

# Alejandra Rosselli-Calderon

## PERSONAL INFORMATION

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**Email:** aleroaca@ucsc.edu

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## EDUCATION

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**Doctor of Philosophy in Astronomy and Astrophysics** *in progress*

University of California, *Santa Cruz, CA*

**Master of Science in Physics** May 2022

Brown University, *Providence, RI*

Sheridan Teaching Seminar - Reflective Teaching Certification

**Bachelor of Arts in Physics** May 2020

Clark University, *Worcester, MA*

Highest Honors in *Physics*

Minors in *Mathematics* and *Data Science*

Summa Cum Laude (GPA: 4.0)

**College Preparatory Curriculum** June 2016

Colegio Los Nogales, *Bogota, Colombia*

Fine Arts Concentration Program

AP Scholar with Distinction

Valedictorian

## HONORS & AWARDS

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***Award of Excellence as a Graduate Teaching Assistant*** Spring 2021

***Phi Beta Kappa National Honor Society*** Spring 2020

***Albert C. Erickson '30 Academic Award*** Fall 2019

Awarded annually to one senior at Clark University “who has done outstanding work in Physics and Mathematics, and who shows unusual promise in these fields.”

***Gryphon and Pleiades Honor Society*** Fall 2019 – Spring 2020

Senior leadership and service honor society which includes 12 outstanding Clark University seniors who exemplify the motto “Scholarship, Leadership, and Citizenship.”

***Bruce and Shari Weiller Summer Research Award*** Summer 2019

***University Physics Competition: Bronze Medal*** Fall 2018

International contest for teams of students to spend 48 hours analyzing an applied scenario using principles of physics and writing a formal paper describing their work.

***Albert C. Erickson '30 Summer Research Award*** Summer 2018

***Dean's List - First Honors (Every semester)*** Fall 2016 – Spring 2020

Awarded to students that are registered in at least three classes, with no grade lower than a B- and with a GPA over 3.8 at each given semester.

***Clark University Global Scholars Program*** Fall 2016 – Spring 2020

International scholarship for applicants who “demonstrated potential to provide leadership in their community and the world and who are committed to making a difference.”

## RESEARCH EXPERIENCE

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**LAMAT Research Fellow**, University of California, Santa Cruz, CA  
Astrophysics, Dr. Ramirez-Ruiz's Group Spring 2021 – Fall 2021  
Studied common envelope, stellar evolution, dynamics of binary systems; simulated hierarchical triple systems by placing binary inside of a common envelope and evolving it with a hydrodynamics code (FLASH); analyzed different stages of stellar evolution using MESA code.

**Undergraduate Research Assistant**, Clark University, Worcester, MA  
Biophysics, Dr. Petroff's Lab Spring 2018 – Spring 2020  
Built Arduino microprocessor systems for data collection and analysis; established protocols for collection and sampling of live bacteria samples; developed software for video processing and analysis using Matlab and Simulink Toolboxes; implemented PDMS synthesis techniques and plasma cleaning for microfluidics; conducted analysis of motion dynamics and collective arrangement of biological systems.

## TEACHING EXPERIENCE

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**Graduate Teaching Assistant**, Brown University, Providence, RI  
Physics Department Fall 2020 – Spring 2022  
Organized two weekly introductory physics lab sessions; taught five different labs focusing on Newtonian mechanics; led two weekly conference sections on electricity and magnetism; oversaw weekly office hours; graded over 100 lab reports and exams.

**Undergraduate Teaching Assistant**, Clark University, Worcester, MA  
Physics Department Fall 2017 – Spring 2020  
Coordinated and supervised daily night observations for astronomy; organized two weekly labs for introductory physics; cowrote and designed lab guides and protocols; evaluated student lab reports.

Mathematics Department Fall 2017 – Spring 2020  
Led weekly office hours in Calculus, Honors Calculus and Linear Algebra; coordinated individual and group study sessions; assisted faculty in evaluating student homework and tests.

Computer Science Department Spring 2018 – Spring 2019  
Conducted a minimum of 2 weekly lab sessions; led office hours in Intro to Computer Science (Python and Java) and Data Structures (Java).

## EXTRA CURRICULARS

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**Graduate Women in Physics**, Brown University Fall 2020 – Summer 2022  
Executive Board Member, Secretary  
Logistic organizer for the club; scheduled zoom meetings among club members; assisted in grant writing for department and APS grants; managed email lists and social media; led panels on navigating male-predominant field; served as graduate student representative.

**New Scientist Collective**, Brown University Fall 2020 – Spring 2022  
Graduate Student Mentor  
Provided peer mentoring, academic support, and professional development to students from groups traditionally underrepresented in STEM. Organized biweekly study sessions and discussions about race, gender, and cultural background in academia and industry.

**Women's Rowing Team**, Clark University Fall 2019 – Spring 2020  
Team Member  
NEWMAC Athlete of the Week May 2020  
2020 NEWMAC Rowing Academic All-Conference Student Athlete April 2020



## REFEREED PUBLICATIONS

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Petroff AP, **Rosselli-Calderon A**, Roque B, Kumar P. “Phases of active matter composed of multicellular magnetotactic bacteria near a hard surface.” *Physical Review Fluids* **7** (5) 2022.

## POSTER PRESENTATIONS

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**Rosselli-Calderon A**, Ramirez-Ruiz E, Murguia-Berthier A, Yarza R, Wallace-Everson R. *Understanding binaries in common envelope and the case study of pulsar triple system PSR J0337+1715*. Presented at: SACNAS National Diversity in STEM Digital Conference 2021. October 25–29, 2021; Virtual Meeting.

**Rosselli-Calderon A**, Petroff AP, Roque B. *Multicellular magnetotactic bacteria under an applied magnetic field form active crystals*. Presented at: APS March Meeting 2020. March 2–6, 2020; Denver, CO. (Meeting canceled due to COVID-19)

**Rosselli-Calderon A**, Mitchell C, Petroff AP, Roque B. *Compressing a swarm of multicellular magnetotactic bacteria with an applied magnetic field*. Presented at: APS March Meeting 2019. March 4–8, 2019; Boston, MA.

**Rosselli-Calderon A**, Mitchell C, Petroff AP, Roque B. *Compressing a swarm of multicellular magnetotactic bacteria against a wall with an external magnetic field*. Presented at: Conference for Undergraduate Women in Physics 2019: University of Massachusetts. January 18 - 20, 2019; Amherst, MA.

**Rosselli-Calderon A**, Mitchell C, Petroff AP, Roque B. *Distribution of multicellular magnetotactic bacteria against a flat wall*. Presented at: Clark University Fall Fest 2018. October 26, 2018; Worcester, MA.

## INVITED PRESENTATIONS

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Invited Panelist. *Navigating Male Dominated Spaces*. Presented at: APS Conference for Undergraduate Women in Physics. January 21-23, 2022; Virtual Meeting.