

# Hongsheng Hu / 胡泓昇

A postdoctor in

Beijing International Center for Mathematical Research,  
Peking University.



## Basic Information

- **Research interests:** Algebra, representation theory, Lie theory, Coxeter groups and their representations, Kazhdan–Lusztig theory.
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- **Tel. / WeChat:** = (86) 18800000000 + 50287585.
- **Homepage:** <https://huhongsheng.github.io>
- **ORCID:** 0000-0002-1850-056X
- **Language:** Chinese (native). English.
- **Birth:** May 16, 1994. Zhangzhou, Fujian Province, China.
- **Other information:** Male. Married. No child. Political status: masses.

## Education and Working Experiences

- Since Jul. 2022. Postdoc.  
Beijing International Center for Mathematical Research, Peking University. Beijing, China.  
Mentor: Xiang Fu.
- Feb. 26, 2019 – Aug. 26, 2019. Visiting graduate student.  
University of California, Riverside. California, USA.  
Host professor: Carl Mautner.  
Funding: China Scholarship Council. No. 201804910559.
- Sep. 2016 – Jun. 2022. Ph.D.  
Academy of Mathematics and Systems Science, Chinese Academy of Sciences. Beijing, China.  
Major in Fundamental Mathematics.  
Supervisor: Nanhua Xi.
- Sep. 2012 – Jun. 2016. B.S.  
Fudan University. Shanghai, China.  
Major in Mathematics and Applied Mathematics.
- Sep. 2009 – Jun. 2012. Zhangzhou No. 1 High School of Fujian. Zhangzhou, Fujian, China.
- Sep. 2006 – Jun. 2009. Zhao'an Huai'en Middle School. Zhangzhou, Fujian, China.
- Sep. 2000 – Jun. 2006. Zhao'an Experimental Primary School. Zhangzhou, Fujian, China.

## Ph.D. Dissertation (written in Chinese)

- Title: Coxeter 群的“反射”表示. (“Reflection” representations of Coxeter groups.)

Full text available at <https://huhongsheng.github.io/thesis.pdf>

## Papers and Preprints

- On exterior powers of reflection representations, II.  
Preprint. 2024.  
[arXiv:2401.08215](https://arxiv.org/abs/2401.08215)
- Asymptotic log-concavity of dominant lower Bruhat intervals via the Brunn–Minkowski inequality.  
j.w. Gaston Burrull and Tao Gui. Preprint. 2023.  
[arXiv:2311.17980](https://arxiv.org/abs/2311.17980)
- On the dominant weight polytopes.  
j.w. Gaston Burrull and Tao Gui. Preprint. 2023.  
[arXiv:2311.16022](https://arxiv.org/abs/2311.16022)
- Representations of Coxeter groups of Lusztig’s  $a$ -function value 1.  
Preprint. 2023.  
[arXiv:2309.00593](https://arxiv.org/abs/2309.00593)
- On exterior powers of reflection representations.  
Published online. Bull. Aust. Math. Soc. 2023.  
<https://doi.org/10.1017/S0004972723000965>  
[arXiv:2306.16946](https://arxiv.org/abs/2306.16946)
- Reflection representations of Coxeter groups and homology of Coxeter graphs.  
Published online. Algebr. Represent. Theory. 2023.  
<https://doi.org/10.1007/s10468-023-10242-w>  
[arXiv:2306.12846](https://arxiv.org/abs/2306.12846) / Also visible at <https://rdcu.be/ds3Un>
- 最小二乘解与高斯消元法的注记.  
(A note on least squares solutions and Gaussian eliminations.)  
Preprint. Teaching paper. Written in Chinese. 2022.  
To appear in College Mathematics (大学数学).  
Manuscript available at <https://huhongsheng.github.io/22070035-20221008.pdf>
- Some infinite dimensional representations of certain Coxeter groups.  
Preprint. 2022.  
[arXiv:2205.09294](https://arxiv.org/abs/2205.09294)

## Lectures and Talks

(Abstracts and slides or notes are available on my homepage.)

- Exterior powers of reflection representations. (20 min)  
Nov. 18, 2023. The 16th National Conference on Algebra.  
Huaqiao University. Quanzhou, Fujian Province, China.

- Reflection representations of Coxeter groups. (30 min, in English)  
Nov. 12, 2023. The Fourth International Conference on Groups, Graphs and Combinatorics/  
The Fourth International Conference on Group Actions and Symmetrical Graphs.  
Southern University of Science and Technology. Shenzhen, Guangdong Province, China.
- Graphs and reflection representations, I — classifications and beyond. (60 min)  
Graphs and reflection representations, II — exterior powers. (60 min)  
Sep. 14, 2023. Seminar on representation theory.  
Academy of Mathematics and Systems Science, Chinese Academy of Sciences. Beijing, China.
- Hecke algebras — an incomplete introduction. (120 min)  
Apr. 27, 2023. 3+X undergraduate seminar.  
School of Mathematical Sciences, Peking University. Beijing, China.
- Coxeter groups and their reflection representations. (90 min, online)  
Nov. 28, 2022. Postdoc seminar.  
Beijing International Center for Mathematical Research, Peking University. Beijing, China.

## Teaching

- Linear Algebra II B. Spring 2022. Teaching assistant. Lecturer: Ming Fang.  
University of Chinese Academy of Sciences. Beijing, China.
- Algebra. Fall 2019. Teaching assistant. Lecturer: Nanhua Xi.  
University of Chinese Academy of Sciences. Beijing, China.
- Linear Algebra II A. Spring 2017. Teaching assistant. Lecturer: Nanhua Xi.  
University of Chinese Academy of Sciences. Beijing, China.
- Linear Algebra I A. Fall 2016. Teaching assistant. Lecturer: Nanhua Xi.  
University of Chinese Academy of Sciences. Beijing, China.

## Professional Activities

- Since Dec. 2021. Reviewer for zbMATH Open.

## Funding

- Feb. 2019 – Aug. 2019. China Scholarship Council. No. 201804910559.

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