# Eunji Yoo

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## Education

- **Ph.D. in Applied Mathematics**, University of California, Merced (UC Merced) [2017 – 2023]
    - Advisors: Dr. François Blanchette and Dr. Shilpa Khatri
    - Thesis title: Flows of settling marine aggregates and complex fluid rheology.
- **M.S. in Applied Mathematics**, San Diego State University (SDSU) [2014 – 2017]
- **B.S. in Mathematics**, Hankuk University of Foreign Studies, South Korea [2009 – 2013]

## Research Experiences

- Postdoctoral Researcher [Sep. 2023 – Current]
    - National Renewable Energy Laboratory (NREL)
    - Supervisors: Dr. Marc Day & Dr. Michael Martin
    - Developing AMReX codes for the embedded boundary with triangular mesh surface generation with an STL file.
    - Simulations of decarbonization in the steelmaking process in AMReX-incflo to analyze the interactions between the surrounding fluid and the pellet while melting.
        - Collaboration with researchers at Danieli & C. S.p.A.
- National Science Foundation Mathematical Sciences Graduate Internship [2022]
    - Hosted by Lawrence Berkeley National Laboratory (LBNL)
    - Mentor: Dr. Ishan Srivastava
    - Studying a second-order rheological model for a complex fluid flow with pressure-dependent viscosity.
    - Implementing the granular rheology in the AMReX framework using C++.
- National Science Foundation Mathematical Sciences Graduate Internship [2021]
    - Hosted by the National Renewable Energy Laboratory (NREL)
    - Mentor: Dr. Michael Martin
    - Creating a comprehensive solver package for a complex equation of state to obtain various properties for a wide temperature range of helium in Python.

## Technical Skills

Computational skills: C++, Matlab, Python, Linux-based system, LaTex, Mathematica
Libraries: AMReX, Fast Multipole Method
Languages: English, Korean

## Publication

- E. Yoo, S. Khatri, and F. Blanchette, Hydrodynamic forces on randomly formed marine aggregates. Phys. Rev. Fluids, 5:044305, Apr 2020, DOI: https://doi.org/10.1103/PhysRevFluids.5.044305
- E. Yoo, Nonlinear Waves in Density Stratified Fluids over Underwater Topography, Master thesis, Dept. of Mathematics, San Diego State University

## Awards & Fellowships

Graduate Dean's Dissertation Fellowship (UC Merced) [2023]
National Sciences Foundation Mathematical Sciences Graduate Internship [2021, 2022]
Southern California Edison Fellowship [2021]
Applied Math Summer Research Fellowship (UC Merced) [2018, 2019]
Valedictorian Award at Hankuk University of Foreign Studies [2013]
Asan Foundation STEM undergraduate students Fellowship [2012]

## Presentations

- 2024 Society for Industrial and Applied Mathematics (SIAM) Annual Meeting [July. 2024]
  - Computational Methods for Multi-Physics Simulation of Melting in Steelmaking (poster)
- The American Physical Society's (APS) March Meeting 2023 [Mar. 2023]
  - Simulations of settling marine aggregates in a stratified fluid
- NSF Mathematical Sciences Summer Research Symposium [Aug. 2022]
  - Pressure-dependant rheological stress model of continuum granular flows
- The Computational Science division at LBNL summer poster session [Aug. 2022]
  - Continuum modeling of complex fluids with a second-order rheology (poster)
- Ocean Sciences Meeting (OSM) 2022 [Feb. 2022]
  - Simulations of settling marine aggregates in a stratified fluid
- APS 74th Annual Meeting of the Division of Fluid Dynamics [Nov. 2021]
  - Simulations of settling marine aggregates in a stratified fluid
- UC Merced, Energy and Environment seminar [Every semester in 2019 - 2023]
  - Simulations of flow around marine aggregates
  - Settling marine aggregate in a stratified fluid
  - Quick overview of) Fast multipole method for Stokes equations
- 7th Annual Rocky Mountain Fluid Mechanics Research Symposium [Aug. 2021]
  - One-dimensional flow of cryogenic Helium below 4K
- APS 72nd Annual Meeting of the Division of Fluid Dynamics [Nov. 2019]
  - Settling of randomly formed marine aggregates
- The Yosemite Fluid Meeting (FluMe) [Aug. 2018]
  - Flow around marine aggregates with boundary integral equations (poster)

## Teaching and Mentoring Experiences

- Teaching Assistant at UC Merced [2017-2023]
  - Calculus 2, Vector Calculus, Linear Algebra, Ordinary/Partial Differential Equations, and Numerical Methods.
- Mentor for Applied Math Challenge hosted by UC Merced SIAM Student chapter [2022]
  - Mentored a group of four undergraduate students to solve a challenging problem using numerical methods.
- Graduate Assistant for Research Experiences for Undergraduates at SDSU [2017]
  - Research topic: Study of Vortex Dynamics with Free Surface in a Shallow Water Regime
- Teaching Assistant at SDSU [Fall 2015 - Spring 2017]
  - Calculus 2 and Vector Calculus

**Extra Activities**

- 2023 STEM Diversity Summit Panelist hosted by ORISE [Oct 2023]
- UC Merced Applied Math Graduate program recruitment talk at SDSU [Oct. 2022]
- UC Merced SIAM student chapter, social media coordinator [2022 – 2023]

**References**

- François Blanchette

  Professor, Applied Mathematics Dept., University of California, Merced, fblanchette@ucmerced.edu
- Shilpa Khatri

  Associate Professor, Applied Mathematics Dept., University of California, Merced, skhatri3@ucmerced.edu
- Micheal Martin

  Researcher IV–HPC, HPACF group, National Renewable Energy Laboratory, Michael.Martin@nrel.gov
- Marc Day

  Group Manager III, HPACF group, National Renewable Energy Laboratory, Marcus.Day@nrel.gov