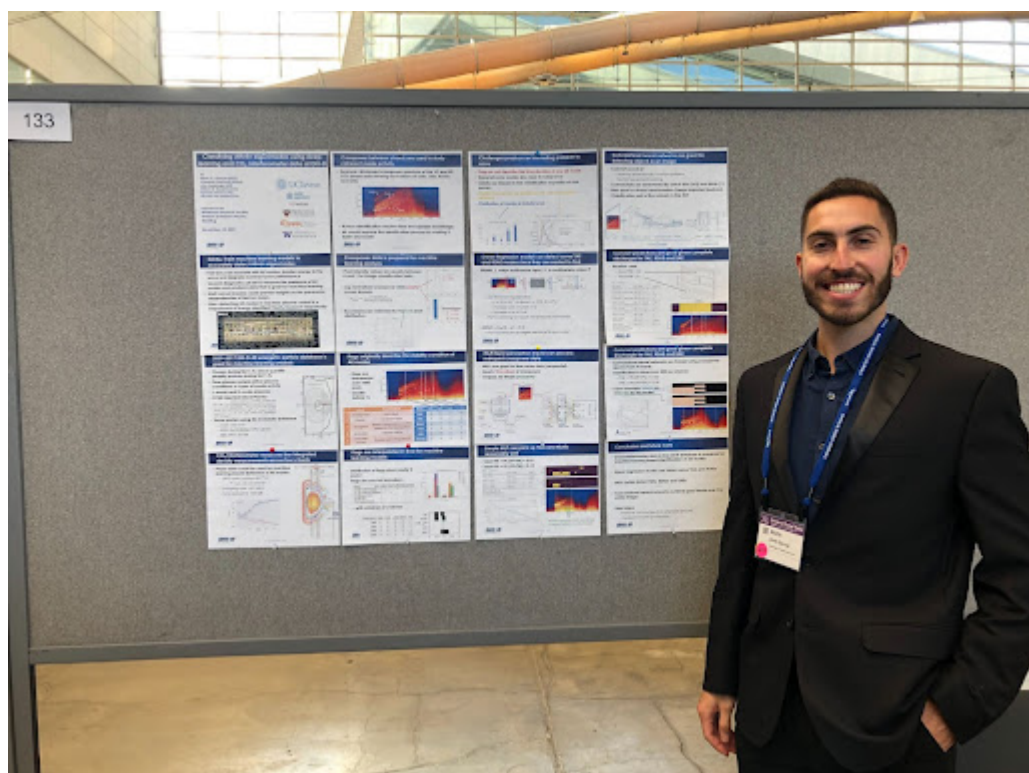


## 2022 Winter Quarter Newsletter

Volume 4, Issue 2

### Student Spotlight



Alvin Garcia is a 5th year Plasma Ph.D. student who was recently awarded the prestigious U.S. Department of Energy (DOE) Office of Science Graduate Student Research fellowship (SCGSR) for his work using machine learning to classify plasma wave modes in experimental data produced at the DIII-D National Fusion Facility. Through the fellowship, Alvin is provided with access to the expertise and resources available at DOE national laboratories. Alvin developed the proposal from his own vision while still attending and presenting at the American Physical Society (APS)–Division of Plasma Physics Virtual Meeting. Alvin says his ideal first job after graduation would be to continue building machine learning models that tackle fusion energy problems and eventually hopes to become a leader in sustainable nuclear fusion in the future.

Read the full spotlight [here](#).

We are taking nominations for the Student Spotlight! If you want to nominate a graduate student you know, you can do so using the google form located [here](#).

### Question of the Quarter

Thank you to everyone who participated in our question of the quarter!

See our results below and please take a brief moment to answer our question for the next newsletter:

## "What does your ideal work situation look like, from home or the office?"

The newsletter is also collecting information about undergraduate seniors' plans for the future. If you plan to graduate this academic year, fill out [this form](#) to let us know what you plan to do next. Responses are anonymous, and will be featured in the next newsletter.

### Question of the Quarter:

#### Who is your favorite scientist and why?

Albert Einstein

**Marie Curie:** Despite being consistently put down and disregarded by her male colleagues for being a female scientist, she never gave up on her pursuit of higher education and ended up being the first ever female Nobel Prize winner. On top of that she didn't leave it there, she went on to win the Nobel Prize AGAIN later on in her life.

Richard Feynman

**Carl Sagan:** He brilliantly explained difficult topics, brought a sense of wonder to the listener, and advocated for a unified human race.

Galileo Galilei

**Michael Faraday:** Despite having little formal education, he made some very significant contributions to physics.

Carl Sagan

**Enrico Fermi:** I like that he was an experimentalist and theorist at the same time.

Emmy Noether

**Hank Green:** I'm a zoomer on tiktok.

**Guillaume Le Gentil:** Because he tried so hard and got so far, but in the end it didn't even matter. To explain a bit more, he was a french astronomer in the 1700s who wanted to observe the transit of Venus across the Sun, a super rare event that only happens twice every 122 years and, if measured, would have allowed him to measure the distance of earth from the sun for the first time EVER. He gave up everything to travel to India to observe it and was struck with every possible calamity along the way--storms, shipwrecks, plague, war, blockades, passport troubles, the whole kitchen sink. He ends up missing the first transit entirely, being stuck on a moving boat that meant he couldn't get any measurements at all. Not deterred, he stuck around for another eight years to wait for the next transit.... and this time a huge bank of clouds rolled in just as it was starting. He missed it AGAIN. When he finally got home to Paris, eleven years after he had left, he found that he had been legally declared dead and his estate had been dissolved. Talk about bad luck.

Marie Curie

Nikola Tesla

Michael Faraday

Enrico Fermi

Carl Friedrich Gauss

Hank Green

Benjamin Whisooh Lee

Stephen Hawking

Max Planck

Guillaume Le Gentil

Joseph-Louis Lagrange

Erwin Schrödinger

Linus Pauling

Paul Dirac

Zhenning Yang

*"That is the fate that often awaits astronomers. I had gone more than ten thousand leagues; it seemed that I had crossed such a great expanse of seas, exiling myself from my native land, only to be the spectator of a fatal cloud which came to place itself before the Sun at the precise moment of my observation, to carry off from me the fruits of my pains and of my fatigues..."*

- Gentil's personal journal

### Research Content

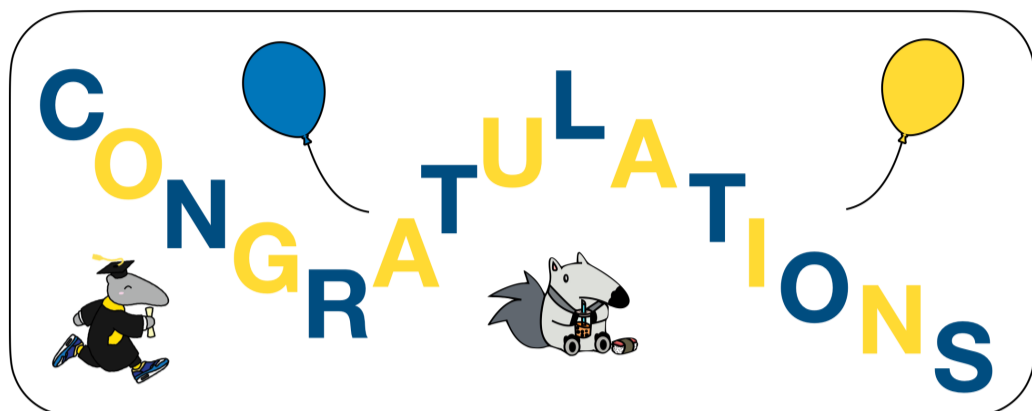
A team of UCI physicists led by Prof. Ochoa-Ricoux recently published in Nature Communications Physics as part of the LiquidO consortium. They are pioneering a novel detection technique that uses opaque scintillators to enable particle interaction imaging down to the ~cm level. Its capabilities afford it a wide range of applications in many areas of high-energy, nuclear, medical, and accelerator physics, many of which are under active exploration. You can read more about LiquidO [here](#).

UCI was well represented at the 17th IAEA Technical Meeting on Energetic Particles and Plasma Instabilities. 4 graduate students (Genevieve DeGrandchamp, Kenny Gage, Daniel Lin, and Alvin Garcia) and 4 post-docs (Javi Gonzalez-Martin, Jeff Lestz, Guillaume Brochard, and Pengfei Liu) presented invited talks at the conference. The topics covered included studies on plasma diagnostics at the DIII-D tokamak, and MHD simulations for DIII-D and the upcoming ITER facility.

Prof. Jin Yu recently published a paper in the Proceedings of the National Academy of Sciences on the diffusion of transcription factor proteins along strands of DNA. This work helps us understand the physical mechanisms behind gene regulation in living organisms. Prof. Yu will also present on this work at the upcoming Biophysical Society meeting in San Francisco. You can read the paper [here](#).

Ph.D. student Kevin Andrade, along with fellow UCI researchers (Jackson Fuson, Sophia Gad-Nasr, Demao Kong, M. Grant Roberts, and Manoj Kaplinghat), recently published a paper in the Monthly Notices of the Royal Astronomical Society. They analyzed strong lensing in 8 galaxy clusters to place a stringent upper limit on the dark matter self-interaction cross section. You can read the paper [here](#).

## Department News



Congratulations to the following Ph.D. students who recently defended their theses since our last newsletter publication!

**Dr. Jingyi Yang:** "Metasurfaces and Zero-Index Photonics in Optical Fibers"

**Dr. Kevin Andrade:** "Looking Into the Cores of Galaxy Clusters and Dwarf Galaxies"

**Dr. Jacob Hollingsworth:** "Machine Learning Applied to Parameter Spaces of Theories Beyond the Standard Model"

**Dr. Randy Sawaya:** "Constructing Hubbard Models for the Hydrogen Chain"

**Dr. Taylor Faucett:** "Decoding Black Box Models for New Physics at the LHC"

---

Professor Shields educational outreach program (Rising Stargirls) was recently featured by the School of Physical Sciences: <https://ps.uci.edu/news/2559>

---

Check out the [recent post](#) on the UCI Physics and Astronomy blog highlighting the work of Prof. Xiaoqing Pan's materials science research group in using electron microscopy to understand how defects in crystals affect phonon modes.

---

Check out UCI Post-Doc Yu-Dai Tsai's popular interview discussing asteroids as a probe for a 5th force of nature [here](#)!

---

# Guess The Plot!



Corey

## Astronomy and Astrophysics Edition

See what happens when physicists are forced out of their comfort zone! You might think that all physics is the same, but different sub-fields of physics can actually be very different. [In this video](#) you can watch what happens when UCI Physics and Astronomy graduate students have fun guessing a plot from a different field of physics!

This is the first video in a new Blog Team series called “Guess the Plot!”. If you would like to participate as a future plot “guesser” [fill out this brief form](#), if you have any other thoughts or feedback please [submit it here](#).

---

Interested in communicating science to a public audience? The UCI Physics and Astro Blog is accepting guest submissions of “bite-sized” physics articles to feature on our website! These are short, jargon-free articles on some aspect of physics or astronomy, whether it be a recent [research paper](#) or [something more creative](#). Anything aimed at a broader audience is welcome to be considered. You can send an email to [physastroblog@uci.edu](mailto:physastroblog@uci.edu) with any submissions, ideas, or questions about writing a guest article.

## Events

The 2022 admitted graduate student visit days will be February 25th and March 11th! The February date will be conducted online, and the March date is TBD.

---

There will be no MVP speaker this quarter, stay tuned for the next MVP in the spring!

---

UCI physics and astronomy graduate students are recording their 3-minute research pitches for the Grad Slam competition this week. Make sure you tune in to the UCI Grad Slam Finals on March 3rd to see if they make it through! To learn more about the UC’s Grad Slam competition check out [here](#).

## Resources

Want to learn more about managing your research data? Check out UCI library’s workshops and programs for this year’s [UC Love Data Week](#). Presentations and workshops focused on data access, management, security, sharing, and preservation will run all week long from February 14th to 18th. Find more information and register [here](#)!

---

To keep up to date on department seminars and colloquia, you can subscribe to the seminar listserv to get announcements in your inbox. Subscribe here: <https://maillists.uci.edu/mailman/listinfo/physics-astronomy-seminars>

---

Thinking of going to graduate school, or want some research experience at another institution? Check out the Research Experience for Undergraduates program (REU)! You can find a list of sites hosting REU's in physics [here!](#) Applications are due soon!

---

It has been well over a year since this pandemic started, and it still remains important to remember to take care of your wellness through these times. UCI Be Well offers a tool here at this website (<https://bewell.uci.edu/>) for searching UCI wellness programs and initiatives for students, faculty, and staff.

---