

# Jinyue Luo

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## EDUCATIONAL BACKGROUND

<b>Peking University</b>	Beijing, China	09/2015-06/2019
Bachelor of Science, School of Mathematical Sciences		
Major in pure math, Overall GPA: 3.70		
<b>University of Chicago</b>	Chicago, U.S.	09/2019-06/2020
Master of Mathematics		
<b>University of Chicago</b>	Chicago, U.S.	09/2019-present
PhD of Mathematics Advisor : Frank Calegari		

## SELECTED AWARDS & HONORS

- 1<sup>st</sup> Prize in National High School Math Leagues, Gold Medal of Chinese Mathematical Olympiad, selected into the National IMO Training Team 2014
- Gold Medal of 13<sup>th</sup> Chinese Western Mathematics Invitation Competition, 1<sup>st</sup> Place, first female in history 2013
- Gold Medal of 13<sup>th</sup> Chinese Girls Mathematical Olympiad, 1<sup>st</sup> Place 2014
- National Scholarship 2016
- Role-model for Merit Student of Peking University 2016,2017,2018
- Outstanding Graduates of Beijing 2019

## RESEARCH INTEREST

Number Theory : modular forms and Galois representations.

## SUPERVISED INDEPENDENT RESEARCH EXPERIENCE

**Reading Program: Higher Composition Law and Its Application in Elliptic Curves**  
05/2017-10/2018

Research, Advisor: Prof. Ruochuan Liu

### Higher Composition Laws

- Figured out the 1-1 correspondence between Bhargava's Cube and binary quadratic forms, and how it induce the arithmetic of the cubes, namely, the composition law
- More higher composition laws to parametrize rings and fields of small ranks by the integer orbits of a group representation

### Application: Estimation of Elliptic curves' ranks

- Read BSD's original papers to comprehend the connection between the 2-Selmer group elements and binary quartic forms, which led to the BSD conjecture
- Counted binary quartic forms with bounded invariants using composition laws and tools in harmonic analysis
- Concluded that the limsup of the average rank of elliptic curves(ordered by heights) is at most 1.5

## EXTRACURRICULAR ACTIVITIES

Vice President of Student Union of the School of Mathematical Sciences	03/2017–03/2018
Peer Counselor of the School of Mathematical Sciences	09/2017-06/2019
Volunteer teacher at Xinjie Middle School, in Midu County, Yunnan Province	07/2016
The Peking University Student Chorus	03/2018-06/2019
• The 120 <sup>th</sup> Anniversary of Peking University	05/2018
• Choral Concert Growth Takes Time	11/2018