

# Shuyi Weng

## CONTACT INFORMATION

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## MATHEMATICAL INTERESTS

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Complex dynamical systems, Julia sets, and ergodic theory  
Conformal geometry, numerical approximation algorithms for Riemann maps  
Potential theory on the complex plane  
Undergraduate mathematics education at all levels

## EDUCATION

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**Ph.D., Mathematics, Northwestern University** 2020  
Thesis: “Harmonic caps and planar conformal geometry”  
Committee: Laura DeMarco (chair), Kathryn Lindsey, Benjamin Weinkove  
**B.A., Mathematics and Chemistry, Bard College** 2015

## ACADEMIC APPOINTMENTS

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**Instructor, Evanston Township High School** 2022–Present  
**Postdoctoral Lecturer, Northwestern University** 2020–Present

## TEACHING EXPERIENCE

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**Instructor, Evanston Township High School**  
Advanced topics in mathematics: combinatorics and graph theory Fa2022  
Advanced topics in mathematics: TBD Sp2023  
**Instructor, Northwestern University**  
Math 100: Quantitative reasoning Sp2021\*  
Math 105-6: First-year seminar Wi2023  
Math 202: Finite mathematics Wi2021\*  
Math 211: Short course in calculus Sp2023  
Math 220-1: Single-variable differential calculus Fa2022  
Math 224: Integral calculus of one variable Su2019, Su2018  
Math 230: Differential calculus of multivariable functions Sp2019  
Math 240: Linear algebra Sp2021\*, Wi2019  
Math 290-1,2,3: MENU Linear algebra and multivariable calculus<sup>†</sup> 2021–2022, 2020–2021\*

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\*These courses were taught remotely due to the Covid-19 pandemic.

<sup>†</sup>MENU is Northwestern University’s undergraduate honors mathematics program. It provides qualified undergraduates with a thorough foundation in mathematics suitable for advanced study in mathematics and its applications across a wide range of disciplines. Math 290 is a sequence of three courses across the Fall, Winter, and Spring quarters.

Math 300: Foundations of higher mathematics	Sp2023
Math 330-1: Abstract algebra (group theory)	Fa2020*
Math 330-2: Abstract algebra (ring theory)	Wi2022
Math 354: Chaotic dynamical systems	Fa2021

**Teaching Assistant, Northwestern University** 2016–2019

Lead discussion sessions, grade student homework assignments, and hold weekly office hours for a range of courses in the mathematics department including the calculus sequence, linear algebra, introduction to proofs, abstract algebra, real analysis, dynamical systems, *etc.*

## MENTORSHIP

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### Undergraduate Research:

Mary Clayton and Ryan Yi, *Northwestern University* Wi2022–Sp2022  
 “Folding patterns of polygonal cap construction” Undergraduate Research Assistant Program

Mercedes Sandu and Jade Zhang, *Northwestern University* Wi2021–Sp2021  
 “Polyhedral development and polygon folding” Undergraduate Research Assistant Program

Yuxi Han, *Northwestern University* Su2017  
 “Companion shapes and convex body development” REU supervisor: Laura DeMarco

### Directed Reading Program:

Nicholas Karris, *Northwestern University* Wi2020  
 “Linear algebra, image processing, and geometry”

### Postdoctoral Mentor:

Causeway Postbaccalaureate Program, *Northwestern University* 2021–2023

### Teaching Assistance:

New TA Conference Workshop Leader, *Northwestern University* 2017

## SERVICE

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### Multisection Course Coordination, Northwestern University

Math 290-1,2,3: MENU Linear algebra and multivariable calculus	2021–2022
Math 220-1: Single-variable differential calculus	Fa2022

**Co-chair, Northwestern Emerging Scholar Program, Northwestern University** 2021–2023

## GRANTS

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**Tensor SUMMA Grant, Mathematical Association of America** 2022–2023  
 Project Director, Northwestern Emerging Scholar Program

**Undergraduate Research Assistance Program, Northwestern University** 2020–2022

## HONORS AND AWARDS

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<b>Excellence in Teaching by a Postdoctoral or Visiting Faculty Member, Northwestern</b>	2022
<b>Fletcher Award for Excellence in Research Mentorship, Northwestern University</b>	2021
<b>Best Teaching Assistant Award, Northwestern University</b>	2019
<b>Sara Gelbart Prize in Mathematics, Bard College</b>	2015
<b>John Bard Scholarship, Bard College</b>	2014
<b>Distinguished Scientist Scholarship, Bard College</b>	2011

## PAPERS AND PREPRINTS

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- [4] M. Sandu, S. Weng, J. Zhang, *Closing problem of boundary curve in the cap-construction algorithm*, in preparation
- [3] Y. Han, S. Weng, *Companion shapes and their Alexandrov realization*, preprint
- [2] S. Weng, *Harmonic caps and planar conformal geometry*, PhD thesis, Northwestern University, 2020
- [1] C. N. LaFratta, O. Simoska, I. Pelse, S. Weng, M. Ingram, *A convenient direct laser writing system for the creation of microfluidic masters*, *Microfluid Nanofluid* (2015) **19**, 419-426.

## RESEARCH PRESENTATIONS

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### **Complex and Arithmetic Dynamics Seminar**, *Northwestern University*

- “Schwartz-Christoffel mappings” May 2019
- “Harmonic caps and conformal geometry” February 2019
- “Harmonic measure and Carathéodory convergence” May 2018
- “The zipper algorithm” October 2017
- “The homeomorphism group of the Eyes Julia set” January 2016

## UNDERGRADUATE TALKS

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### **Northwestern Undergraduate Mathematics Society**, *Northwestern University*

- “Polyhedral development and polygon folding” with Mercedes Sandu and Jade Zhang May 2021
- “Prime spirals, solar eclipses, and rational approximations” February 2020
- “A geometric solution to the Basel problem” November 2018

## PANELS

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- CIRTL at Northwestern Information Session**, *Northwestern University* November 2019
- How CIRTL Impacted My Career: Hearing from Teaching Faculty**, *CIRTL Alumni Network* March 2022

## PROFESSIONAL DEVELOPMENT EXPERIENCE

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- “Mentoring Up & Down” workshop series, *Northwestern University* Su2021
- Practicum in Foundations of Online Teaching, *Northwestern University* Su2020
- Searle Teaching-as-Research Program, *Northwestern University* Wi2019–Sp2019
- Teaching Certificate Program, *Northwestern University* Fa2018–Sp2019
- Mentored Discussion in Teaching, *Northwestern University* Sp2017

## PROFESSIONAL SKILLS

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- Programming:** Mathematica, MATLAB, Java, Python, Sage
- Language:** Mandarin Chinese, English

LAST UPDATED IN JUNE 2022