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Edgar Perez Vidal

Undergraduate Student Researcher

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Education

University of California, Berkeley, Berkeley, CA
B.A. in Physics and Astrophysics, GPA: 3.629/4.000 *expected Dec 2023*

Skills

Programming Languages	Python , LaTeX, LabVIEW
Technologies	GitHub, Adobe Lightroom and Photoshop, Google Drive.
Libraries	Numpy, Scipy, Astropy, PyTorch, Pandas, Astroquery, Jupyter, MatplotLib
Communication	Spanish (Native), English, French (elementary)

Research Experience

Astromatic Hackathon **Aug 2023**
Ciela Institute *Montreal, Canada*

- Selected as one of 16 participants for Astromatic 2023, a prestigious week-long program in Montreal that united undergraduate students worldwide interested in artificial intelligence, machine learning, and astrophysics.
- Engaged in lectures, workshops, hackathons, and a competition at the intersection of astrophysics and machine learning, fostering teamwork, creativity, and impactful project development. Program included career seminars, science talks, programming sessions, and networking events.

Institut de Recherche en Astrophysique et Planétologie (IRAP) **June 2023 — Aug 2023**
Research intern under Florian Sarron & Nicolas Clerc *Toulouse, France*

- Developed a galaxy cluster matching algorithm to find the SDSS Temple Groups associated with an x-ray emission detected by the XCLASS cluster sampled with confirmed spectroscopic redshift.
- Performed statistical analysis of the scaling relationship between the mass of the XCLASS galaxy cluster and the cosmic web filament connectivity using the skeleton provided by the SDSS.
- Confirmed simulations from the Eagle Project by comparing the distribution of the distance between the X-ray emission from the inter-cluster medium to its associated node in the cosmic filament, proving that the distance was proportional to the mass of the galaxy cluster.

Undergraduate Researcher **Feb 2022 — Present**
Nickel Observer and ZTF Checker under Alex Filippenko *Berkeley, CA*

- Zwicky Transient Facility Remote Checker: Our research group has joined the ZTF collaboration to discover supernovae candidates, my role is to check the data from the previous night I am assigned to and check for any interesting candidates and request followups for potential candidates
- Nickel 1 Meter Observer: Monthly overnight observer for the Nickel 1 Meter Telescope at Lick observatory
  - Fully Checked Out Observer for the Nickel & observed on the Nickel 15+ Nights
- Developed interactive software that tracks the evolution of the spectral features of normal Type Ia Supernova using our groups Supernova Database.

Professional Experience and Outreach

NSF International Center of Excellence (NICE) Cohort **Feb 2023 — Present**
Université Paul Sabatier, Toulouse III *Toulouse, France*

- Participation initiative through international research experiences in STEM. Emphasis on goal-oriented mentor-mentee pairing through the use of individual development plans.
- Selected to participate at the Institut de Recherche en Astrophysique et Planétologie (IRAP) associated with the Université Paul Sabatier and the Centre National de la Recherche Scientifique (CNRS).

NSF CAMP/LSAMP Pre-PhD Cohert **Feb 2022 — Present**
University of California, Berkeley *Berkeley, CA*

- University of California NSF California Alliance Minority Participation / Louis Stokes Alliance for Minority Participation in the Sciences (CAMP/LSAMP)
- Program designed to support underrepresented STEM students and support continuation onto graduate studies. This is accomplished through many professional development workshops, STEM faculty involvement, and a summer research camp with year-round funding.

Stellar Physics Course Reader **Aug 2022 — Dec 2022**
University of California, Berkeley *Berkeley, CA*

- Graded student problem sets and final research papers for an upper-division physics course.
- Provided detailed feedback and comments on student coursework on their methods and analysis, as well as programming and computational skills.

Academic Mentor **Feb 2021 — Dec 2022**
Calculus Round Table *Oakland, CA*

- Leading instruction of K-5 classrooms with 20+ students, as well as one on one tutoring for High school students on topics including biology, math, astronomy, and python programming in underprivileged schools in the West Contra Costa Unified School District.
- Developing curriculum, specifically on technology use, to effectively teach classroom during COVID-19 stay-at-home order.
- Worked closely with students from the Juvenile Justice Center in San Leandro and helped them come up with a plan to start a new life upon release.

Wolf Kitchen Manager **Aug 2021 — Aug 2022**
Berkeley Student Cooperative *Berkeley, CA*

- Uphold and Maintain professional kitchen standards for Wolf House (30 members)
- Budget $20,000 worth of Food and Supplies for the House, providing weekly budget reports for members.
- *ServeSafe Certified*

R.I.S.E Mentor **Aug 2020 — Sept 2021**
Berkeley High School *Berkeley, CA*

- Mentor and tutor students from underprivileged backgrounds and coach them to be college ready.

Research Projects

Derivation and Simulation of Photon Trajectory from the Schwarzchild Metric **Spring 2022**
Astro 161

- Final Research Project where I derived the photon trajectories of a none-rotating black hole using the Schwarzchild metric and simulated them using a python code. I presented my project in a research paper format along with a 30 second animation of the photon orbits.

Beat Frequency Metal Detector **Spring 2022**
Physics 111a

- Final intro to electronics project where I created a beat frequency metal detector using circuit elements such as op-amps, mixers, feedback loops, and JFETS. Tuned metal detector using software programs such as Dilgent, LabView, and SPICE.

Stellar Environment and Its Influence on Super Massive Blacks Holes **Fall 2021**
Astro 160

- Final Research paper where I contemplated the origins of Super Massive Black Holes at the center of Galaxies by referencing peer reviewed papers from the Astrophysical Journal and creating an original figure of the M-σ Relationship.

Gravitational Lensing Project **Fall 2021**
Python Decal

- Exploration group project on the topic of Gravitation Lensing. We created figures that plotted the Einstein Angle in terms of Lens Mass, and magnification of different mass lenses using python. After collecting all the figures, we presented a findings including computational methods and figures to our Python Decal Class and course staff.

Research Talks & Posters

- **Special Merit Award** received at the 2023 NSF CAMP Statewide Symposium for my research talk: Population Study of the Velocity of Silicon II Lines in Type Ia Thermonuclear Supernova Explosions.
- **First Time Attendee** and fully funded by UC Berkeley at the National Diversity in STEM held in Puerto Rico and hosted by SACNAS in October 2022.

Activities

- Hispanic Engineers and Scientist
- Undergraduate Astronomy Society member