

Bingyuan Liu

CONTACT INFORMATION	Department of Mathematics The University of Texas Rio Grande Valley TX 78539, USA	bingyuan.liu@utrgv.edu liubingyuan123456.github.io/bingyuanliu/
RESEARCH INTERESTS	PDEs, Several Complex Variables, Complex/Algebraic Geometry, Sub-Riemannian Geometry, Dynamical Systems and Applied Mathematics	
APPOINTMENTS	2020-present	Assistant Professor, the University of Texas Rio Grande Valley
	2018-2020	Visiting Assistant Professor, University of Arkansas Fayetteville
	2015-2018	Visiting Assistant Professor, University of California Riverside
EDUCATION	Washington University Ph.D. in Mathematics, August 2015 <ul style="list-style-type: none">Dissertation Topic: Several complex variables, complex geometry and their applications.Advisor: Steven Krantz M.A. in Mathematics, May 2011	
	Royal Institute of Technology (KTH) M.S. in Mathematics, May 2009 <ul style="list-style-type: none">Dissertation Topic: Classical inequalities for the discrete spectrum of Schrödinger operators.Advisor: Ari Laptev	
	Beijing University of Technology (Special Class for the Gifted Students) B.E. in Computer Science, May 2006	
VISITING POSITIONS	Aug.-Sept. 2016	National Autonomous University of Mexico (Cuernavaca)
	May-June 2015	National Autonomous University of Mexico (Cuernavaca)
	June 2015	Autonomous University of Yucatan, Mexico
AWARDS AND HONORS	2026	IHES Invited Researcher
	2025-2027	National Science Foundation, LEAPS-MPS-2532088, PI, \$ 244,053
	2022	UTRGV Faculty Seed Research Grants, PI
	2022	AMS-NSF Travel Grant
	2022, 2025	Faculty Travel Grant for the JMM
	2019	MSRI Travel fund: Recent developments in microlocal analysis Workshop
PUBLICATIONS	<i>General soliton solutions to the coupled Hirota equation via the Kadomtsev-Petviashvili reduction.</i> Joint with Changyan Shi and Baofeng Feng. Chaos Solit. Fractals. Accepted (2025).	
	<i>Generalization of Morrey–Kohn–Hörmander’s formula.</i> J. Geom. Anal. 35 (2025), no. 2, Paper No. 49, 13 pp.	
	<i>On the Hörmander’s estimate.</i> J. Math. Anal. Appl. 550 (2025), no. 2, Paper No. 129549, 18 pp.	

On the manifolds with noncompact automorphism groups. Complex Anal. Oper. Theory **18** (2024), no. 8, Paper No. 172, 8 pp.

Diederich-Fornæss index and global regularity in the $\bar{\partial}$ -Neumann problem: domains with comparable Levi eigenvalues. Joint with Emil Straube. Trans. Amer. Math. Soc. **378** (2025), no. 8, 5403-5421.

The $\bar{\partial}$ -Neumann problem and boundary integral equations. Internat. J. Math. **34** (2023), no.1, Paper No. 2350001, 19 pp.

Ground state solution of the thin film epitaxy equation. Joint with Yu Su and Zhaosheng Feng. J. Math. Anal. Appl. **503** (2021), no. 2, Paper No. 125357, 28 pp.

The Diederich-Fornæss index and the regularities on the $\bar{\partial}$ -Neumann problem. Indiana U. Math. J. **71** (2022), no. 4, 1371-1395.

The complex Green operator with Sobolev estimates up to a finite order. Joint with Andrew Raich. Int. J. Math. **31** (2020), no. 14, 2050122.

The Green's function method on the Riemann mapping theorem. Handbook of complex variables (2021).

The $\bar{\partial}$ -Neumann operator with the Sobolev norm of integer orders. Joint with Phillip Harrington. Comm. Partial Differential Equations **45** (2020), no. 10, 1435-1450.

The Diederich-Fornæss index II: for domains of trivial index. Adv. Math. **344** (2019), 289-310.

The Diederich-Fornæss index I: for domains of non-trivial index. Adv. Math. **353** (2019), 776-801.

Geometric Analysis on the Diederich-Fornæss Index. Joint with Steven Krantz and Marco Peloso. J. Korean Math. Soc. **55** (2018), no. 4, 897 - 921.

Two applications of the Schwarz lemma. Pacific J. Math. **296** (2018), no. 1, 141 - 153.

On the domains with noncompact automorphism groups. J. Math. Anal. Appl. **465** (2017), no. 2, 903 - 911.

The intrinsic geometry on bounded pseudoconvex domains. J. Geom. Anal. **28** (2018), no. 2, 1728 - 1748.

The limit set for discrete complex hyperbolic groups. Joint with Angel Cano and Marlon López. Indiana U. Math. J. **66** (2017), no. 3, 927 - 948.

Analysis of orbit accumulation points and the Greene-Krantz conjecture. J. Geom. Anal. **27** (2017), no. 1,

Finite type domains with hyperbolic orbit accumulation points. J. Math. Anal. Appl. **415** (2014), no. 1, 314 - 324.

Several complex variables, complex geometry and their applications. PhD thesis (2015).

Classical inequalities for the discrete spectrum of Schrödinger operators. Preprint

(2009).

TEACHING AND
MENTORING
EXPERIENCE

Mentoring:

Asha Barua “Cardinality Of Irrational Numbers In The Cantor Set”.

Co-advisor of Ph.D student: Tatiyana Altecor, Changyan Shi.

Teaching:

UTRGV	Graduate Complex Analysis, Analysis, Graduate Analysis, Calculus, Math. for Engineering, Modern Geometry
UARK	Calculus, Diff. Eq., Math. for Business and Social Sciences
UCR	Calculus, Complex Variables

INVITED
TALKS

Joint Mathematics Meetings, Seattle, USA. (January 2025)

Seminar in University of Wisconsin, Madison, USA. (November 2024)

Prairie Analysis Seminar 2024, The University of Kansas, Lawrence, USA. (October 2024)

AMS Fall Eastern Sectional Meeting, University at Albany, Albany, USA. (October 2024)

Seminar, Sun Yat-Sen University (Zhuhai), China. (August 2024)

Junior Workshop in Several Complex Variables, Madison, WI. (June 2024)

2023 Taipei conference on complex geometry, Taipei. (December 2023)

Keynote Speaker, 6th International Conference on Pure and Applied Math., Pakistan. (December 2023)

Seminar, Gothenburg, Sweden. (December 2023)

Seminar, Cologne, Germany. (November 2023)

Complex Systems Seminar, Uppsala, Sweden. (November 2023)

Online Analysis Research Seminar, Online. (November 2023)

The 6th Annual Meeting of the SIAM Texas-Louisiana Section, Lafayette, LA. (November 2023)

The 14th BUAP-UAM-I-UTRGV joint international Conference, online. (November 2023)

HAYAMA Symposium on Complex Analysis in Several Variables XXIV, Hayama, Japan. (July 2023)

Seminar, Capital Normal University, China. (June 2023)

The Salon of Several Complex Variables and Complex Geometry, Beijing Normal University, China. (June 2023)

Seminar, Sun Yat-Sen University, China. (May 2023)

Partial Differential Equations and Complex Analysis (70th Birthday of Steven G. Krantz), Washington University, USA. (May 2023)

Zu Chongzhi Center Mathematics Research Seminar, Duke Kunshan, China (November 2022)

(Hyper) Complex Analysis and Geometry, Milan, Italy. (September 2022)

2022 Virtual Workshop in Analysis and Geometry, Jilin, China. (July 2022)

AMS Joint Mathematics Meetings, Seattle. (January 2022)

Seminar, University of Toledo, Online. (October 2021)

Seminar, East-West SCV, USA–Austria–Qatar, Online. (May 2021)

AMS Joint Mathematics Meetings, Online. (January 2021)

AMS Fall Western Sectional Meeting, University of California, Riverside, USA. (November 2019)

The 4th Annual Northeastern Analysis Meeting, University of Syracuse, USA. (October 2019)

Tianyuan International conference in Several Complex Variables, Changchun, China. (July 2019)

AMS Spring Central and Western Joint Sectional Meeting, University of Hawaii, Manoa, USA. (March 2019)

Several Complex Variables and Partial Differential Equations, Texas A&M University, Doha, Qatar. (January 2019)

AMS Fall Southeastern Sectional Meeting, University of Arkansas, Fayetteville, USA. (November 2018)

Colloquium, Georgia Southern University, Statesboro, USA. (October 2018)

Seminar, University of California, San Diego, USA. (February 2018)

AMS Fall Western Sectional Meeting, University of California, Riverside, USA. (November 2017)

AMS Fall Eastern Sectional Meeting, State University of New York, Buffalo, USA. (September 2017)

Seminar, Texas A&M University, College Station, USA. (April 2017)

AMS Spring Western Sectional Meeting, Washington State University, Pullman, USA. (April 2017)

Seminar, Rutgers University, Camden, USA. (February 2017)

Fullerton Geometry and Topology Seminar, California State University, Fullerton, USA. (November 2016)

Midwestern Workshop on Asymptotic Analysis, Indiana University Purdue University Fort Wayne, USA (October 2016)

Mini-course on Several Complex Variables, Autonomous University of Yucatan, Mexico. (June 2015)

AMS Central Spring Sectional Meeting, Michigan State University, USA. (March 2015)

JHU-UMD Complex Geometry Seminar, University of Maryland, USA. (February 2015)

AMS Fall Western Sectional Meeting, San Francisco State University, USA. (October 2014)

39th Spring Lecture Series, University of Arkansas, USA. (April 2014)

AMS Spring Eastern Sectional Meeting, University of Maryland, USA. (March 2014)

29th Southeastern Analysis Meeting, Virginia Tech, USA. (March 2013)

OTHER TALKS

Minor Oral, Washington University, USA. (April 2011)

Math. Circle, Washington University, USA. (February 2012)

Major Oral, Washington University, USA. (May 2012)

Graduate Organized Seminar, Washington University, USA. (August 2012)

Szegő Seminar, Washington University, USA. (January 2014)

Analysis Seminar, Washington University, USA. (April 2012, October 2012, November 2013, March 2014 and October 2014)

Seminars, National Autonomous University of Mexico (UNAM), Mexico. (May-June, 2015)

Seminars, University of California, Riverside. (December 2015, January 2016 and January 2017)

PROFESSIONAL ACTIVITIES

Conference Services:

Co-organizer for 7th Coastal Bend Math.-Stats. conf., Brownsville, TX. (April 2023)

Co-organizer for the Joint Mathematics meetings, Boston, MA. (January 2023)

Co-organizer for the Joint Mathematics meetings, Seattle, WA. (January 2022)

Co-organizer for the AMS Western Sectional meeting, Riverside, CA. (November 2017)

Mentoring: Advisor for the UTRGV Graduate Mathematical Society. (2023); Organizer for the Putnam competition training. (2017); Peer-mentor for PhD students, Washington University, St. Louis. (2013-2014); Lecturer at Math Circle, Washington University, USA. (February 2012)

Other Services Referee for J. Differ. Geom., J. Geom. Anal., Commun. Nonlinear Sci. Numer. Simul.; Reviewer for MathSciNet; Referee for S.-T. Yau High School

Science Award.

LANGUAGES Chinese (native), English, German (basic)