Ruichen XU (徐睿晨)   Ph.D Student, Chinese Academy of Sciences

✉ xuruichen21@mails.ucas.ac.cn

🔗 https://xuruichen98.github.io/

Citizenship: People's Republic of China

Current Place of Residence: Beijing, China

Education

- **Chinese Academy of Sciences**   *Ph.D student in mathematics*   Sept 2021 - *July 2026 (Expected)*

    - Doctoral Advisor: Xin WAN.
    - Research Interest: Number theory, especially Iwasawa theory. In particular:
        * Automorphic methods in Iwasawa theory
        * Construction of Euler systems
        * Iwasawa theory in (Hida, Coleman or universal) families
        * Arithmetic applications of Iwasawa theory: Birch and Swinnerton-Dyer conjecture, and its generalization to the Bloch-Kato conjecture, etc.

- **Beihang University**   *Bachelor of Science in mathematics*   Sept 2017 - July 2021

    - Undergraduate Advisor: Peng GAO and Shijin ZHANG (thesis advisor).
    - Undergraduate Thesis: *The Proof of Fermat's Last Theorem: Wiles' Proof and Beyond*

Publications and Preprints

- (In preparation) Olivier FOUQUET, Arthur GERARD, <u>Ruichen XU</u>, *Universal Iwasawa theory and modular forms of weight one.*

- Haidong LI, <u>Ruichen XU</u>, *On the Mordell-Weil rank of certain CM abelian varieties over anticyclotomic towers*, preprint (2025). arXiv:2502.12648.

- <u>Ruichen XU</u>, *The Gan-Gross-Prasad period of Klingen Eisenstein families over unitary groups*, preprint (2024). arXiv: 2410.13132.

Visiting Experiences

- **Université Marie et Louis Pasteur**   *Visiting Doctoral Student*   France, Dec 2024 - July 2025

    - Host Advisor: Olivier FOUQUET.
    - Funded by the program "*2024 International Research Collaboration Program for Postgraduate Students*" of Chinese Academy of Sciences (1 350 EUR monthly).

- **Peking University**   *13th Enhanced Program for Graduate Study*   China, Spring 2021

- **Peking University**   *12th Enhanced Program for Graduate Study (Online)*   China, Spring 2020

Conference Talks

- **33èmes Journées Arithmétiques**   July 1, 2025
  Title: The Gan-Gross-Prasad period of Klingen Eisenstein families over unitary groups.
  Location: Université du Luxembourg. Esch-sur-Alzette, Luxembourg.

- **Géométrie algébrique et théorie des nombres en Bourgogne Franche-Comté**   Mar 28, 2025
  Title: The method of Eisenstein congruences in Iwasawa theory.
  Location: Institut de Mathématiques de Bourgogne. Dijon, France.

Teaching Experiences

- **Advanced Abstract Algebra**   *Teaching Assistant, at Beihang University*   Fall 2020
  Undergraduate course on Galois theory, the theory of modules and the representation theory.

- **Complex Analysis**   *Teaching Assistant (Online), at Beihang University*   Spring 2020
  Undergraduate course on basic complex analysis for students majoring in mathematics.

- **Undergraduate Mentors Program**   *Mentor, at Beihang University*   Fall 2018 - Spring 2019
  Guiding freshmen in making a smooth transition from middle school to undergraduate studies by
  providing psychological and administrative support, along with academic guidance in foundational
  courses including calculus, mathematical analysis, linear algebra, programming (C/Python), and
  physics.

Scholarships

- **Professor Hua Loo-Keng Scholarship**   *Chinese Academy of Sciences*   2022, 2023
  for excellence in PhD qualifying exams and research (100 000 CNY each).

- **Professor Hua Loo-Keng Scholarship**   *Chinese Academy of Sciences*   2019, 2020, 2021
  for excellence in undergraduate mathematical coursework and contests (2 000 CNY each).

Conferences Attended

- **33èmes Journées Arithmétiques**   *Esch-sur-Alzette, Luxembourg*   July 2025
  At the *Université du Luxembourg*.

- **Iwasawa Theory and Representations of p-Adic Groups**   *Lille, France*   June 2025
  At the *Laboratoire Paul Painlevé, Université de Lille*.

- **Géométrie algébrique et théorie des nombres en Bourgogne Franche-Comté**   Mar 2025
  At the *Institut de Mathématiques de Bourgogne, Dijon, France*.

- **Young researchers in Galois Representations and related topics**   *Genova, Italy*   Jan 2025
  At the *Università di Genova*.

- **Workshop on p-adic Geometry**   *Singapore*   Nov 2024
  At the *National University of Singapore*.

- **BSD Conjecture and Goldfeld Conjecture**   *Kunming, Yunnan, China*   Oct 2024
  At *Tianyuan Mathematics Research Center*.

- **Development of Iwasawa Theory**   *Yokohama, Kanagawa, Japan*   Jul 2024
  A conference in honor of the 60th birthday of Masato Kurihara. At *Keio University*.

- **2024 Jinling Conference of Number Theory**   *Nanjing, Jiangsu, China*   Apr 2024
  At *Nanjing University*.

- **Special Values of L-functions**   *Sanya, Hainan, China*   Jan 2024
  At *Tsinghua Sanya International Mathematics Forum*.

- **The 3rd Cross Strait Workshop on Arithmetic Geometry**   *Hefei, Anhui, China*   Aug 2023
  At *the University of Science and Technology of China*.

- **Workshop on Arithmetic and Topology**   *Shenzhen, Guangdong, China*   Aug 2023
  At *the Southern University of Science and Technology*.

- **Iwasawa 2023: in memory of John Coates**   *Cambridge, the United Kingdom*   July 2023
  At *the University of Cambridge.*

- **Satellite Conference in Number Theory of ICBS**   *Beijing, China*   July 2023
  At *Morningside Center of Mathematics, Chinese Academy of Sciences.*

- **2023 Jinling Conference of Number Theory**   *Nanjing, Jiangsu, China*   June 2023
  At *Nanjing University.*

Summer Schools Attended

- **Summer school on Galois representations and Reciprocity**   *Hanoi, Vietnam*   July 2024
  At *Vietnam Institute for Advanced Study in Mathematics.*

- **2021 Summer School on Number Theory**   *Xi'an, Shaanxi, China*   July 2021
  At *Xi'an Jiaotong University.*

- **Theta Correspondence and Its Arithmetic Applications**   *Suzhou, Jiangsu, China*   July 2021
  At *Soochow University.*

- **Short Courses on Number Theory**   *Xiamen, Fujian, China (Online)*   July 2020
  At *Xiamen University.*

- **2020 SCMS Algebraic Geometry Summer School**   *Shanghai, China (Online)*   July 2020
  At *Shanghai Center of Mathematical Sciences, Fudan University.*

- **"The Road to Mathematics" Int'l Summer School**   *Harbin, Heilongjiang, China*   July 2019
  At *Harbin Institute of Technology.*

Seminars Organized and Attended

As the organizer and the main speaker of the following seminars among students:

- **Universal Iwasawa theory**   Fall 2024
  Study the the article "*The Iwasawa Main Conjecture for universal families of modular motives*" by O.Fouquet and X.Wan.

- **Automorphic methods in Iwasawa theory**   Spring 2023 - Fall 2023, Spring 2025
  Study the machinery of Eisenstein congruences via the article "*The Iwasawa Main Conjectures for* GL_2" by C.Skinner and E.Urban, and its later developments.

- **Iwasawa Theory of elliptic curves**   Fall 2021, Fall 2023
  Study the article "*Introduction to Iwasawa Theory for Elliptic Curves*" by R.Greenberg, with a special focus on solving all the exercises.

- **Automorphic Forms and Automorphic Representations**   Spring 2022 - Fall 2022
  Following the textbook "*An Introduction to Automorphic Representations*" by J.Getz and H.Hahn.

As the organizer and a speaker of the following seminars among students:

- **Rational points on elliptic curves**   Fall 2024
  Following the textbook "*Rational Points on Modular Elliptic Curves*" by H.Darmon.

- **Arithmetic of elliptic curves**   Fall 2023 - Spring 2024
  Following the textbooks "*Arithmetic of Elliptic Curves*" and "*Advanced Topics in the Arithmetic of Elliptic Curves*" by J.Silverman.