



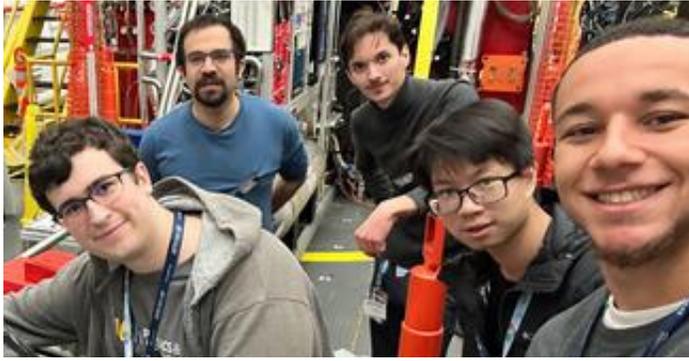
Greetings! In 2023, the UCR Department of Physics and Astronomy thrived amidst great achievements and difficult challenges. On October 24, President Joe Biden awarded Nobel Laureate Professor Barry Barish the National Medal of Science. Professor Roya Zandi was honored as a fellow of the American Physical Society. We hired two new faculty members this year. Professor Andrew Joe joined us in August, and Professor Steve Choi will join us in January 2024. Finally, we are proud of the class of 2023, where we awarded 23 Ph.D. and 39 B.Sc. degrees. I invite you to browse through the newsletter to learn more about some of the exciting developments in the Department.

Prof. Shan-Wen Tsai, Chair  
Department of Physics and Astronomy  
College of Natural and Agricultural Sciences  
UC Riverside

Gifts from alumni and former colleagues help expand what we can offer to our students and the research and teaching activities we do.

As 2023 comes to a close and we reflect back on this year, we are grateful to the support of our community of alumni and friends. We are always pleased to hear about your news and welcome you to visit us.

Happy Holidays!



## PHYSICS STUDENTS GAIN HANDS-ON EXPERIENCE IN BUILDING A PROTOTYPE DETECTOR

---

### HIGH SCHOOLERS GET UNIVERSITY-LEVEL EDUCATION IN PARTICLE PHYSICS

Fifteen students from Ramona High School and 12 from Hemet High School got to learn some of the latest findings in particle physics when they visited UC Riverside on Monday and Tuesday this week.



### A MANUAL FOR ENGINEERING SPIN DYNAMICS IN NANOMAGNETS

"The magnons interact with each other, thus constituting nonlinear spin dynamics," said [Igor Barsukov](#)

### THREE HIGHLANDERS RECEIVE 2023 BARRY GOLDWATER SCHOLARSHIP

Five thousand U.S. higher-education students applied, 1,267 applicants moved on to be nominated, and 413 of those nominees were awarded the 2023 [Barry Goldwater Scholarship](#) – *one of them being our own student, Peter Carney.*





## POSTDOC WINS PRESTIGIOUS FELLOWSHIP

The one-year, \$36,000 fellowship will allow Paul to further research of the [Electron-Ion Collider](#), or EIC, a unique physics research facility dedicated to answering fundamental questions about nature's building blocks.

## HOW DOES PHOTOSYNTHESIS WORK SO EFFICIENTLY?

The trio zero in on [photosynthesis](#), the process by which green plants and some other organisms use sunlight to synthesize foods from carbon dioxide and water and where the configuration of a plant's photosynthetic antenna arrays makes light energy chemically available to the plant.



Prof. Nathaniel Gabor

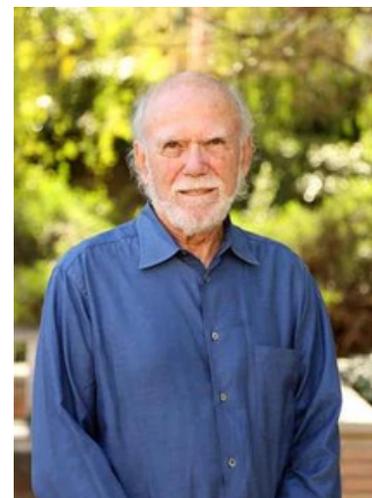


## STAFF MEMBERS HONORED AT AWARDS CEREMONY

Department FAO, Guille Vallejo  
*(pictured in the center)*

## PHYSICIST RECEIVES HIGH HONOR FROM ROYAL ACADEMY OF SCIENCES AND ARTS OF BARCELONA

Physicist [Barry C. Barish](#), a distinguished professor of [physics and astronomy](#) at UC Riverside who won the [2017 Nobel Prize in physics](#) for the discovery of gravitational waves, has been elected a corresponding member of the Royal Academy of Sciences and Arts of Barcelona. Founded in 1764 as a private literary society to promote the arts and science, the Spanish academy is an association of scholars in science and its applications.





## SUMMER SCHOOL FOCUSES ON NUCLEAR PHYSICS

---

### NEW TEACHING TECHNOLOGY OPENS A WORLD OF POSSIBILITIES

With a touch of the screen, new interactive video technology at UC Riverside's XCITE Center for Teaching and Learning allows students to explore countless learning opportunities.



### UCR IS A KEY PLAYER IN CONCEPTUAL DESIGN

"Jonathan Richardson, an assistant professor of physics and astronomy, will lead the design of an adaptive optical sensing and controls system critical to enabling Cosmic Explorer.

### NSF GRANT ALLOWS PURCHASE OF INSTRUMENT FOR MEASURING MAGNETIC PROPERTIES



Prof. Jing Shi



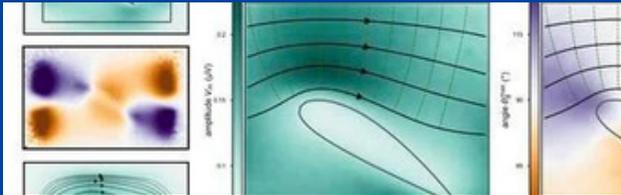


Prof. Bahram Mobasher

## ASTRONOMY GRANT WILL STRENGTHEN TIES BETWEEN UCR AND UNIVERSITY OF HAWAII

### PHYSICS STUDENTS WIN PRIZES AT INTERNATIONAL CONFERENCE

UC Riverside physics students [Sean Preins](#) and [Peter Carney](#) were awarded prizes at an international conference that took place 25-31 July at the University of Warsaw in Poland.



### ELECTRONS TAKE FLIGHT AT THE NANOSCALE

### UCR PHYSICIST AWARDED NATIONAL MEDAL OF SCIENCE

Physicist [Barry C. Barish](#), a distinguished professor of [physics](#) and [astronomy](#) at UC Riverside, was awarded the National Medal of Science by President Joe Biden at a [ceremony held at the White House](#) today.



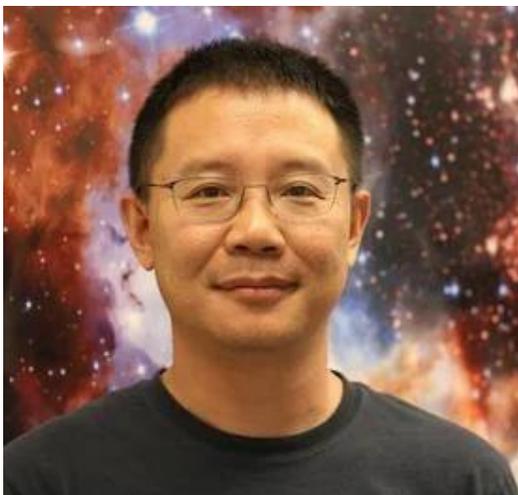


## **MILKY WAY-LIKE GALAXY FOUND IN THE EARLY UNIVERSE**

Using the James Webb Space Telescope, an international team, including astronomer [Alexander de la Vega](#) of the University of California, Riverside, has discovered the most distant barred spiral galaxy similar to the Milky Way that has been observed to date.

## **PHYSICS GRADUATE STUDENT WINS MERIT AWARD AT NATIONAL LAB**

[Xilin Liang](#), a graduate student working with [Kenneth Barish](#), a professor of [physics and astronomy](#) at UC Riverside, has been awarded a [RHIC & AGS merit award](#) by Brookhaven National Laboratory for his “contributions to the STAR forward calorimeter and simulations for the EIC.”



## **NEW DARK MATTER THEORY EXPLAINS TWO PUZZLES IN ASTROPHYSICS**

In [work published in The Astrophysical Journal Letters](#), a research team led by [Hai-Bo Yu](#), a professor of [physics and astronomy](#) at the University of California, Riverside, reports that SIDM simultaneously can explain two astrophysics puzzles in opposite extremes.



## **BRINGING VIRTUAL REALITY TO NUCLEAR AND PARTICLE PHYSICS**

Virtual reality, or VR, is not just for fun-filled video games and other visual entertainment. This technology, involving a computer-generated environment with objects that seem real, has found many scientific and educational applications as well.

Sean Preins, a doctoral student in the Department of Physics and Astronomy at the University of California, Riverside, has created a VR application called VIRTUE, for “Virtual Interactive Reality Toolkit for Understanding the EIC,” that is a game changer in how particle and nuclear physics data can be seen.

According to Miguel Arratia, an assistant professor of physics and astronomy at UCR who advises Preins, VR technology will enable a completely new way to explore particle and nuclear physics data in both space and time.



## **PHYSICIST NAMED FELLOW OF THE AMERICAN PHYSICAL SOCIETY**

Roya Zandi, a professor of physics and astronomy at UCR, has been named a fellow of the American Physical Society, a non-profit organization that advances knowledge of physics.

Fellowship is a distinct honor signifying recognition by one's professional peers. Each year, no more than one half of one percent of the society's membership is recognized by their peers for election to the status of fellow of the society.

# WELCOME NEW FACULTY



## SHAWN WESTERDALE

---

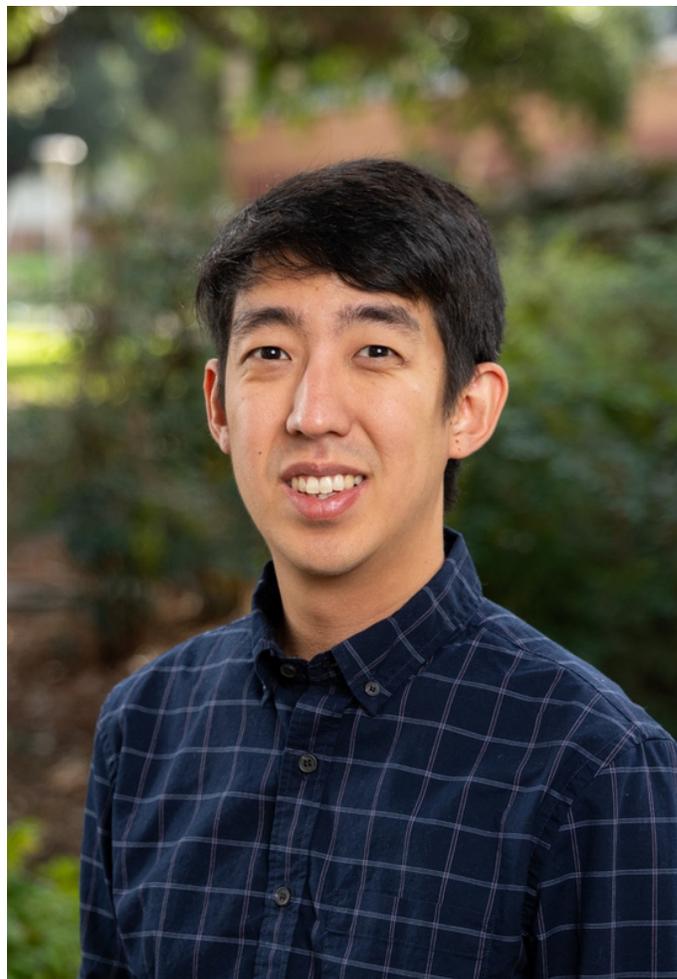
Shawn joined the department in Fall 2022 as part of the Experimental Cosmology and Particle Physics group. He completed his undergraduate studies at MIT and his PhD at Princeton, and he did postdoctoral research at Carleton University in Ottawa, Canada, INFN Cagliari in Sardinia, Italy, and Princeton. His research primarily focuses on dark matter direct detection, with a secondary focus on neutrino physics. He works on the design and analysis of current and upcoming argon-based experiments, and R&D for future detectors. He's excited for the upcoming commissioning of his next detector, DarkSide-20k. His fun fact is that another experiment he works on, DEAP-3600, is located at SNOLAB, which is 2 km underground in an active nickel mine. One of the many things that makes this lab special is that it has the world's deepest underground flushing toilets.



# ANDREW JOE

---

Andrew Joe is an Assistant Professor in the Department of Physics and Astronomy. He received his B.A. in Physics from Cornell University and earned his Ph.D. in Physics from Harvard University. Before joining UCR, he was a postdoctoral researcher at UC Berkeley and Lawrence Berkeley National Lab. Andrew's work focuses on using optical and optoelectronic techniques to study novel electronic and excitonic states in 2D materials. At UCR, he plans to use these techniques to study the underlying physics behind new types of 2D material heterostructures and develop the next generation of optoelectronic quantum devices.



# STEVE CHOI

---

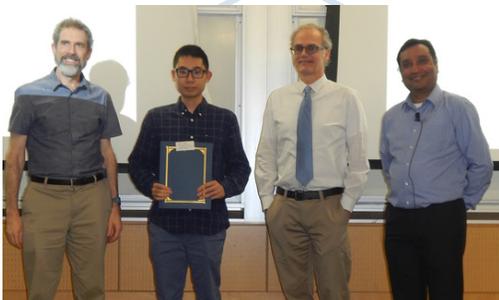
I completed my B.S. in Physics at UC San Diego and earned my Ph.D. in Physics from Princeton University. Prior to joining UCR, I was an NSF Postdoctoral Fellow at Cornell University. My main focus is in experimental and observational cosmology, particularly in the development of superconducting detectors for precise observations of the microwave sky. I also enjoy analyzing and interpreting the sky data for new cosmological constraints. At UCR, I am excited to develop more sensitive astronomical instrumentation to help address fundamental questions about our universe.

2023

# GRADUATION

CLASS  
OF  
2023

CONGRATS TO OUR GRADUATES!



# GRADUATE **RECOGNITION**

**CLASS  
OF  
2023**

## **OUTSTANDING TEACHING ASSISTANT**

ARCHANA ARAVINDAN  
EN-DE CHU  
BRIAN FRANCISCO  
JUSTIN BARBER  
YINAN DONG  
ADAM GREEN  
JIA-MOU CHEN  
HENOC EJIGU

## **ALBERT STAATS AWARD FOR EXCEPTIONAL SKILLS IN DESIGNING AND BUILDING PHYSICS APPARATUS**

SEANS PREINS

## **BENJAMIN C. SHEN MEMORIAL AWARD - OUTSTANDING 1ST YEAR GRADUATE STUDENT**

YANKANG LIU

## **ANNE KERNAN AWARD - OUTSTANDING JUNIOR GRADUATE STUDENT RESEARCHER**

MING-FENG HO AND XILIN LIANG

## **ROBERT T. POE MEMORIAL SCHOLARSHIP AWARD FOR OUTSTANDING PHD GRADUATE**

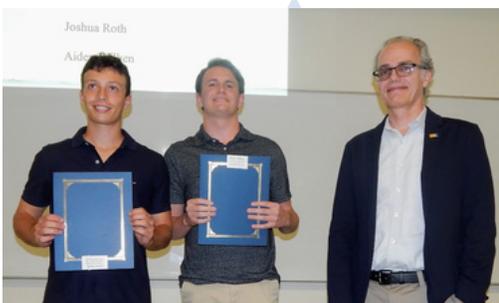
CHRISTOPHER CAIN

2023

# GRADUATION

CLASS  
OF  
2023

CONGRATS TO OUR GRADUATES!



# UNDERGRADUATE **RECOGNITION**

**CLASS  
OF  
2023**

## **ROBERT L. WILD FAMILY AWARD – OUTSTANDING 1ST YEAR UNDERGRADUATE STUDENT**

ABBHEY MORENO  
JIAAN ZHANG

## **BROWN WILLIAMS ENDOWMENT AWARD – OUTSTANDING 2ND YEAR UNDERGRADUATE STUDENT**

SAMIR KULKARNI  
SHANE LEVIN  
MATTHEW LUGATIMAN

## **R. STEPHEN WHITE ENDOWMENT AWARD – OUTSTANDING 3RD YEAR UNDERGRADUATE STUDENT**

PETER CARNEY  
JARED HUDNALL  
JOSHUA ROTH  
AIDEN WILKIN

## **R. STEPHEN WHITE ENDOWMENT AWARD – OUTSTANDING SENIOR UNDERGRADUATE**

JUSTIN BURZACHIELLO  
ALEXANDER CLARK  
JIAJUN HUANG

# DEPARTMENT EVENTS



**CNAS NEW FACULTY RECEPTION**

**FALL RECEPTION**



# Physics and Astronomy Holiday Party



NOVEMBER 1ST, 2022

# STEPHEN WIMPENNY

Professor of Physics



Steve was very active in administrative affairs at UC Riverside. He served as Physics and Astronomy Undergraduate Advisor for many years and served on numerous Academic Senate committees. He chaired both the Courses committee (2001) as well as Educational Policy (2015-2016). He also served on the Privilege and Tenure, Preparatory Education, and Academic Personnel committees.

Professor of Physics Stephen Wimpenny passed away on November 21, 2022. He joined the University of California, Riverside in 1987. He was an influential leader in experimental high energy physics and played a leading role in the discovery of the top quark in 1995 by the DZero and CDF Collaborations and studies of its properties by the CMS collaboration.

Steve was born in 1956 in the United Kingdom. He attended the University of Sheffield for both undergraduate and graduate studies, receiving his Ph.D. in 1980. From 1980-84 Steve was a postdoctoral researcher at the University of Liverpool where he worked on the CERN EMC muon scattering experiment. Steve then became a CERN Research Fellow (1984-87) and transitioned to the UA1 experiment where he led studies of the muon decays of the newly discovered W and Z bosons. In 1987 Steve came to UC Riverside and joined the physics faculty in 1988. He began work on the DZero experiment, which was being constructed at the Tevatron collider at Fermilab. Working at DZero, Steve made important contributions to the muon detector construction, installation, and operation. He soon became leader of the group searching for signatures of the elusive top quark in decays to leptons (electrons and muons), and he played a central role in the discovery of the top quark in 1995 by the DZero and CDF Collaborations. He led the DZero Top Quark Dilepton Analysis group from 1992-96 and continued as a leader in top quark physics in DZero and later at the CERN Large Hadron Collider.

# GIVING

---

Gifts of any size to the Department of Physics and Astronomy are deeply appreciated. Even small gifts will help to support our student programs, as well as resources for graduation. Please see the website link or QR code below for more information. Thank you for your generous support.



**SCAN THIS QR CODE TO GIVE**  
**OR CLICK HERE FOR THE LINK**

**ALBERT STAATS FUND**

**ANNE KERNAN ENDOWED FUND  
FOR PHYSICS**

**BENJAMIN C. SHEN ENDOWED  
FUND IN PHYSICS**

**BROWN WILLIAMS ENDOWED  
UNDERGRADUATE STUDENT AWARD  
FUND**

**DR. THOMAS HALSEY ENDOWED  
SCHOLARSHIP FUND**

**HARRY GREEN GEO-PHYSICS  
GRADUATE ENDOWED AWARD  
FUND**

**PHYSICS AND ASTRONOMY  
DEPARTMENT**

**R. STEPHEN WHITE ENDOWED  
FUND FOR PHYSICS**

**ROBERT WILD FAMILY ENDOWED  
SCHOLARSHIP FUND**

**SUN-YIU AND HELEN FUNG  
ENDOWED GRADUATE STUDENT  
FELLOWSHIP FUND**

*This newsletter was assembled and designed by Arianna Mondragon. We would like to thank the Department of Physics and Astronomy staff for their assistance, Iqbal Pittalwala for the use of his news pieces, and the students and faculty who contributed articles, photos and other content.*