

# JAEHYUN WOO

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1, Gwanak-ro, Gwanak-gu, Seoul, Republic of Korea

<https://jaehwoo.github.io/mypage/>

## EDUCATION

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**Seoul National University**  
Ph.D. Student in Mathematics

*Mar 2025 - Current*

**Seoul National University**  
B.S. in Mathematics (minor in chemistry)

*Mar 2019 - Feb 2025*

GPA: 4.16/4.3

Thesis: Restriction Estimates for Hypersurfaces (Advisor: Changkeun Oh)

Leave for Mandatory Military Service: Sep 2022 - Aug 2024

## RESEARCH INTERESTS

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My research interest mainly lies in harmonic analysis. I'm also interested in partial differential equations arising from physics.

## RESEARCH EXPERIENCE

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**Undergraduate Research Internship**, Seoul National University

*Sep 2024 - Jan 2025*

“Multilinear Estimates: Broad-narrow Analysis and Induction on Scales” (Advisor: Changkeun Oh)

· Studied the evolution of restriction theory: bush and hairbrush argument for Kakeya type estimates, multilinear estimates, polynomial partitioning method, and induction on scales. Studied the evolution of decoupling theory and its application to analytic number theory.

· Done in tandem with undergraduate thesis.

· Keywords: Restriction inequalities, Decoupling inequalities, multilinear estimates, broad-narrow analysis, induction on scales

**Undergraduate Research Internship**, Seoul National University

*Jun 2022 - Aug 2022*

“Small Scale Formation of 2D Incompressible Euler Equations on a Domain with Smooth Boundary” (Advisor: In-Jee Jeong)

· Showed vorticity gradient growth for a long time in a smooth domain similar to a disc or a strip, by applying the notion of Hausdorff convergence and gamma-convergence to the hyperbolic flow scenario near the boundary

· Keywords: 2D incompressible Euler equations, long time behavior, Green's function for elliptic equations, boundary regularity, Linear and nonlinear advection, Hausdorff convergence,  $\gamma$ -convergence, tubular neighborhood

**Undergraduate Research Internship**, Seoul National University

*Dec 2021 - Feb 2022*

“Global-in-time Gevrey-1/s Regularity of Incompressible Euler Equations on 2D Torus” (Advisor: In-Jee Jeong)

· Studied recent results on inviscid damping, and obtained Gevrey-1/s norm estimates with decreasing radius of analyticity by using paraproduct decomposition, which demonstrates global-in-time Gevrey-1/s regularity

· Keywords: 2D incompressible Euler equations, inviscid damping, long-time behavior, Fourier multiplier, paraproduct decomposition, Gevrey space, radius of analyticity

## TEACHING EXPERIENCE

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**Teaching Assistant**, Seoul National University

*Mar 2025 - Current*

- Exercise sessions:
- Grading:

**Undergraduate Tutoring**, Seoul National University

*Mar 2022 - Jun 2022*

Organized exercise sessions in "Basic Mathematics 1"

- Topics: basic single and multivariable calculus, ordinary differential equations and dynamical systems

## SKILLS

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### **Programming Languages**

- Numerical Analysis with Python and Julia
- Computational Chemistry: GAMESS, ORCA (quantum computations), LAMMPS (classical molecular dynamics)