

# Hao-Ning Wu

## Affiliation

Department of Mathematics  
University of Georgia  
Athens, GA 30602

## Contact Information

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## Research Interests

- Approximation theory, applied harmonic analysis, and their applications to mathematical data science
- Partial differential equations (PDEs), integral equations, and their numerical analysis
- Control and optimization, control of transport and mixing via fluid flows

## Education

- Ph.D. in Mathematics, The University of Hong Kong: Nov 2023  
Thesis title: Restricted isometry and information-based numerical analysis  
Advisor: Xiaoming Yuan
- B.Sc. in Mathematics, Jinan University, Guangzhou, China: Jun 2019

## Employment

- Postdoctoral Research and Teaching Associate: Aug 2024 –  
Department of Mathematics, University of Georgia, Athens, GA (Mentor: Weiwei Hu)
- Postdoctoral Fellow: Sept 2023 – Jul 2024  
Department of Mathematics, The University of Hong Kong (Mentor: Dong Li)

## Visiting

- The University of Sydney, Australia, hosted by Prof. D.-X. Zhou: Jan 9 – 27, 2023

## Honors and Awards

2019 Doris Chen Postgraduate Scholarship: Dept of Mathematics, The University of Hong Kong  
2019 Bachelor's Thesis Award: Jinan Undergraduate School  
2018 National Scholarship: Ministry of Education of the People's Republic of China  
2017 Elite Undergraduate Training Program (2017–19): Jinan Undergraduate School

## ➤ RESEARCH AND RELATED ACTIVITIES

## Publications

- 🍃 The authorship order of all my coauthored works is alphabetical.  
Clickable entries to my database profiles: [MathSciNet](#), [zbMATH](#), [Google Scholar](#), and [ResearchGate](#).

## Journal Articles

7. Is hyperinterpolation efficient in the approximation of singular and oscillatory functions?, with C. An  
*J. Approx. Theory*, 299 (2024), 106013, 23PP
6. Bypassing the quadrature exactness assumption of hyperinterpolation on the sphere, with C. An  
*J. Complexity*, 80 (2024), 101789, 23PP
5. Enhanced total variation minimization for stable image reconstruction, with C. An and X. Yuan  
*Inverse Problems*, 39 (2023), 075005, 37PP
4. On the quadrature exactness in hyperinterpolation, with C. An  
*BIT Numer. Math.*, 62 (2022), 1899–1919

3. The springback penalty for robust signal recovery, with C. An and X. Yuan  
*Appl. Comput. Harmon. Anal.*, 61 (2022), 319–346
2. Lasso hyperinterpolation over general regions, with C. An  
*SIAM J. Sci. Comput.*, 43 (2021), A3967–A3991
1. Tikhonov regularization for polynomial approximation problems in Gauss quadrature points, with C. An  
*Inverse Problems*, 37 (2021), 015008, 19PP

### Preprints

1. Breaking quadrature exactness: A spectral method for the Allen-Cahn equation on spheres, with X. Yuan. arXiv: 2305.04820

### Presentations

#### Conferences and Workshops

- International Conference on Analysis and Applications in honor of Roderick S. C. Wong's 80th birthday, City University of Hong Kong, Jun 3 – 6, 2024  
*Hyperinterpolation, Marcinkiewicz–Zygmund property, and their use for spectral methods*
- The 7th Workshop on Recent Advances on Spectral Methods and Related Applications, Beijing Computational Science Research Center, China, Jun 8 – 9, 2019  
*The numerical study of regularized barycentric interpolation*

#### Seminars and Colloquiums

- Postgraduate student seminar, Dept of Math, The University of Hong Kong, Jun 26, 2023  
*Restricted isometry and information-based numerical analysis*
- Qualifying research seminar, Dept of Math, The University of Hong Kong, Jan 21, 2021  
*Lasso hyperinterpolation over general regions*

### Grants and Travel Support

#### Internal Funding Schemes

- Travel Support for RPg Students for Intl. Academic Training/Research Activities 2022/23 (Sept Round)  
HKU University Research Committee: 13,500 HKD, Jan 1 – 28, 2023
- National Undergraduate Innovation Research Grant 201710559017 - *Research on barycentric interpolation: algorithm and application*  
JNU Undergraduate School: 20,000 CNY, Aug 1, 2017 – Jul 31, 2018

### TEACHING AND RELATED ACTIVITIES

#### Classroom Teaching Duties

##### University of Georgia

Fall 2024    MATH1113    PreCalculus

##### Teaching Assistantship

**Certificate:** *Certificate of Teaching and Learning in Higher Education* (Nov 2019), issued by HKU Centre for the Enhancement of Teaching and Learning (CETL) after completing eight 3-hour modules on principles of learning, teaching, assessment, and feedback in a university context.

**Responsibilities:** Offering weekly tutorials, preparing/grading assignments, and holding office hours.

Spring 2023    MATH1013    University Mathematics II (HKU)

Fall 2022    MATH3901    Operations Research I (HKU)

Spring 2022    MATH1013    University Mathematics II (HKU)

Fall 2021	MATH3901	Operations Research I (HKU)
Spring 2021	MATH1009	Basic Mathematics for Business and Economics (HKU)
Fall 2020	MATH2101	Linear Algebra I (HKU)
Spring 2020	MATH1009	Basic Mathematics for Business and Economics (HKU)
Fall 2018	07010167	Numerical Linear Algebra (JNU)

### SERVICE AND RELATED ACTIVITIES

TIME FORMAT: MM/YY  
 ×*n*: *n* REPORTS DELIVERED

#### Academic Service

##### Referee for Journals

- Advances in Computational Mathematics (×4)
- IEEE Transactions on Neural Networks and Learning Systems
- International Journal of Computer Mathematics (×2)
- Numerical Algorithms

##### Misc

- Referee: S.T. Yau High School Science Award (Asia) (09/22, 09/21)
- Conference Assistant: Conference on Advances in Nonsmooth Analysis and Applications, Southern University of Science and Technology, Shenzhen, China (12/19)

#### Membership of Learned Societies

- CMS – Chinese Mathematical Society (since 08/23)
- CSCM – Chinese Society for Computational Mathematics (since 08/23)
- HKSIAM – Hong Kong Society for Industrial and Applied Mathematics (since 03/23)
- SIAM – Society for Industrial and Applied Mathematics (since 07/22)

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