: Differential Geometry of curves and surfaces, Spring 2017; Euclidean and non-Euclidean geometry, Spring 2017; Topology and Geometry II, Fall 2015; Calculus C, Spring 2014; Introduction to linear algebra, Fall 2013.

SUPERVISION

University of Waterloo 2022-

Postdoc fellows ¹

Jesse Huang (PhD UIUC), 2024-2026

Roberto Albesiano (PhD Stony Brook), 2024-2026

Aleksandar Milivojevic (PhD Stony Brook), 2023–2025, William T. Tutte Postdoc

Lucía Martín Merchan (PhD Universidad de Málaga), 2022–2024 (Postdoc at Humboldt–Berlin)

Michael Albanese (PhD Stony Brook), 2022–2024 (Lecturer at the University of Adelaide)

Master students

Daniel Samuel Zeldin Clark 2022–2023

Ravi Mudaliar 2022-2023 (PHD program at University of Houston, Fall 2024)

Undergraduate students

Alexander Pawelko (MURA) Fall 2025 (Co-supervised with Spiro Karigiannis)

Simon Baken (NSERC) Fall 2025

Lily Zhou (NSERC) Spring 2025

Derek Wu (MURA) Fall 2023 (Graduate program at University of Toronto, Fall 2024)

Sam Brinkerhoff (MURA) Spring 2023 (Graduate program at University of Bonn, Fall 2024)

¹Jointly with Uwaterloo Geometry and Topology group

SERVICE

University of Waterloo 2022-

PHD qualification exam committee 2024-

Undergraduate committee 2023-

Graduate Committee 2025-

Graduate Admission Committee 2025-

PHD committee for

Faisal Romshoo 2024-

Amanda Maria Petcu 2023-

Robert Cornea 2023-

Paul Cusson 2023-

Second Master Thesis Reader

Facundo Camano 2024-2025

Faisal Romshoo 2023-2024

Jacques Van Wyk 2022-2023

Seminar organization

Co-organize Uwaterloo Differential Geometry working seminar 2022-

Co-organize Uwaterloo Geometry and Topology seminar 2022-

Co-organize Fields institute geometric analysis colloquium 2023, 2025-

University of Maryland 2019-2022

NSF Panelist 2022

Co-organizer of *Informal geometric analysis seminar* 2021

Referee for journals:

Annali di Matematica Pura ed Applicata

Analysis&PDE

Calculations and variations of partial differential equations

Geometry&Topology

Geometriae Dedicata

International Journal of Mathematics

Journal of Differential Geometry

Journal of Geometric Analysis

Journal of the Institute of Mathematics of Jussieu

Math Annalen

Pure and Applied Mathematics Quarterly

The Quarterly Journal of Mathematics

Transactions of American Mathematical Society