

Hao Sun

hsun71275@scut.edu.cn

381 Wushan St, Guangzhou, Guangdong, China

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Research Interests	Primary research interest is <i>algebraic geometry</i> . When I was Ph.D, I focused on <i>Hurwitz number</i> . Now I am working on <i>Higgs bundles</i> and its related field from the viewpoint of algebraic geometry.	
Education	<ul style="list-style-type: none">Ph.D., University of Illinois at Urbana-Champaign <i>Advisor: Maarten Bergvelt</i>B.S., South China University of Technology,	<div>2012-2018</div> <div>2008-2012</div>
Professional Experience	<ul style="list-style-type: none">Assistant Professor, South China University of Technology,Postdoc, Sun Yat-Sen University <i>Mentor: Changzheng Li</i>	<div>2020-Present</div> <div>2018 - 2020</div>
Visiting Position	<ul style="list-style-type: none">Visiting Assistant Professor, Institute of Geometry and Physics	<div>2023</div>
Fundings	<ul style="list-style-type: none">Guangdong Basic and Applied Basic Research Foundation No. 2019A1515110961National Natural Science Foundation of China (NSFC) No. 12101043National Key R&D Program of China No. 2022YFA1006600 (hosted by Qionglng Li)	<div>2020-2022</div> <div>2022-2024</div> <div>2023-2027</div>
Publications Preprints	<p>All of the papers have an arXiv version (with identifier “sun underscore h underscore 4”), which might be different from the published version.</p> <ol style="list-style-type: none">A formula about W-operator and its application to Hurwitz number, <i>Discrete Math.</i> 342(3), 715-722 (2019).Degree of the W-operator and Noncrossing Partitions, <i>Bull. Aust. Math. Soc.</i> 101(2), 186-200 (2020).Deformation of Locally Free Sheaves and Hitchin Pairs over Nodal Curve, <i>J. Korean Math. Soc.</i> 57(4), 809-823 (2020).Topological invariants of parabolic G-Higgs bundles (with G. Kydonakis and L. Zhao) <i>Math. Z.</i> 297(1), 585-632 (2021).The Beauville-Narasimhan-Ramanan correspondence for twisted Higgs V-bundles and components of parabolic $Sp(2n, R)$-Higgs moduli, (with G. Kydonakis and L. Zhao) <i>Trans. Amer. Math. Soc.</i> 374(6), 4023-4057 (2021).Moduli Problem of Hitchin Pairs over Deligne-Mumford Stack, <i>Proc. Amer. Math. Soc.</i> 150(1), 131-143 (2022).Monodromy of Rank 2 Parabolic Hitchin Systems, (with G. Kydonakis and L. Zhao) <i>J. Geom. Phys.</i> 171, Paper No. 104411, 18pp (2022).	

8. On the image of Hitchin morphism for algebraic surfaces: The case GL_n ,
(with L. Song) arXiv:2107.01679 (2021) to appear at IMRN.
9. Logahoric Higgs Torsors for a Complex Reductive Group,
(with G. Kydonakis and L. Zhao) arXiv:2107.01977 (2021) to appear at Math.
Ann.
10. Moduli Space of Λ -modules on Projective Deligne-Mumford Stacks,
arXiv: 2003.11674 (2020).
11. Poisson Structures on Moduli Spaces of Higgs Bundles over Stacky Curves,
(with G. Kydonakis and L. Zhao) arXiv:2008.12518 (2020).
12. Moduli Spaces of Coherent Sheaves on Projective Deligne-Mumford Stacks over
Algebraic Spaces,
arXiv:2101.00377 (2021).
13. Tame Parahoric Nonabelian Hodge Correspondence in Positive Characteristic
over Algebraic Curves,
(with M. Li) arXiv:2109.00850 (2021).
14. Tame Parahoric Nonabelian Hodge Correspondence on Curves,
(with P. Huang, G. Kydonakis and L. Zhao) arXiv: 2205.15475 (2022).
15. Meromorphic Parahoric Higgs Torsors and Filtered Stokes G -Local Systems on
Curves,
(with P. Huang) arXiv: 2212.04939 (2022).
16. Moduli Spaces of Filtered Local Systems,
(with P. Huang), to appear.

Teaching Experience

- Advanced Modern Algebra (Graduate)
Introduction to Modern Algebra and Geometry Fall 2022
- Calculus I (Math 151 in Rutgers adjoint with SCUT) Spring 2022
- Linear Algebra and Analytic Geometry
Calculus I (Math 151 in Rutgers adjoint with SCUT)
Basic Calculus (Math 135 in Rutgers adjoint with SCUT) Fall 2021
- Calculus II (Math 152 in Rutgers adjoint with SCUT) Spring 2021
- Finite Math (Math 124, UIUC) Fall 2017
- Calculus II (Math 231, UIUC) Spring 2017
- Calculus II (Math 231, UIUC) Fall 2016
- Calculus I (Math 221, UIUC) Fall 2015

Talks

- Nonabelian Hodge Correspondence on Noncompact Curves
Jinan University March 2023
- Higgs-de Rham Flows for Principal Bundles
Seminars on Hodge Conjecture
Tsinghua Sanya International Mathematics Forum January 2023
- Nonabelian Hodge Correspondence on Noncompact Curves
Guangdong Math Society Annual Conference 2023 January 2023
- Parabolic Bundles and Related Topics
Mini-Course *Institute of Geometry and Physics, USTC* January 2023
- Tame Parahoric Nonabelian Hodge Correspondence on Curves
ICCM 2022, *Southeast University* August 2022

- Tame Parahoric Higgs Torsors
Geometry Seminar, *Sun Yat-Sen University* June 2022
- Tame Parahoric Nonabelian Hodge Correspondence
China Southeastern Algebraic Geometry Symposium,
Sun Yat-Sen University June 2022
- On the Image of Hitchin Morphism for Algebraic Surfaces
Chern Institute NanKai University August 2021
- Moduli Space of Coherent Sheaves on Root Stacks
Geometry Seminar, *Shanghai Normal University* November 2020
- Moduli Space of Hitchin pairs over Deligne-Mumford Stack
Geometry Seminar, *Fudan University* November 2019
- Moduli Space of Hitchin pairs over Deligne-Mumford Stack
Topology and Geometry Seminar, *HUST* September 2019
- Connected Components of the Moduli Space of Parabolic $\mathrm{Sp}(2n, \mathbb{R})$ -Higgs Bundles
Geometry Seminar, *Chern Institute Nankai University* March 2019
- W-Operators and Hurwitz Numbers
UIUC Representation Theory Seminar, *UIUC* September 2017
- W-Operator and a Generating Function of Hurwitz Numbers
AMS Sectional Meeting, *University at Buffalo* September 2017