


# Martin Lopez Jr.

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## Education

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### University of California, Santa Cruz

*Santa Cruz, CA*

#### PHYSICS (ASTROPHYSICS) B.S., SUMMA CUM LAUDE

*2018*

- Advisors: Prof. Enrico Ramirez-Ruiz and Dr. Aldo Batta
- Overall GPA: 4.0, Highest Honors in the Major

### Mission College

*Santa Clara, CA*

- Overall GPA: 3.92

*2011 - 2015*

## Education and Volunteer Experience

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### K-8 Math Instructor

MATHSEED

*Fremont, CA*

*2019-Present*

### Math and Physics Academic and Test Prep Tutor

AJ TUTORING

*Palo Alto, CA*

*2019-Present*

### High School Spring Into STEM Day SLUG Lab Tour Host

STEM DIVERSITY

*UC Santa Cruz*

*2019*

### STEM Transfer Day SLUG Lab Tour Host

STEM DIVERSITY AND STARS

*UC Santa Cruz*

*2016-2018*

### COMET Mentor

STARS

*UC Santa Cruz*

*2016*

### Tutor, *Introduction to Scientific Computing*

LEARNING SUPPORT SERVICES

*UC Santa Cruz*

*2016*

### Free Tutoring Services, Math

MUSLIM COMMUNITY ASSOCIATION

*Santa Clara, CA*

*2015*

### Peer Mentor, *Arithmetic and Elementary Algebra*

AANAPISI

*Mission College*

*2014-2015*

### Tutor, Physics, Math, Statistics, Chemistry, and English

ACADEMIC SUPPORT CENTER

*Mission College*

*2014-2015*

## Subjects

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### MATH

- Arithmetic, Elementary/Intermediate Algebra, Precalculus, Calculus, Linear Algebra

### PHYSICS

- Mechanics, Electromagnetism, Thermodynamics, Fluids, Quantum Mechanics

### PROGRAMMING

- Python

## Research Experience

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### Junior Specialist

*UC Santa Cruz*

ADVISOR: PROF. ENRICO RAMIREZ-RUIZ

*2018-2019*

- Study the structure of binary black hole tidal disruption events using numerical tools such as SPH and FLASH.

## Undergraduate Research Fellow, Supercomputer Lab for Undergraduates

UC Santa Cruz

ADVISORS: PROF. ENRICO RAMIREZ-RUIZ AND DR. ALDO BATTÀ

2016 - 2018

- Use 3D Lagrangian hydrodynamic simulations and analytic methods to study dense stellar systems (globular clusters and galactic nuclei). Specifically, the physical and tidal interactions within them.

## Open Questions in Astrophysics Program

Niels Bohr Institute

ADVISOR: PROF. ENRICO RAMIREZ-RUIZ

2018

- Gain exposure to cutting-edge research in various fields of astrophysics such as high energy astrophysics, star formation, galaxy dynamics, and cosmology. Discuss issues of diversity and inclusion in the astronomy community.

## NBIA & DARK Summer School: Multi-Messengers from Compact Sources

Niels Bohr Institute

ADVISORS: PROF. ENRICO RAMIREZ-RUIZ AND DR. ALDO BATTÀ

2018

- Study how tools from an array of disciplines can be utilized to better understand gravitational wave and electromagnetic sources.

## Kavli Summer Program in Astrophysics

Niels Bohr Institute

ADVISORS: PROF. ENRICO RAMIREZ-RUIZ AND DR. ALDO BATTÀ

2017

- Study tidal disruptions of stars by LIGO binary black holes to understand the evolution of their individual spins.

## NSF Research Experience for Undergraduates, *Lamat*

UC Santa Cruz

ADVISORS: PROF. ENRICO RAMIREZ-RUIZ AND DR. ALDO BATTÀ

2016

- Study physical encounters between compact objects and red giants using analytical methods.
- Use order of magnitude estimates to calculate rates of collisions and significance of feedback energy on the system.

## Publications

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“Tidal Disruptions of Stars by Binary Black Holes: Modifying The Spin Magnitudes and Directions of LIGO Sources in Dense Stellar Environments”, **MARTIN LOPEZ JR.**, ALDO BATTÀ, ENRICO RAMIREZ-RUIZ, IRVIN MARTINEZ, JOHAN SAMSING. 2019, THE ASTROPHYSICAL JOURNAL, [ACCEPTED TO APJ](#).

“Probing the Black Hole Merger History in Clusters using Stellar Tidal Disruptions”, JOHAN SAMSING, TEJASWI VENUMADHAV, LIANG DAI, IRVIN MARTINEZ, ALDO BATTÀ, **MARTIN LOPEZ JR.**, ENRICO RAMIREZ-RUIZ, KYLE KREMER. 2019, PHYSICAL REVIEW D, [ACCEPTED TO PHYSREV D](#).

## Honors & Awards

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2019	Harvard Graduate School of Arts and Sciences Prize Fellowship
2017	UCSC Women’s Club Scholarship (Re-Entry Scholarship)
2016-2017	Ron Ruby Memorial Scholarship
2015-2017	Karl S. Pister Leadership Opportunity Award
2012-Present	Dean’s Honor List

## Presentations

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### Poster, High Energy Astrophysics Division 17th Meeting

Monterey, CA

*Tidal Disruptions by Binary Black Holes in Dense Stellar Systems*

2019

<b>Talk, Transient Lunch</b> TIDAL DISRUPTIONS OF STARS BY BINARY BLACK HOLES	UC Santa Cruz 2018
<b>Talk, TDE Meeting</b> <i>Tidal Disruptions by Binary Black Holes: Altering Birth Spin Magnitude and Direction</i>	UC Santa Cruz 2018
<b>Presentation, UC Board of Regents Meeting</b> <i>The Benefit of Undergraduate Research</i>	San Francisco, CA 2018
<b>Poster, American Astronomical Society 231st Meeting</b> <i>Understanding The Spin Evolution of LIGO Sources</i>	Washington, DC 2018
<b>Talk, Dynamically Assembled Binaries at the Beach Program</b> <i>Understanding The Spin Evolution of LIGO Sources</i>	UC Santa Cruz 2017
<b>Talk, Department Funding Presentation</b> <i>Red Giant Depletion Through Collisions in Dense Stellar Systems</i>	UC Santa Cruz 2017
<b>Talk, Prof. Ruth Murray-Clay Group Collaboration Presentation</b> <i>Red Giant Depletion Through Collisions in Dense Stellar Systems</i>	UC Santa Cruz 2017
<b>Poster, Undergraduate Research Symposium</b> <i>The Extermination of Stars Through Collisions</i>	UC Santa Cruz 2016

## Computational Skills

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### PROGRAMMING LANGUAGES

- Python
- C/C++
- MATLAB
- HTML
- CSS

### SUPERCOMPUTERS

- University of Copenhagen HPC@UCPH Cluster
- UC Santa Cruz Hyades Cluster

## Languages

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ENGLISH AND SPANISH (NATIVE)

ARABIC (INTERMEDIATE)