# Hao-Ning Wu

**Affiliation**
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## Research Interests

❏ Analysis, partial differential equations (PDEs) and integral equations, and their numerical analysis
❏ Approximation theory, applied harmonic analysis, and their applications to mathematical data science

**Specific Topics** include multivariate approximation, orthogonal polynomials, high-dimensional numerical integration, spectral methods for PDEs, boundary integral methods, and compressed sensing/imaging.

## Education

❏ Ph.D. in Mathematics, The University of Hong Kong, China: Dec 2023 (to be conferred)
   Thesis title: Restricted isometry and information-based numerical analysis
   Advisor: Prof. X. Yuan
❏ B.Sc. in Mathematics, Jinan University, Guangzhou, China: Jun 2019

## Appointment

❏ Postdoctoral Fellow: Sept 2023 –
   Department of Mathematics, The University of Hong Kong, China (Mentor: Prof. D. 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
      *To attract top quality research postgraduate students to the department*
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
      *To offer major-related complementary research training to top students (<1% each cohort)*

## ✍ Research and Related Activities

## Research Publications

The authorship order of all my coauthored works is alphabetical.
Clickable entries to database profiles: MathSciNet, zbMATH, Google Scholar, and ResearchGate.

### Journal Articles

6. Bypassing the quadrature exactness assumption of hyperinterpolation on the sphere, with C. An
   *J. Complexity*, 80 (2024), 101789
5. Enhanced total variation minimization for stable image reconstruction, with C. An and X. Yuan
   *Inverse Problems*, 39 (2023), 075005
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

### Preprints

2. Breaking quadrature exactness: A spectral method for the Allen–Cahn equation on spheres, with X. Yuan
   arXiv: 2305.04820
1. Is hyperinterpolation efficient in the approximation of singular and oscillatory functions?, with C. An
   arXiv: 2205.08218

## Presentations

### Conferences and Workshops

- 15-min contributed talk, The 7th Workshop on Recent Advances on Spectral Methods and Related Applications, Beijing Computational Science Research Center, China, Jun 8 – 9, 2019

### Seminars and Colloquiums

- Postgraduate Student Seminar (thesis defense), Dept of Mathematics, The University of Hong Kong, China, Jun 26, 2023
- Qualifying Research Seminar, Dept of Mathematics, The University of Hong Kong, China, Jan 21, 2021

## Grants and Travel Support

### Internal Funding Schemes

- Travel Support for Research Postgraduate Students 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

### Teaching Assistant Duties

**Certificate:** *Certificate of Teaching and Learning in Higher Education* (Nov 2019), issued by HKU Centre for the Enhancement of Teaching and Learning (CETL) upon completion of eight 3-hour modules about the principles of learning, teaching, assessment and feedback in a university context.
**Responsibilities:** Offering weekly tutorials; preparing and grading assignments; holding office hours; and invigilating tests and exams.

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|---|---|---|
| Spring 2023 | MATH1013 | University Mathematics II (HKU[1]) |
| 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[2]) |

[1]Semesters at the University of Hong Kong: Fall (Sept – Dec) and Spring (Jan – May)
[2]Semesters at Jinan University: Fall (Sept – Jan) and Spring (Feb – Jul)

## 🌐 Service and Related Activities

## Academic Service

### Referee for Journals

- Advances in Computational Mathematics (05/23)
- Numerical Algorithms (08/22)

### 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 Aug 2023)
- CSCM – Chinese Society for Computational Mathematics (since Aug 2023)
- HKSIAM – Hong Kong Society for Industrial and Applied Mathematics (since Mar 2023)
- SIAM – Society for Industrial and Applied Mathematics (since Jul 2022)

Hong Kong · August 29, 2023.