

# Linyuan Liu

## Education

- 2009–2012 **Bachelor of Pure and Applied Mathematics**, *Tsinghua University*, Beijing, China.  
GPA: 93/100.
- 2012–2016 **École Normale Supérieure**, Paris, France.  
Master's degree obtained at Université Paris-sud on dynamical systems (mention: très bien)
- 2016–2019 **PhD in Mathematics**, *Sorbonne University (previously known as Université Pierre et Marie Curie)*, Paris, France.  
Thesis advisor: Patrick Polo  
Thesis title: Cohomologie des fibrés en droite sur  $SL_3/B$  en caractéristique positive : deux filtrations et conséquences  
Date of thesis defense: 26/06/2019  
Reviewers: Simon Riche and Geordie Williamson  
Jury: Anna Cadoret, Caroline Gruson, François Loeser, Patrick Polo, Simon Riche, Wolfgang Soergel

## Employments

- 09/2019–present **Visiting Researcher/Research Associate**, *Sydney Mathematical Research Institute*, Sydney, Australia.
- 09/2020–07/2021 **Membership of Special Year on Geometric and Modular Representation Theory**, *Institute for Advanced Study*, Princeton, New Jersey.

## Publications and Preprints

1. **On the cohomology of line bundles over certain flag schemes II**, joint work with Patrick Polo, arXiv:1908.08432, To appear in Journal of Combinatorial Theory, Series A.
2. **Cohomologie des fibrés en droite sur  $SL_3/B$  en caractéristique positive : deux filtrations et conséquences**, arXiv: 1903.08758, submitted for publication.
3. **On the cohomology of line bundles over certain flag schemes**, arXiv:1908.08438, submitted for publication.
4. **Filtrations of tilting modules and costalks of parity sheaves**, arXiv:2007.12444, Preprint.

## Awards

- 2012 **The 3rd session of Shing-Tung Yau Mathematics Competition for College students**, *Team Medals*, Silver Medal.

---

## Passed Talks and Presentations

- 10/2019-11/2019 **Informal Friday Seminar (8 sessions)**, *University of Sydney*, Sydney, Australia.  
I gave eight two-hour talks in this seminar in various topics.
- 06/2020 **Paris Algebra Seminar**, *Institut Henri Poincaré*, Paris, France.
- 02/2020 **New Connections in Representation Theory**, *Mooloolaba*, Queensland, Australia.  
I gave a conference talk about my own research in this conference.
- 12/2019 **The 63rd Annual Meeting of the Australian Mathematical Society**, *Monash University*, Melbourne, Australia.
- 06/2019 **Séminaire Groupes, Représentations et Géométrie**, *Université Paris-Diderot*, Paris, France.
- 05/2019 **Séminaire de Géométrie Complexe**, *Université de Lorraine*, Nancy, France.
- 05/2019 **Séminaire et Groupe de Travail GAAO**, *Université Clermont Auvergne*, Clermont-Ferrand, France.
- 05/2019 **Séminaire Quantique**, *Université de Strasbourg*, Strasbourg, France.
- 05/2019 **Séminaire d'Algèbre-Géométrie**, *Université de Versailles*, Versailles, France.
- 05/2019 **Séminaire des Thésards**, *Sorbonne Université*, Paris, France.
- 2014–2019 **Séminaire Mathjeunes (3 sessions)**, Paris, France.  
I have given three talks on different topics ranging from ergodic theory to representation theory in this seminar.

---

## Teaching Experiences

- 2016–2019 **Teaching Assistant**, *Sorbonne University*, Paris, France.  
The main duty is to give supplementary courses to small groups of students (around 30) where I led them doing exercises related to the main course and explained some technical details omitted during the main course. The following is a list of courses for which I served as a teaching assistant.
- 2016–2017 **Topology and differential calculus.**
- 2016–2017 **Power series, integrals with parameters, applications to differential equations.**
- 2017–2018 **Series of functions, Fourier series, generalized integrals.**
- 2017–2018 **Algebra.**
- 2018–2019 **Permutation groups and isometry groups.**

---

## Work groups and Expository Talks

- 2017–2018 **Work group on model theory.**  
Together with three other PhD students of IMJ-PRG, I studied the general theory and several special topics in model theory, during which I gave two talks on quantifier elimination properties and two talks on o-minimality in general and of the theory of real closed fields. Each talk lasted for two hours.
- 2014–2015 **Lessons on Szemerédi's theorem.**  
Together with several other students of ENS, I studied the proof of Szemerédi's theorem using methods in ergodic theory and gave a presentation on this topic.

2013–2014 **Work group on geometric measure theory.**

Together with two other students of ENS, I read the book *Geometric Measure Theory* by Herbert Federer. We met once a week and gave talks in turn.

2012–2013 **Presentations of the first year in ENS.**

With another student, I studied and gave a presentation on Hilbert's third problem.

---

## Languages

Chinese Native speaker

English Fluent

French Fluent

German Basic

Spanish Basic

Italian Basic

---

## Computer Skills

Programming Languages C, Sage,  $\text{\LaTeX}$

---

## Other Skills

Marathon I have finished 10 marathons with the best record in 3 hours and 45 minutes.