

2019-2022

Newsletter



Department of Physics & Astronomy
California State University, Long Beach





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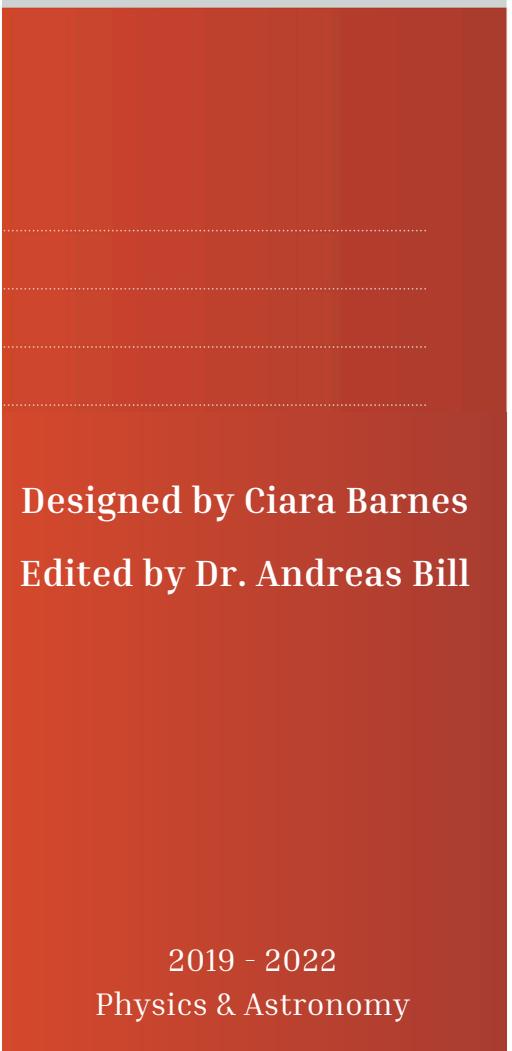


2019- 2022 - Physics & Astronomy

In This Issue



Years in Review Andreas Bill	04	KEMP T. Gredig, M. Peterson	19
New faculty: A.R. Klotz	07	PhysTEC C. Kwon, L. Henriques, G. Pickett	20
The Staff	08	Learning Assistants Galen Pickett	21
Undergrad & grad programs J. Gu, P. Jaikumar	10	Society of Physics Students M. Usufzy, R. Savedra, M. Mackenzie	22
Working in the Pandemic Andreas Bill	11	Women in Physics & AstroClub	24
Distinguished lecturer Dr. Alex Szalay	15	Where are They Now? Dept. alumni testimonies	26
NSF - PREM M. Peterson, J. Gu, R. Blair	16	Retirements & In Memoriam	32
APS Bridge Program A. Bill, G. Pickett, C. Kwon	17	Commencement Awards, Scholarships, Fellowships, Assistantships	37
APS IDEA, Innovation fund Galen Pickett	18	Donor and Alumni Giving	39



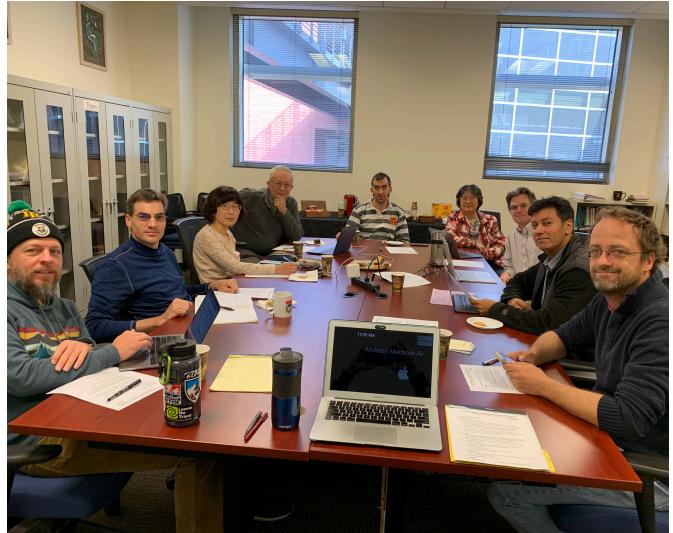
YEARS IN REVIEW

Andreas Bill



Above : faculty zoom meetings during COVID

Right: last in person faculty meeting in Feb. 2020



Dear Colleagues, Alumni and Friends of the department

Academic year 2019-2020 started well. And then, everything changed!

We were prepared. Somewhat...

This letter summarizes the academic years 2019-2020, 2020-2021 and 2021-2022. The combined letter is a consequence of the pandemic and other events that drastically affected our lives and the activities of the department.

Fall 2019 started my second term as department chair. As can be read in the previous newsletter, the department had many activities underway and ideas to be realized in the near future. Covid-19 affected every part of our lives and the work we do at the department. It has lasting effects. Also, social issues leading to the MeToo and Black Lives Matter movements shook the status quo of a society that became complacent and slow to move in its efforts to provide recognition, opportunities and equity for all members of our society.

The Pandemic

When March 2020 came, we were somewhat prepared at the department. We took seriously the warnings of Public Health instances worldwide and of the Center for Disease Control and Prevention (CDC). We anticipated that at some point we may have to close offices for a time but keep the activities and work from home. As a result, starting with the Spring 2020 semester, I organized meetings in groups for tenured and tenure-track faculty, faculty lecturers, teaching associates and graduate assistants (TA/GA), and for staff to focus on what to do should the campus close but the university remain open. How should we teach classes? How can we do laboratory classes at a distance? How can we continue our research work?



YEARS IN REVIEW

Andreas Bill



While the university administration dealt with the infrastructure needed for students to take classes online, from home, our department dealt with what material each of us needs to teach in that format. Our last preparation meeting took place with faculty teaching lower division labs on March 11, 2020. On March 13, the campus closed, not to return until the Fall 2021. To this day I am grateful that we had time to discuss in person how we should work online! Faculty, staff and students cooperated, and it did feel like the physics community came together as a family. Everyone contributed to make the transition as least painful as possible and address the many challenges as they came along.

The teaching format had to be rethought. Galen Pickett and Montserrat Geier organized summer workshops for faculty to engage in good practices for alternative modes of instruction. Almost all faculty attended the workshops and showed dedication in doing the best teaching possible under the circumstances. An article of this letter summarizes the efforts of the department to provide the highest quality in teaching given the circumstances of the pandemic.

As department chair, the Covid-19 time has represented a large increase in workload and time spent to make sure everyone had the necessary tools to work, the necessary mindset to make it successful and the necessary support to be empowered and approach the whole situation in a positive way. To keep the cohesion of the department built over the years it was important to meet weekly in groups and individually over zoom to share about life, work, challenges and needs: we had separate meetings for staff, for tenured/tenure-track faculty on Wednesdays, and lecturer faculty on Fridays. Members of these groups were also lab coordinators and they had their own weekly meetings with TAs and GAs. In addition, using special software, we organized the online Holiday Party, the Scholarships and Assistantships “zoom-dinner”, and the Graduation Celebration of the department at the end of two academic years.

One outcome of this experience is that meeting in person allows information to be conveyed faster, more accurately, with a better understanding of each person's state of mind, leading to less misunderstandings. Zoom meetings and email exchanges are definitely useful but can be more time-consuming and less effective than meeting in person!

Equity in Education

The “Me Too” and “Black Lives Matter” movements and other issues highlighting the despair by groups of the population not to see more equity and recognition in society became prominent during the time of the newsletter. These movements raised consciousness of a larger portion of the population to the systemic issues faced by underrepresented ethnic and racial minorities and by women. Our department has a record for working on the matter with quite a few successes. From 2010 to 2019 we hired five tenure-track faculty; among them one black physicist, and one Latina physicist.

YEARS IN REVIEW

Andreas Bill

As explained in the self-study submitted in 2022, while low when considering the representation of each group in society, our department has a quite diverse pool of hired faculty for US universities (including PhD programs, MS granting institutions, and liberal arts colleges) given the number of black, African-American, LatinX and Native American physicists who had a PhD in physics and were interested in academic careers.

Since 2010 the department faculty has actively been engaged in grappling with issues of equity and inclusion. As a result in 2014 we were one of only five Physics departments in the nation to be selected as a Bridge Site of the American Physical Society (APS). The purpose of the APS Bridge Program is to address access gaps in graduate programs and provide a constructive pathway for the transition of underrepresented groups in physics to PhD programs.

Over the years, and together with other bridge sites and the APS leadership, our department contributed to change the face of the physics community. We positively impacted the mentality of faculty and staff, and developed tools to be able to admit students on a more holistic basis and to allow all students of the department to integrate the community, find support through mentoring and other practical means, and thrive. Self-motivation and the diverse composition of faculty at the department led us to work on improving equity and inclusion. The department efforts have strongly contributed to elevate the overall quality and level of our undergraduate and graduate programs.

What else happened?

This letter reports on many more news, among which I will point out the hiring of Alexander Klotz specialized in soft condensed matter physics, and the establishment of two new partnerships. One with Google Inc., to support our APS Bridge Program Fellows and provide a variety of activities supporting all students and the department. The other is the NSF Seed grant awarded to start the Partnership for Research and Education in Materials (PREM) together with the departments of Chemistry & Biochemistry, Mathematics & Statistics, and the department of Physics at The Ohio State University.

The time covered by this newsletter and my work as department chair has ended with the writing of the self-study (contact me for details). The over hundred-page document summarizes the numerous achievements of the department during the past 8 years and how the university can help the department continue thriving. These years have truly been unique through the challenges faced and through our achievements. Our department is in an excellent state, except for its far too low number of tenured and tenure-track faculty. Paraphrasing the recent statement of one of the younger faculty, the department has really become a place where students can reach excellence, where equity is integral part of the life of the department, and where research plays an essential role in the professional training of the next generation of physicists.

As always, we hope to hear from you and enjoy welcoming you in person at the department!





DR. ALEXANDER R. KLOTZ

New Tenure-Track Faculty

Dr. Alexander (Alex) R. Klotz joined the department faculty in August 2019. He received his Ph.D. in Physics in 2015 from McGill University, in Montreal, Quebec, Canada. He was an NSERC postdoctoral fellow at MIT since 2015. During his doctoral time, he also worked as a Public Health Analyst at Medmetrics Inc.

Dr. Klotz brings an important expertise to our department: soft condensed matter physics. The novelty of his approach is to use biological polymers to understand the physics of soft materials. Using optical microscopy and microfluidics techniques, as well as computer simulations, he studies biological materials to infer knowledge of non-equilibrium thermodynamics and physics of materials. He is particularly fascinated by the large diversity and complexity of the living world. He aims both at understanding the physics of these materials and imagine potential technological applications of the physical and chemical principles he studies. Among the current and upcoming topics of research are the study of topological chemical bonds of DNA chainmail networks (kinetoplasts) with a particular interest for molecular knots, polymer dynamics in active fluids and the nanotechnology of biological machines.

Next to the main topic of research Dr. Klotz also published in the field of public health and on pure physics topics. One of these papers published in the American Journal of Physics, entitled “The Gravity Tunnel in a Non-Uniform Earth” received considerable media attention; among other venues he was interviewed on the Discovery Channel, and on radio shows in Germany or Australia.

Dr. Klotz’ research brings a much-needed expertise to the department. In addition, he also brings some teaching experience as he completed the Kaufman Teaching Certificate Program at MIT where he developed classroom lectures and taught at various undergraduate levels.

Dr. Klotz has very diverse interests and likes writing. Next to publishing scientific papers he also serves as a scientific consultant for different journalists and science fiction authors and writes on PhysicsForums.com, SoftBites.com, and for the Materials Research Society Bulletin.

Alexander R. Klotz likes cats, bicycling, reading about all and everything scientific.

THE OFFICE STAFF

The staff is the backbone of the administrative and technical work at the department. Their lives and work changed during the pandemic. Working from home, mostly using email, Teams and Zoom to communicate, they soon realized that the steps they usually took to resolve an issue required much more time because of the inability to talk directly with students, faculty and other administrative entities on campus. Their work has been essential to keep the department running, especially during the pandemic times where rules and regulations changed every few days.



Lisa Dignadice has been our administrative assistant from 2018 to the end of 2021. We enjoyed much her friendly demeanor towards anyone coming to the department office. The time working from home during the peak of the pandemic led her to reevaluate what she wanted to do. As a result she accepted a position at Enrollment Services. Thank you Lisa for your work at the department!

Sergio Mendoza soon replaced Lisa Dignadice, in January 2022. Sergio has a Bachelor degree in Organismal Biology with a minor in Geology from our college (CNSM, 2018). He is bilingual (English and Spanish). He has been hired at the college since 2013 as an intern and stream ecologist and was a lab technician before joining our department. It has been an uphill task to be trained during the pandemic and in a short time. Sergio has done very well and he has made it possible to keep the stability of the administrative work.



Korin Coombs joined the administrative staff as an administrative assistant in 2016 when Irene Howard was the administrative coordinator. As Irene retired in 2017, the search for a new administrative coordinator led us to hire Korin in that capacity. She served the department well and completed the move of the office work from “paper to digital”, a task initiated when Nicole Torres was our coordinator.

Korin also navigated the difficult COVID-19 times and helped the department keep above waters with all the administrative and purchasing tasks. This has been especially challenging since federal and state financial resources aimed at supporting the transition to teaching in alternative mode of instruction (AMI) came in waves and left little turnaround time to use. She has been on top of these tasks. Korin completed her master's in English Literature in 2020 and moved on to a Fiscal & Personnel analyst position in the Summer 2022. She was also hired as a part-time lecturer in English Composition at the English department on our campus. Thank you for all your work!



Catherine Durham who had recently retired as a long term administrative coordinator of the department of Biology has agreed to help the department in the transition time: transition back to campus, transition between department chairs and transition to a new full time department administrative coordinator. Thank you!

THE TECHNICAL STAFF



Mark McLaughlin and **Jay Conlon** have been at the department for many years and have secured the smooth operation of our many laboratory sections, serving over 3,000 undergraduate and graduate students each year.



Their knowledge and competency has been especially important as we transitioned to alternative modes of instruction. They worked with the chair and the faculty to generate the hundreds of laboratory kits made available to students to work on their lab from home. This has been no small task given the restrictive environment imposed by the pandemic!

The department is grateful to Korin, Lisa, Sergio, Catherine, Mark and Jay for all the work, the positive attitude during the pandemic and unique times of change, and for serving the department so well!

The department is also grateful to the College leadership and office. In particular to Henry Wu, Administrative Services Manager at the College, who helped the department navigate the many Human Resources and financial challenges during the pandemic.

*Thank you to
the department and college staff!*



ACADEMIC PROGRAMS

Undergraduate Program

Jiyeong Gu

In the 2019-2020 academic year we have reached 118 majors and 18 pre-majors in Physics. 37 students graduated with B.S. and B.A. degrees were welcomed as new members of our distinguished alumni group. The following years were those of COVID-19 and the enrollment stayed high: 124 BS and 74 BA and 26 pre-major students in academic year 2020-2021 and 126 BS, 76 BA, 26 pre-majors in AY 2021-2022. Twenty eight (28) bachelor's degrees were awarded in AY year 2020-2021 and 31 in AY year 2021-2022, respectively. Remarkably, these numbers stayed quite high compared to recent years (40-50 bachelor degrees per academic year) and this speaks for the perseverance, tenacity and drive of our students during the pandemic!



Due to the specific circumstance of the COVID-19 pandemic in 2020 the department could not have an in-person celebration ceremony for 2020 graduates. However, we had a virtual department graduation celebration on May 27th of 2020 and 2021 to celebrate the accomplishments of our students and to send them out to successful lives. In 2022 we could meet again for the graduation ceremony, on May 11. It was good to be able to celebrate in person, with families!

Graduate Program

Prashanth Jaikumar

Our Graduate Program, one of the top master's programs in the Nation, has had to adapt to challenges due to the pandemic even as it remains focused on providing a high-quality research-based graduate experience. We are proud of all students who persevered and graduated with their MS Physics degree! In AY 2019-2020 15 graduated and 18 joined in Fall 2020, in AY 2020-2021 17 graduated and 13 joined in Fall 2021, and in AY 2021-2022 12 graduated and 11 joined in Fall 2022. We will admit some additional students for the Spring semester. Many of the students during this time joined in the virtual format.



The Department continues its efforts at inclusion and diversity through the APS Bridge program, Google IGEN fellowships and the APS-IDEA ventures.

As Graduate Advisor, I am committed to support our students in a holistic manner and help them achieve their career goals.

I am also especially grateful to our outstanding administrative staff, Korin Coombs, Lisa Dignadice, Sergio Mendoza and others in between, whose care and concern for the well-being of our graduate students is an invaluable asset to the Department and to the graduate program in particular. To all well-wishers of the Department, I welcome your thoughts and feedback.

WORKING DURING THE PANDEMIC

Andreas Bill

New terms came to be and were discussed as we coped with teaching and continuing the research work during the pandemic: In-person, hybrid, and online formats, synchronous versus asynchronous teaching, etc. Some of these activities existed already. The department had assessed the value of online formats several years before the pandemic, and innovated as compelled by pedagogical findings. Research was affected too, especially for experimentalists who could not access their laboratories for months. We recall here how the pandemic was a major disruption of class, lower and upper division labs, graduate labs and research labs. The department's activities were strongly affected and this articles shows the extraordinary investment and creativity of faculty and staff to address the disruptions.

Alternative Modes of Instruction

One of the important expressions that our department adopted is “alternative modes of instruction” (AMI). This captures well the classes the department taught at a distance. AMI contrasts with pure “online teaching” that had become popular the past 10 years, mostly among for-profit private institutions and companies. Online teaching uses pre-recorded videos of classes with a set of self-grading homework assignments and possibly labs. The design of activities and labs that accompany the lecture are important. The only personal connection with the instructor occurs either at set online (e.g. zoom) office hours, or through email. Students can watch and work on classes at any time and they appreciate the flexibility. This format works well for self-motivated, well-prepared students. For most students, however, this may not be the best format.

Our department decided that only some lower division courses were adequate for a purely asynchronous online format. Not to replace existing courses, but rather to enhance the offerings so that students who cannot come to class in the traditional setting still could take first year physics courses. Several years ago, Galen Pickett and Thomas

Gredig, with the support of the Chancellor’s office and the University, developed such online courses for Mechanics & Heat (PHYS 151), and Electricity & Magnetism (PHYS 152), respectively. The courses are typically offered during the summer and winter breaks and in addition to in-class sections. The target audience of in-person and online classes is different so that both are well attended. The experience acquired by Drs. Pickett and Gredig and by lecturers such as Dr. Geier have played an important role for the success of our class and laboratory teaching during the pandemic.

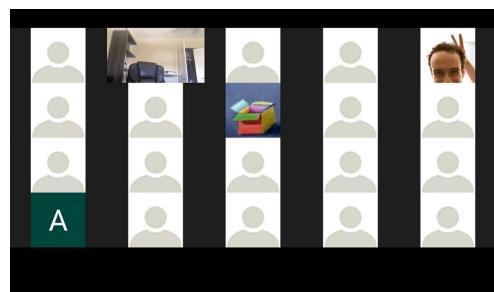


Figure: Waiting for a Zoom class to begin!

During the time of Covid-19 where we worked at a distance, the department adopted the AMI format rather than online courses described above. In the synchronous format all meet during class time in a zoom room for the class or the lab. Personal interactions between instructor and students, and between students are possible; questions can be asked and answered on time. That format worked well, especially for higher division classes, with a smaller number of more motivated and prepared students. Except for advanced physics laboratories.

WORKING DURING THE PANDEMIC

All in all, our department came to the same conclusion as many other departments at the university and in the physics community across the country: in-person teaching remains the best format for our students and the adequate learning process for human beings. This should not come as a surprise: most knowledge is recorded in books (or now online materials), in libraries accessible to everyone. Yet, with a few exceptions, people have not become competent professionals by working with these books at home, alone. Self-taught experts are rare to find in society.

There were many issues related to the teaching of AMI courses. The number of hours that our faculty and the staff devoted to make all work well in a record time has been substantial. They worked overtime in evenings, during weekends, during the summer. Some compensation was provided to faculty, especially during summer, and we are grateful for that, even though it was not entirely commensurate with the effort and work our faculty, staff, teaching assistants and graduate assistants put in during this time. The department chair is very grateful for all, because the department unanimously stepped up to the unique situation and to the tasks. This led to a successful teaching of our courses and promoted timely graduation of all students.



Figure 1a: PHSC 112 Laboratory kit

Laboratories

One of the main issues encountered during the pandemic was the teaching of our laboratory courses. How do you teach a laboratory course “at a distance”, without a lab? While something could be done for lower division labs where the required material can be fairly basic and available in a home, the task became increasingly difficult for upper division and graduate laboratories. In fact, even lower division labs had to be tailored for AMI because some pedagogically well-established activities requiring a lab could not be used. Each lab was tailored to suit teaching in AMI. Faculty members became very creative in the way they taught the labs.



Physical Science Lab:

Rod Ziolkowski together with Tom Zook, a high-school teacher, and our colleague from department of Science Education, Dr. Laura Henriques, designed lower division laboratories for the physical sciences (PHSC-112) for non-science majors. They developed a completely new laboratory manual, designed experiments to be doable at home and have fun at it. With the technical staff they tacked together hundreds of lab kits that were distributed to students first by us, then by the bookstore. They also used the web-based platform “Pivot Interactive” for the class. The team has done extraordinary work!

Figure 1b: PHSC 112 Laboratory kit

WORKING DURING THE PANDEMIC

Astronomy labs:

Similar lab kits were assembled and distributed for hundreds of students taking the Astronomy labs ASTR 100L. Our lecturer Johnae Eleby did a fantastic job at leading the effort for Astronomy.

Lower division labs:

The other lower division labs (PHYS 100A, 100B, 151, 152, 254) were also adjusted to the AMI format. For example, the PHYS 152, Electricity and Magnetism Laboratory with almost 400 students enrolled, used home experiments to train students in designing and building parallel-plate capacitors, measuring the electrical charge and number of electrons they can transfer to an aluminum ball, - building electrical circuits, and analyzing I-V curves. Students, then, shared their findings, compared and discussed via zoom with their peers and instructors. For this lab we greatly benefited from Dr. Gredig's who designed the 152 lab and teaches online classes for many years.

In other labs, students would not perform themselves the experiment but use data that were gathered by staff and faculty on the actual experiments. Videos showing staff performing the experiments were watched by students as a preliminary to perform the lab in (zoom) groups. The emphasis was then more on data analysis and understanding physical concepts.

For one laboratory (PHYS-151 Mechanics & Heat) Zoltan Papp created new computational physics modules where students would learn visual python coding and run codes to understand the physics taught in the course. We benefited from Dr. Papp's knowledge and experience since he is the person who developed computational physics at our department. The design may be used longer term beyond the pandemic because it is in line with recommendations of the American Physical Society and the American Association of Physics Teacher to teach computational physics early on in the program.

Upper division and graduate labs:

The upper division and graduate classes (electronics, PHYS 380, and the Advanced Experimental Physics Lab 450/540) posed challenges on their own. The sophisticated equipment necessary for the physics taught in these courses cannot be readily available to students at home. Chuhee Kwon and Bob Woodhouse did a great job at finding creative ways to teach these classes. The "Computer Interfacing in Experimental Physics" taught by Chuhee Kwon was the most appropriate advanced experimental lab to teach during the pandemic since much of the work is done on computers and how they connect (interface) with an experimental setup. Dr. Kwon purchased devices available on the market (myDAQ, Fig. 3) to prototype electronic and control systems and mimic output of real experiments. The devices were lent for the semester to students as lab kits assembled by faculty and staff.

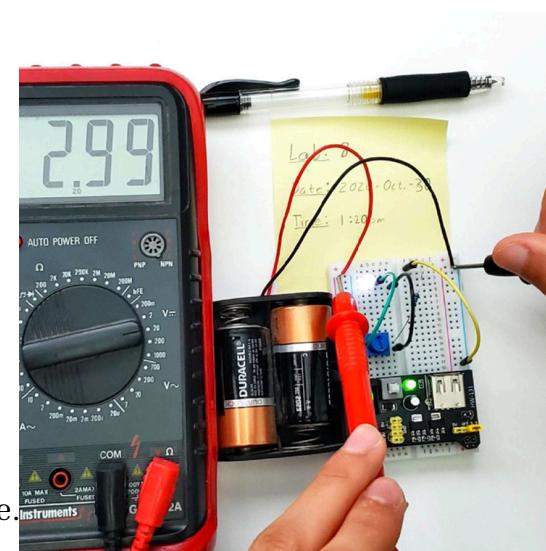


Figure 2: Student in PHYS 152 laboratory designed a voltage divider and makes a voltage measurement at home.

WORKING DURING THE PANDEMIC

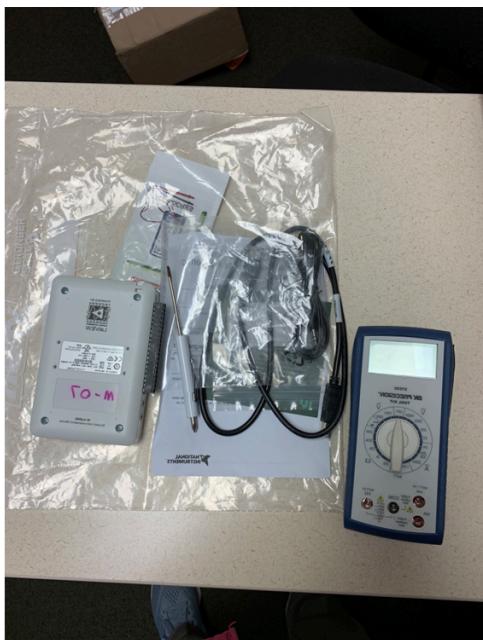


Figure 3: Part of the kit for the advanced experimental physics lab PHYS 580/480 .

Similarly, the electronics lab of Dr. Woodhouse was designed in such a way that students could work from home, on the computer and learn these more advanced topics. At the end of the semester students returned the kits so they could be used the following semester.

The short time allotted to redesign entire classes and laboratories has been a challenge for all. It has been remarkable to witness how faculty and staff came together and found creative, practical ways to provide continuity in education with teaching of the highest quality for the circumstances we all faced.

The dedication of faculty and perseverance of students in teaching and learning under challenging circumstances has been truly extraordinary!

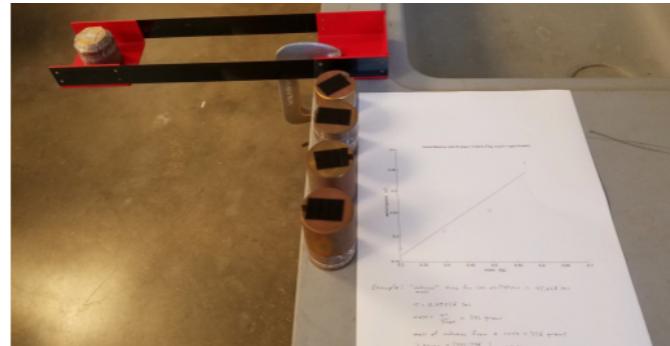


Figure 4: Inertia Balance. Finding the mass of an object without using a scale.

Research activities and research labs:

A major consequence of the pandemic has been the disruption of the research activities. Theoretical and computational physics has been less affected though working on the whiteboard or projecting a code to work on it remains a better approach.

Experimental physics groups have been affected in much stronger ways. The lack of access to laboratories for months slowed down the research. It affected the work students do in the lab for their master's or honors theses or to gain practical training and research experience. It hindered the training on equipment and also affected the maintenance of said equipment. The constant change of rules and policies, though important for the safety of all, contributed to the disruption. Experimentalists have been creative in analyzing data, do computer simulations of their experiments, organizing shifts where only one or two persons could be in a lab space.

The college office has been very helpful in organizing the activities while complying with all necessary safety measures and changes. Faculty have been very creative in their work to move forward in research and provides ways for students' timely graduation.

DISTINGUISHED LECTURER

The CSULB Physics & Astronomy Distinguished lecturer series takes place yearly since 2018 thanks to an anonymous donor who wanted the physics and astronomy community at CSULB the opportunity to hear and interact with a prominent physicist. Since then, we have invited physicists who have a record of remarkable scientific contributions and a broad view of their field of study.

The distinguished lecturer gives two talks, one for the general audience and one more specialized for the physics community.

The previous newsletter reports on the visit of two scientists in 2018 and 2019. Not surprisingly the pandemic affected this activity as well. The event was cancelled in spring 2020 and spring 2021. It resumed in Spring 2022.



Dr. Alex Szalay

Dr. Alex Szalay is the director of the Institute for Data Intensive Science at the Johns Hopkins University. Hosted by Dr. Papp, he visited us for several days to exchange ideas and knowledge with students and faculty.

Dr. Szalay is a cosmologist working on a variety of Big Data related challenges, from astronomy to medicine. Dr. Szalay published over 500 scientific publications with over 60,000 citations.

Dr. Szalay is a corresponding member of the Hungarian Academy of Sciences, and a fellow of the American Academy of Arts and Sciences.

Dr. Szalay received numerous awards, among which are the Alexander Von Humboldt Award in Physical Sciences (2004), the Microsoft Jim Gray Award in 2007. And in 2008 he became Doctor Honoris Causa of Eötvös University, Budapest.

The technical talk was entitled *Statistical Challenges in Big Data Astrophysics* and discussed the challenges faced by modern astronomy where the increasing number of surveys of the universe comes with large sets of data to analyze.

The general lecture was entitled *From Big Data to Discovery: The Fourth Paradigm* in which Dr. Szalay introduced us to the data-driven paradigm and how the scientific method is changing with the advent of big data and the necessity of statistical methods are needed to study new problems of science and society.

We are very grateful to the anonymous donor for this opportunity to learn about big data in science and the use of Artificial Intelligence (AI) for their analysis. We look forward to continue the Distinguished Lecturers Series in Physics.



PARTNERSHIP FOR RESEARCH AND EDUCATION IN MATERIALS

Michael Peterson, Jiyeong Gu, Ryan Blair

In Fall 2019 Chris Hammel, the director of The Ohio State University's NSF funded "MRSEC: Center for Emergent Materials" and professor of physics at OSU, along with Jay Gupta also from physics, reached out to our department to discuss the possibility to establish an NSF-funded partnership between CSULB departments of Physics, Chemistry and Mathematics, and OSU's MRSEC. This initiative was motivated by the long-term collaboration our departments have as two of the five Bridge Sites of the American Physical Society (see the Bridge Program in this letter). The good relationships and common interests in condensed matter physics research led to this new partnership. The NSF PREM grant, *Partnership for Research and Education in Materials*, is an interdisciplinary, multi-department and multi-university proposal that focuses on improving access to PhD programs and careers in Materials Sciences for under-represented minorities in sciences and mathematics and doing top-level research.

After an initial successful CSULB internal competition, a full proposal *PREM: Cal. State Univ. Long Beach and Ohio State University Partnership for Education and Research in Hard and Soft Materials* was developed together with members of the CSULB Physics & Astronomy, Chemistry & Biochemistry, and Mathematics & Statistics departments, and the department of Physics at OSU. A 3-year Seed grant of \$800,000 was awarded from Fall 2021 to Summer 2024 (National Science Foundation Grant No. 2122199). The PREM program is led by Michael Peterson (PI) with Jiyeong Gu (Physics) and Ryan Blair (Mathematics) as Co-PIs. The grant has allowed students and faculty to visit each other's institutions. Scientific collaborations are being established that involve undergraduate, master's and PhD students in advanced research projects. Since its award, over 20 students and over 15 faculty members from both institutions (and 4 departments) were active members of PREM.

More information can be found on the [PREM website](#)

The next step will be to submit a full proposal for the partnership in 2024.



PREM students present at the
APS Far West Meeting in Hawaii



PREM Directors
Michael Peterson and Jiyeong Gu
and (R. Blair- not on picture)



PREM student Mahfuzun Nabi presents his
research (group of Claudia Ojeda-Aristizabal)

APS BRIDGE PROGRAM - GOOGLE INC. PARTNERSHIP

Andreas Bill, Chuhee Kwon, Galen Pickett



As mentioned in the previous newsletter, Josh Mutus, Physicist from the Google Quantum Hardware Lab contacted the department because of the successes of our APS Bridge Program. We are happy to report that Google Inc and the department established a partnership that started in Fall 2019 to support underrepresented minorities to graduate and transition into PhD programs and industry jobs related to quantum matter. The partnership has been renewed each of the three years covered by this newsletter. We thank Maryanne Horton who accompanied, advised and guided us in establishing and maintaining the Google – CSULB Bridge Program partnership!

The partnership has four main components. Google provides two Bridge Fellowships. Following the model of the APS-NSF Bridge Program these fellowships provide funds for two years for each of the fellows. Google also funds four Google Summer Research Assistantships to allow graduate and undergraduate students to work with faculty on research projects for 10 weeks in the summer. The third component of the partnership is the monthly (zoom) meetings during the semester between students of our program and Google Scientist mentors who share about their life path that led them to work at Google. Finally, a Google scientist is invited each year to give a talk at our colloquium. We also plan to have a group of fellows and students visit the Google Quantum Hardware laboratory.



Over the three years of this newsletter the Bridge Program welcomed 10 students in three consecutive cohorts. Cristian Arzate (Google fellow) and Hugo Chica joined in 2019, Maya Martinez, Transito Gonzalez Baldison, Carlos Lima (Google fellows) and Nicholas Lozano joined in 2020, and Fanuel Mendes, Tomas Virgen Lopez (Google fellows), Shanel Deal and Ivan Pelayo in 2021. Of these students, May Martinez is now a PhD student at Stanford University, Cristian Arzate at the University of Oregon, Shanel Deal at OSU in Astronomy, and Fanuel Mendez at the University of Indiana. The 10 students of the three cohorts joined 17 CSULB APS Bridge student alumni. Of these alumni, 15 of them obtained their MS, and two changed career path; Nine of the 15 joined a PhD program across the nation (the latest graduates of the previous cohorts went to the Univ. of Illinois at Urbana Champaign, UC Berkeley and Florida State University).

The APS Bridge program is a founding member of the larger, interdisciplinary initiative Inclusive Graduate Education Network (IGEN). More information can be found on the CSULB APS Bridge Program (<https://www.csulb.edu/physics-astronomy/aps-bridge-program>), the APS Bridge Program (www.apsbridgeprogram.org), and the IGEN website <http://igenetwork.org>.

APS IDEA

Galen Pickett, Andreas Bill



The American Physical Society has initiated the Inclusion, Diversity, and Equity Alliance (IDEA) over the summer 2020. The Alliance consists of approximately 100 university physics departments, scientific collaborations, national laboratories, as well as a few international institutions together to discuss the actual mechanics of how to make opportunities to study physics fair and inclusive for the diverse population we have in our universities. Diversity in this sense is a trailing indicator of how fair and how inclusive we are as a discipline. Both equity and inclusivity are important values shared across many different aspects of the physics landscape here in the US, but the diversity of people earning physics degrees, starting physics research careers, and entering the professoriate is not what it could or should be. The IDEA alliance seeks to help departments identify and change elements of departmental culture that may be unintentionally undercutting our desire for fairness and inclusivity.

The CSULB IDEA group led by Galen Pickett has been involved in these conversations since the beginning of the alliance. Even though we have some impressive accomplishments in diversity (especially compared to a national standard) there are still open questions about how leadership should be shared between the stakeholders in the department (students, faculty, and staff), but also what does “fair” and “inclusion” mean specifically in our programs. That work is ongoing and is done in conversation with peer institutions (CSU East Bay, Florida International University, Texas State University, University of Central Florida).

2020 APS INNOVATION FUND

Galen Pickett



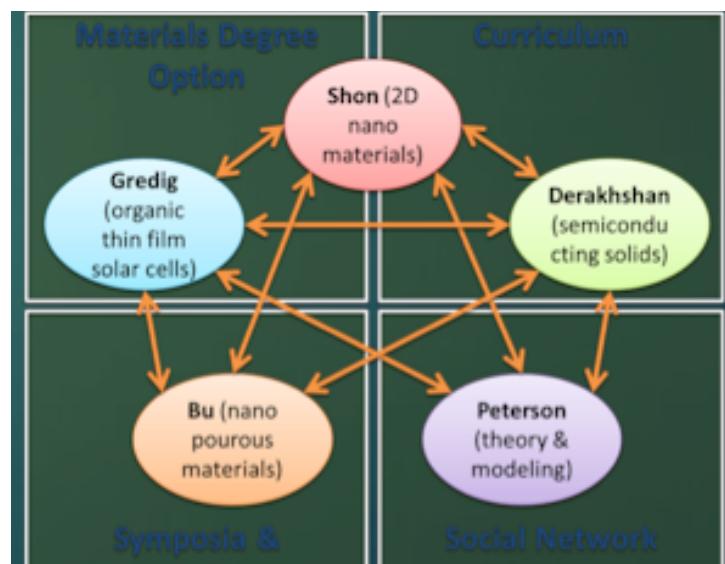
The Innovation Fund was established by the American Physical Society in 2019 as a mechanism for members to propose projects not normally fundable through ordinary channels but nonetheless support important APS values. In the Spring of 2020, my collaborators Geoff Potvin (Florida International University) and Chris Porter (then at Ohio State) proposed “Graduate Admissions in the Covid-19 Era.” The basic idea of the project was to document the “last” normal physics graduate admissions cycle (the tail end of which was disrupted by the pandemic) and to compare it to the 2021-22 admissions cycle. We interviewed first-year graduate students, last-semester undergraduates, and the campus-equivalent of what we call the Graduate Advisor across a good cross-section of the departments offering graduate physics degrees. What we found was that students and first-semester graduate courses seem to have weathered the storm of the pandemic well. In general, we found that departments that had developed resilient advising and student support structures did remarkably better than departments which took a “we hope this is over soon so everything can go back to normal” approach. In the end, there have been permanent (small for now, but who knows in the future) changes in which students seek graduate training in physics in the United States.

KECK ENERGY MATERIALS RESEARCH AND EDUCATION PROGRAM (KEMP)

Thomas Gredig, Michael Peterson



The Keck Energy Material Science and Education Program (KEMP) is an interdisciplinary program led by faculty from Departments of Physics and Chemistry including Young-Seok Shon (Chemistry), Michael Peterson and Thomas Gredig (Physics), Fangyuan Tian, Shahab Derakhshan, Hadi Tavasol and Xianhui Bu (Chemistry). The purpose of the KEMP program is to provide CSULB undergraduate students an interdisciplinary educational opportunity in materials science; an emerging field that bridges physics and chemistry and prepares students towards interdisciplinary advanced degrees. The program explicitly integrates involvement in energy-related materials research and students attend courses in Materials Science. For example, in the Fall 2021, the Materials Science course covered topics of materials for environmental applications (Tian), materials concepts for solar cells (Gredig), nanomaterials for energy applications (Shon) with a cohort of 30 students. In 2022 there were 16 students in the PHYS/CHEM 385 class and 11 taking the PHYS/CHEM 385L Laboratory. In addition, many CSULB undergraduate students work in research labs of faculty members affiliated with the KEMP program and disseminated their findings through poster presentations and at conferences.



PHYSICS TEACHER EDUCATION COALITION

Laura Henriques, Chuhee Kwon, Galen Pickett



From 2010 to 2013 the department received funding from PhysTEC to re-imagine how to engage physics students to consider a career as a high school physics teacher. The need for qualified physics teacher is great with less than half of high school physics teachers having even a minor in physics. As part of the grant we developed two courses that provide early experiences for physics majors to explore physics teaching and learning. PHYS390 and PHYS491 are co-taught by a high school Teacher In Residence (TIR) and G. Pickett and L. Henriques respectively. During 2019-20 our TIR was Heather Stirewalt, 2020-21 David Eisenberg and 2021-2022 Tamara Ayara. It brought us full circle to have Heather Stirewalt as the TIR in 2019-2020 since she was an undergraduate physics major at CSULB when we had initial PhysTEC funding 10 years ago. She's prominently featured in the recruiting posters we made back then! After getting her BS in physics she earned her physics teaching credential and then an MS in physics at CSULB.

Between 2019 and 2022 CSULB credentialed 34 physics teachers. Of those, 7 were CSULB physics majors while the others had a physics minor or graduated from other departments. Hence, more than 10 alumni of the department became high school physics teachers, making an impact on Southern California!

One of the features of our PhysTEC outreach activities are the monthly Demo Days. The second Thursday of the month brings together physics students, area physics teachers and CSULB prospective physics teachers to share demonstrations, labs and teaching tips. The semester also includes a Make & Take and Engineering Challenge. These are popular events which provide a nice networking opportunity for our local physics teaching community. During the pandemic, the TIR David Eisenberg and Laura Henriques worked out a way to have Demo Days in PHYS 491 via Zoom. Participants would video their demo and send it before the event. In this way, the High School Physics community kept in touch with our departments during the challenging times.

We also hosted the annual PhysTEC Open House in October. The featured CSULB physicist in 2019 was M. Peterson and T. Klaehn in 2021. We followed that with an activity and brunch with a physicist. It's a nice Saturday of physics with high school kids, high school teachers, CSULB physics students and faculty. It's a really nice tradition.





LEARNING ASSISTANT PROGRAM

Galen Pickett

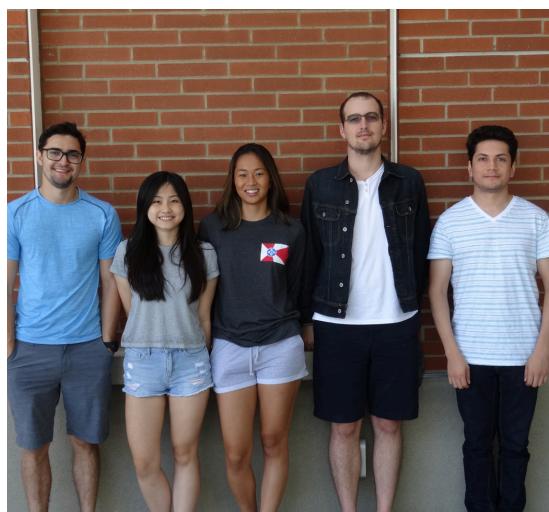
The Learning Assistant Program entered its tenth year here at CSULB during the time of this letter, with continuous support from a mixture of the American Physical Society (through the PhysTEC project) and the university (through the Highly Valued Degree Initiative). In the past years, we had 15 Learning Assistants assisting in primarily 100-level introductory courses (PHYS 151 and PHYS 152), but also in upper division courses (PHYS 310 primarily). In the Spring of 2020 we made a rapid shift to online tutoring and classroom support, and had a very active presence in both PHYS 151 and PHYS 152 in Fall 2020. The Learning Assistants have played a key role in connecting students in our Alternate Mode of Instruction (AMI, see this letter) to the faculty and to each other.

The Learning Assistants program provides a proven and powerful mechanism supporting the success of all physics students here at CSULB.



Students just beginning to study physics were brought into contact with our trained upper-division students – with predictable and positive effects on student success. Also, a significant portion of our upper-division cohort of students were Learning Assistants at one point or another – giving a powerful experience of belonging to our department and discipline.

A significant portion of our faculty have been hired since we began the LA program and our involvement in the PhysTEC movement. These colleagues will build something just as successful and meaningful as the LA program – continuing with the APS Bridge program and connecting students to the larger materials research world through PREM are two endeavors that spring to my mind. So, while the LA program just could not be continued with a single member of the original PhysTEC leadership team still on the faculty, I am extremely encouraged by what I see happening here in the department.



SOCIETY OF PHYSICS STUDENTS (SPS)

Mary Usufzy, Roman Savedra, Michelle Mckenzie

The Society of Physics Students (SPS) played an important role during the pandemic and was designated in 2021 as an *SPS Outstanding Chapter*. This recognition is received by the 15% top chapters of the society's 844 chapters!

The SPS was already very active. The enthusiasm of the SPS president during the 2019-2020 academic year, Mary Usufzy, lead to multiple fun activities that promoted the spirit of the club, such as pizza and ice cream socials, a Halloween party, a Friendsgiving potluck, and an instructional session on how to get involved in research. Other activities included a panel with alumni in industry and a session to discuss with one of our alumni, Dr. Rodriguez, at the time PhD student at UCI and today faculty in the CSU system. All these activities took place before the pandemic required studying and working from home. The chapter was recognized as a distinguished chapter that year.

The chapter met online from April 2020 to February 2022 and created an Instagram account @csulb_sps.



It was an important channel for physics interested students to keep in touch, grow personally and scientifically and get ready for their future, after the bachelor's and master's degree. During these years, the SPS benefited from an active advising by Professor Ojeda-Aristizabal.

During the pandemic time, the group met either weekly or bimonthly via zoom and later in person again. These meetings were essential for supporting each other, promoting a sense of community among those interested in physics, and were a great way to stay connected with other physics students and take a break from homework and exams!

	2019-2020	2020-2021	2021-2022
President	Mary Usufzy	Roman Savedra	Michelle Mackenzie
Vice President	Daisy Nava	Sean Johnson	Mathew Leon / Adrean Alva
Secretary	Kaitlyn Gagne	Blake Koford	Adrean Alva
1Publicist, 2Treasurer	Roshell Lamug	1Trung Tran 1Tiberius Rheaume 2Siddharth Mehta	2Maria Maalouf

SOCIETY OF PHYSICS STUDENTS (SPS)



The group organized a variety of events: Halloween Social (online) with a costume contest. Movie nights on the college's Discord Server (watching I.Q.) and then in person (for the first time again), watching "The Martian". Both movies were then discussed at length about physics, relationships and life in general.

Other events included Virtual Zoom Study Hall Sessions to help classmates interact and study together; A workshop on Research Experience for Undergraduates (REU) discussing their purpose, the application process and testimonies of students who participated in REUs the previous years (Several students joined an REU - online or in person - during the years of the newsletter); career and graduate panel to prepare for grad school and to explore academic and career opportunities. After the pandemic, the SPS resumed its in-person activities.

The SPS sees outreach to local high schools as one important goal of the club. After the pandemic they conducted in May 2022 a visit and presentation at SATO Academy of Sciences in Long Beach, where they exposed their research projects as physics undergraduate students and their projects after graduation, with the purpose of providing an example of the multiple avenues available to a physics major after graduation. Students presented also a demo that provided an example for Faraday's law, that triggered questions and curiosity from the highschoolers.

The SPS together with the department's Women in Physics (WiP) club and the AstroClub hosted a picnic event in 2022 for students and faculty to improve interactions and for the faculty to learn about the activities of the clubs. They applied together to become a NASA James Webb Space Telescope host, to celebrate the first images of the JWST. Finally, they assisted the College of Natural Sciences and Mathematics Student Council to host the 2021-2022 Nobel Laureate Speaker, Dr. Donna Strickland (2018 Physics Nobel laureate).

WOMEN IN PHYSICS (WiP)

In academic year 2020-2021 the department chair encouraged one graduate and one undergraduate student to create the Women in Physics (WiP) group at the department. Maya Martinez and Nicole Cannon enthusiastically took up the challenge and worked with their new faculty advisor, Dr. Chuhee Kwon, to make it happen.



The department has been discussing for some time that more should be done to increase the number of women who obtain their degree in physics and for some of them to move on to higher education. We are excited to see the group come to life and become a place to meet and a voice for women at the department.

That same year the newly founded group was awarded a grant from the American Physical Society Women in Physics Group of the APS Committee on the Status of Women in Physics (CSWP). The mission of the committee is to “recruit and retain women in physics at the undergraduate or graduate level. WiP groups are uniquely able to address this mission locally by encouraging and supporting the participation of women in their departments.”

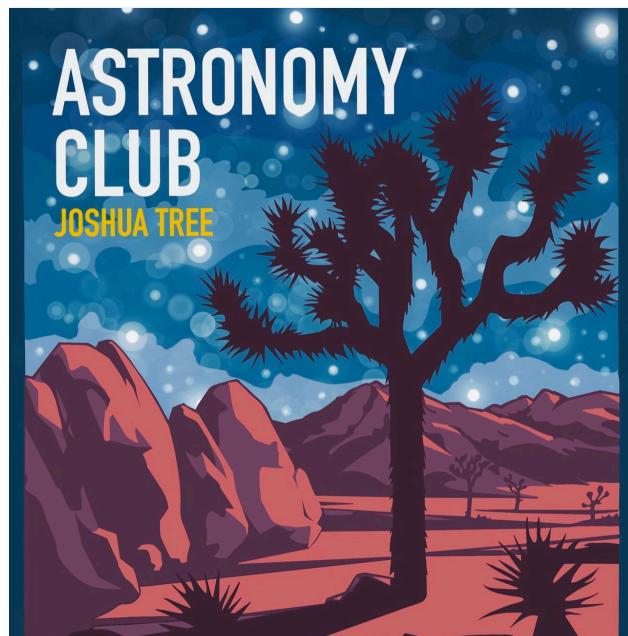


Csulbwip@gmail.com
https://www.instagram.com/wip_csulb/

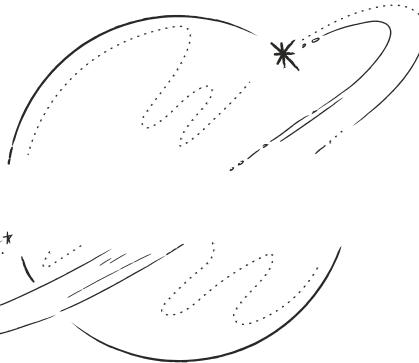
THE ASTROCLUB

Michael Mancini, Adrean Alva, Isaac Ariaga

During Fall 2019, the Astro Club participated in the Week of Welcome at the beginning of the semester, held twice-monthly meetings to discuss upcoming astronomical events and share time together, and took part in the weekly Night at the Observatory events. During that Fall, they also organized a trip to Joshua Tree National Park for stargazing using the portable telescopes of the department and met to view the meteor showers.



With the start of the pandemic the club shifted to online and opened a chat group that was always available. In this way, they kept the AstroClub community alive and met virtually during the following meteor showers and stargazing events. From Spring 2020 to Spring 2022, the two Astro Club presidents, Michael Mancini and Adrean Alva, had as primary objective to preserve and build further the community. Once back on campus they hosted movie and game nights and advertised the Rooftop Observatory events. The Astro Club always had strong ties with the Society of Physics Students (SPS) and shared the fun of many of their activities!



One major accomplishment during that time was to connect the Astro Club to NASA's JWST (James Webb Space Telescope) Celebration Collective in Fall 2021. This was a collection of astronomy clubs and organizations across the country that were sent materials to host celebrations of the launching of the JWST. The different clubs were connected by a division of NASA responsible for community outreach and taught about organizing these events and learning about the technical aspects of the telescope and launch.

Isaac Arriaga was president and Michael Mancini vice-president during the Fall 2019. Then, Michael became the president from Spring 2020 to Fall 2021, when the pandemic hit hardest, and Adrean Alva was vice-president. In Spring 2022 Adrean Alva took over the presidency of the Astro Club and Reon Allen became vice-president. During all these years, Diego Gutierrez was the faculty advisor of the Astro Club and his support contributed to keep the club alive and to provide continuity to its activities.

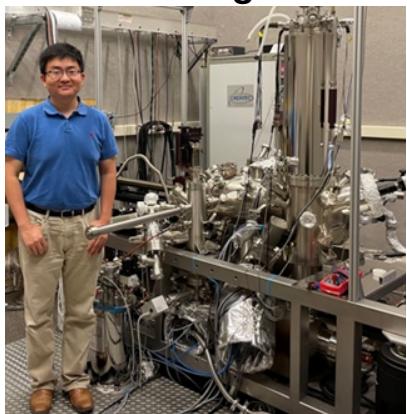


Spring 2022 opened a new era for the Astro Club. They were looking forward to organize a Joshua Tree camp trip and community outreach events with the department's new portable observatory.

WHERE ARE THEY NOW?

Dr. Haming Yuan

I was a graduate student at the department working in Dr. Gu's lab from 2010 - 2013.



What I love most about our department is that it provides students with an extremely solid foundation in both core courses at graduate level and research skills for future Ph.D. study. This is crucial for those who need a bridge between their undergraduate study and future Ph.D. work. The skills and knowledge I gained through working on thin film deposition by magnetron sputtering system in Dr. Gu's lab prepared me well in building a molecular beam epitaxy (MBE) lab and conduct research with it during my PnD.

After graduating from CSULB, I obtained my Ph.D degree in physics at University of Houston in Dr. Paul (Ching Wu) Chu's High Pressure and Low Temperature Superconductivity group, working on MBE systems. Currently I am working as an MBE engineer in Applied Optoelectronics, Inc. (in Sugar Land, TX) performing mass production growth of semiconductor lasers by MBE system. I could not have achieved these goals without the valuable experience at our department!

Brandon Kawata



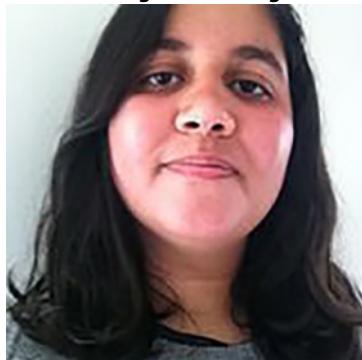
The physics experience at CSULB was amazing and I often look back on it very fondly. I made many great friends and acquaintances that were equally passionate about physics through the undergraduate and graduate programs. We would often go on coffee breaks during the day as well as go out for food and drinks in the evening after a tough week. Both the students and the faculty form a great community where everyone supports each other and makes it what it is. Discussions and support from that faculty helped me get to where I

am today and I will always be grateful for that. I learned so much in my time at CSULB advancing through the different physics courses from 1st year undergraduate physics to graduate level physics and challenging me to think in ways that I had never done before. It was a difficult but highly rewarding experience, and I am glad that I did it with the CSULB physics department.

I am currently a teacher at Animo Leadership Charter High School in Inglewood, CA teaching physics and robotics. This is my 3rd year teaching at this school and I love being able to share my knowledge of how the universe works with my students. I teach algebra-based physics, trigonometry-based honors physics, and robotics. Unfortunately, robotics was cancelled this year since we are completely virtual due to COVID but this is where we get to use coding and designing to create robots that can move, detect, and accomplish a variety of tasks ending the year with a robotics competition navigating a maze.

WHERE ARE THEY NOW?

Mary Usufzy



For my CSULB physics experience, I enjoyed doing research and serving as president of the Society of Physics (SPS) club. I worked in material sciences and researched thin film samples. I also completed the project for my university honors thesis. As SPS president, I worked with board members to schedule two meetings every month, including professional development workshops and social events. Overall, I really enjoyed my experience at the CSULB physics department.

I am currently at the CSU Fullerton master's program in physics. I'm doing research at the Gravitational Wave Physics and Astronomy Center (GWPAC). After completing a master's, I hope to continue with a Ph. D program and become a professor. Additionally, my backup plan would be to work in industry, such as the Jet Propulsion Laboratory (JPL).

Elliot Stiglic



The things I liked most about the CSULB Physics department is the general willingness to take an individual student's needs into consideration. When I first arrived at CSULB, I never thought my career goals (mechanical engineering at the time) aligned with a background in physics. I had some general career paths mapped out, but a physics degree never once crossed my mind as a realistic possibility. It was only when the CSULB physics department reached out to the College of Engineering with a double-major option that

I even realized the option was there. I dove in head-first expecting to hit an educational brick wall of failure and instead was met with open-mindedness and a strong sense of realism. Next thing I knew, I was applying for the Physics M.S. degree option Professional Physics, since the department offered a reasonable track for students who want to pursue, or are pursuing a career in industry. It was challenging but extremely rewarding.

During my time at CSULB I was able to concurrently gain industry experience in engineering positions at Raytheon and Northrop, on a variety of NASA and Air Force programs. Combining this experience with strong academic studies in physics has resulted in an extremely powerful and deep technical understanding of how things really work from a ground level. I've been able to learn new programs extremely quickly, and have had the opportunity to apply the physics background to in-depth test data analysis, design of test setups for space sensors, failure mode and effects analysis, and requirements development. A strong understanding of physics is an formidable ally to bring to the table in an engineering environment, and that's something I'm confident I never would have realized if it weren't for the CSULB physics department. I recently accepted a role in systems architecture and design at Raytheon, where I'll be supporting a few NASA R&D programs as well as a sensor for the JPSS satellite. I'm very happy and excited for where my career is going.

WHERE ARE THEY NOW?

It was an interesting time stepping into the program right in the middle of the financial crisis, but what I found was physics. I cannot give higher compliments to the faculty at Long Beach, they are not only great physicists but they are good people. I have not always had either of those, and rarely both at the same time. This experience continues to be the best few years I have spent in physics so far.

I finished off a wonderful postdoctoral experience at Institute quantique (Université de Sherbrooke, in Québec, Canada).

My next destination was the University of York in the United Kingdom where I was a Fulbright scholar. I have been successful in finding an academic position. I will start soon a position as an assistant professor and Canada research chair at the University of Victoria. I owe so much to Long Beach, and all of the physics faculty I got to learn from. I hope that Long Beach receives the support so that more of the wonderful, talented people at Long Beach are able to follow the path that I have been on if they wish to.

Prof. Thomas E. Baker



Calum Shelden



The transformative experience I had in the physics department at CSULB was characterized by a feeling of community, moral support from faculty and fellow students, and a sense of pride in doing good physics. I began my CSULB experience with a family background that treated college as relatively optional; I originally thought I was going to end up being a car mechanic or some kind of technician. After my time in the physics department at CSULB, I feel that I can achieve any goal I pursue, even my dream of becoming a world-class physicist, despite my previous lack of background in college education let alone science.

My visits of the undergraduate advisor's office to ask for general advice were especially memorable as I felt he gave me the time and space to think about and voice any questions I had, questions stemming from a curiosity that I came to realize is my most valuable tool for probing new physics and coming up with new, creative research ideas.

After finishing my undergraduate career at CSULB in the spring of 2019, I began my PhD at the University of California, Davis (UCD). I am now conducting research investigating the Casimir Effect using both experimental and computational techniques under the supervision of Prof. Jeremy Munday in the Electrical and Computer Engineering Department (ECE).

Once I successfully obtain my PhD in electrical engineering with a minor in materials science, I wish to secure a postdoctoral position and transition to a faculty position in electrical engineering or applied physics where I will mentor the next generations of scientists and engineers and continue advancing our scientific knowledge through cutting-edge research.

WHERE ARE THEY NOW?

Luciano Alvarado



What I liked best was the collegial feel of the Physics department, everyone was always friendly and helpful from undergraduates, graduates, faculty and staff, and especially Lisa and Korin. I also appreciated that there were professors who were enthusiastic about their students and pedagogy. The emphasis placed on diversity in STEM and supporting students who may not wish to pursue a physics research career was encouraging. I felt as if I was a part of something special because I don't think that many physics departments have a diverse makeup, and I feel honored to have learned with and from so many unique and intelligent individuals.

I am currently in the UCI Law JD program with an expected graduation date of 2023. While I plan on entering legal practice, I do still intend to leverage my physics degree in order to sit for the patent bar. Ultimately, I would like to end up in the private sector (in-house counsel, Big Law firm, or a boutique firm) as an intellectual property lawyer. Overall, I am appreciative of all the opportunities that the CSULB Physics department has afforded me.

At CSULB, I enjoyed walking into the department every day and saying good morning to Lisa and Korin. They helped start and make my day first thing in the morning! I loved the energy on campus; seeing all the students on their way to their classes, ready to make something of themselves. I liked seeing my fellow graduate students and the good times we shared in the "cube," struggling through physics problems, but also the fun and interesting conversations we shared. Being a TA was also a great experience for me; I was able to hone in on my teaching skills, learn how to work with students, and practice delivering the message of physics to all.

My experience at CSULB and my master's thesis leaning towards physics education research showed me how much I could learn from others and that I had caring professors who were willing to help me along my path to success.

I am currently working as an adjunct physics professor at Cypress College (Cypress, CA) and I hope to have a successful career as a community college faculty. Currently, I am teaching one lecture on conceptual physics and teaching two conceptual physics laboratories online (Zoom University!). My goal and dream for the future would be to obtain a full-time physics faculty position at a community college where I can give back to the students the education that was so freely given to me.

Aaron Schwartz



WHERE ARE THEY NOW?

Denzel Philip Belleza

I love that Physics & Astronomy at CSULB allowed for students to become involved with communities, events, and opportunities such as Society of Physics Students (SPS), PhysTEC demo days, graduate assistant positions, learning assistant positions, or research opportunities. Moreover, professors and faculty and staff (Korin & Lisa) were always willing to help students out with academia and extracurricular activities. CSULB Physics & Astronomy provides a supportive & collaborative environment where students can grow and work toward their goals.



I currently work at Raytheon Intelligence & Space as a Hardware Quality Engineer II where I work hands on with projects for space systems and airborne systems. I am also back at CSULB (Go Beach!) pursuing my Master of Science degree in Aerospace Engineering. Graduating with a B.A. in Physics and B.S. Mechanical Engineering helped me find a career with my dream company. But one day, after I receive my M.S. in Aerospace Engineering degree, I wish to take up a position as a lecturer so that I can inspire the next generation of great minds in STEM, just like the awesome faculty in the Physics & Astronomy program inspired me.

Nicholas Jimenez



My time at CSULB is something that I will always deeply treasure. I met some incredible people as my new friends, and at times I miss those long nights working with them to solve some complex problems or just talking about life. I am grateful for the time that I was able to collaborate on establishing the frameworks for a MOKE microscope in Dr. Gu's lab. I personally enjoyed my opportunity to work as TA teaching Physics lab courses to some really great students.

After completing my Master of Science in Applied Physics, I moved to Albuquerque, New Mexico and am currently working as a microelectronics technologist at Sandia National Laboratories. My work focuses on the Dry/Wet Etching of the semiconductor wafers. I am looking to become more involved in fabrication process in becoming an R&D engineer, but I am excited to see where my career leads me in these next couple of years.

RETIREMENTS



Dr. Montserrat Geier

Montserrat Geier came to CSU Long Beach as a lecturer in 2005. She retired as an emeritus faculty in Spring 2021 and has served as a volunteer since, providing office hours for lower division classes that she taught so successfully for many years.

Montserrat was born in Barcelona, Spain. At the age of six, her father, a textile engineer, moved the family to Brazil.

Here is what she says about her path:

As a young child growing up, I always loved science. I vividly remember in 1969 watching the television and seeing Neil Armstrong touch the moon's surface. That point in time sparked my interest in science even more, and as I began to dream of space exploration, I knew I wanted to become a Physicist.

I received my Ph.D. in Physics from Ruprecht-Karls University in Heidelberg, Germany in 1989. My theoretical work, under the supervision of Heinz Horner, was in theoretical Condensed Matter Physics, Spin Glasses. In 1990, I was admitted as a Post-doctor at the State University of Sao Paulo (USP). From 1991 to 1999, I worked as a tenured professor at the Federal University of Goias, in Goiania, Brazil. As part of my work, I was coordinator of the Master's program in Physics.

In 1997, I received a scholarship from the Brazilian government to come to UC Irvine as a visiting researcher. I worked with Alexei Maradudin, Wolfgang Zireau, and Tamara Leskova, on thin films. During this time, I met my husband, Jim, and one year later, we got married and I decided to move to California.

From 1999 to 2001, I was a Lecturer at UC Irvine where I experienced great satisfaction in teaching a diverse population of undergraduate students. In 2001, I began working at CSU Fullerton, and finally arrived at CSU Long Beach, which has been my academic home ever since.

I love teaching, and I have always strived to incorporate emerging pedagogies to help students achieve a deeper understanding of physics. For the past twenty years, my passion and focus has been teaching large introductory physics courses.

Upon my retirement in May 2021, my husband and I decided to relocate to the garden island of Kauai to enjoy the beauty and peace that the island offers.

RETIREMENTS



Dr. Paul Hintzen

Dear Professor,
I am not in your class and glad I sat in today because I plan to take it next semester! It was interesting to learn about the expansion of the universe. IT IS amazing how things work. For a lecture class, thanks for making this class Comedy! Anywho, have a lovely day!
Take it easy,

Introducing students to scientific thinking by applying physics and mathematics to astronomy has been rewarding and a source of great joy. Virtually all of our students are awestruck by observations of the Sun, planets, stars, galaxies, and the scale of the Cosmos, as described in the note from a student and the picture from one of our rooftop observing sessions.

While I served as Faculty In Residence at Parkside College, interactions between the Department and students, especially freshmen, were particularly productive. If the weather cleared, or a weekend event suddenly became available, I could not only send email alerts, but also post notices on the Residence Hall Dining facilities, hours before the event.

One Saturday morning at 2am, approximately 160 students and staff joined me on the HSCI roof to observe the 5 naked-eye planets stretched from the Eastern horizon to the zenith. After several wonderful hours of observing and discussing the planets, I began to dismount the telescopes as the horizon glowed. I noticed one to two dozen students sitting on the roof facing East. When I inquired, they said they had ordered takeout breakfasts so that they could watch the sunrise from the top of HSCI.

Of the approximately 10,000 students in my classes over the years, many completed the semester understanding the difference between opinion and scientific evidence, an important matter to every person in our democracy. A number of students subsequently decided to undertake majors in the sciences, and several became MDs and MD/PhDs.

Now that I have retired, I am spending as much time as possible visiting my family and enjoying catch-and-release flyfishing for native trout and char in National Parks and Wilderness Areas. While admiring native trout is the focus of these trips, they are mostly an excuse to see the most beautiful lands in the Americas.

IN MEMORIAM

Irene Howard always said that Drs. Simon George and Keung Luke shared their office. Indeed, as I (Andreas Bill) started my tenure at the department I had the office next to theirs in Peterson Hall 3. They shared office for almost their entire career, and even after retiring. They were warm and welcoming and it was an excellent start to have them as neighbors at the department and have them share their time and wisdom with me. I miss both.



Dr. Keung Luke (left) and Dr. Simon George (right)



Dr. Keung Luke

Mar 2, 1935 - July 31, 2021



Keung was born on March 3, 1933 in Canton, China. He was the youngest of five children, and survived the Japanese occupation and diphtheria. He came to the USA as a teenager. His dad had moved a few years prior to the east coast. Keung remembers spending many hours working in a restaurant as a teenage boy. But his high school counselor encouraged and helped Keung apply to Brown University (in his hometown) and MIT. Both universities admitted him and he decided for MIT that offered a higher scholarship.

Keung obtained his B.S., M.S. and Ph.D. degrees at MIT in Electrical Engineering and Nuclear engineering. He graduated with a PhD in 1964. His first appointment was at NASA-Lewis in Cleveland, Ohio, where he worked on thermionics. After some turn of events he moved to Pasadena, California to take a job at Unified Associates. There he attended First Chinese Baptist Church of Los Angeles.

Through another attendee who worked at Douglas Aircraft, Keung was introduced to Dr. Charlie Roberts who at the time was a consultant at Douglas Aircraft. He was also chair of our department. Keung was offered a position as an assistant professor by Dr. Roberts and that is how he started his long career as a teacher-scholar. Only one year after joining the faculty, Keung shared an office with Dr. Simon George (see this Newsletter). Both taught wearing a suit and tie.

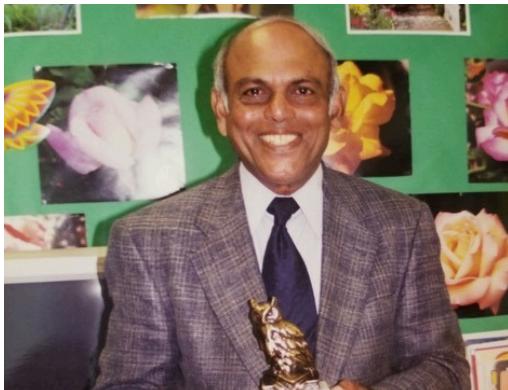
Keung Luke took part in pioneering work in physics research and teaching. For example, he spent summers working on solar cells at Jet Propulsion Laboratory (JPL) and published well cited papers on the topic. He also created what is now known as the advanced experimental course (lecture and laboratory) on “Computer Interfacing in Experimental Physics” PHYS 580/480. He received the Outstanding Professor Award for his work in 1993.

Keung was a strong Christian believer. He was active at First Chinese Baptist Church where he was in charge, among other activities, of organizing and teaching Sunday school for up to 1000 children. His love of the neighbor also motivated him to take care of students on campus; in particular, the “Hong Kong Alumni” that to this day meet regularly. Keung also followed another passion: photography – many of our more recent pictures at department parties were taken by him.

Dr. Keung Luke fully retired from CSULB in 2003. Since then, he kept in touch with the department. As illness took a toll on him, many friends, including Irene Howard, our department coordinator of 39 years, visited and helped him. Keung decided to support the work of students and faculty at the department and endowed no less than four scholarships at the Department and the college of natural sciences and mathematics. Keung will be remembered as a kind, warmhearted and generous person.

Dr. Simon George

May 10, 1931 - Jan 5, 2021



Simon was born in the state of Kerala, India. He received his B.S. from University of Travancore (Kerala) and M.S. from the University of Saugar followed by a teaching appointment at the University of Guwahati, Assam, India.

He arrived in the U. S. on a Fulbright Fellowship in 1957, later obtaining his Ph.D degree in Physics from the University of British Columbia in 1962.

Starting his professional career in the U.S., he was promoted through the ranks to tenured full professor at our department, where he taught until his retirement after 37 years. During that time, he met his wife of over 55 years, Barbara, who was herself a well-known faculty member in Legal Studies, College of Business, at CSU Long Beach.

Simon was rewarded for his efforts as the recipient of three of the University's most coveted awards -- Outstanding Professor Award (1984), Scholarly and Creative Activity Award (1985), and one that was particularly meaningful to him, the Academic Leadership Award (1997) which was given for his tireless work in faculty governance, at the Senate and as an active participant of the California Faculty Association and the Association of Physics Teachers.

During his career he was awarded several National Science Foundation Grants for travel to England, India, Mexico, and Venezuela. He authored/co-authored more than 50 papers in scientific journals and presented an equal number of papers at scientific conferences all over the world. A number of CSULB students completed their research work under his supervision for a master's degree in physics and he served as external examiner for several Ph.D. theses for universities in India. After retiring from teaching at CSULB in 2004, Simon continued to dress in his usual suit and tie to go to his office on campus every day, sharing an office with his officemate and friend of more than 30 years, Dr. Keung Luke (see this Newsletter).

Simon was active outside university walls as well. He served as a member of the Parks and Recreation Commission for the City of Long Beach, traveled extensively throughout Europe, South America, and Asia, and enthusiastically lead tour groups of 10-20 people on 3-week tours to India, Nepal and Sri Lanka.

Dr. Simon George will be remembered as a lifelong tennis player, excited about the world of politics, a champion of shared governance, and devoted to his students. He was an "exceptionally good natured and always a gentleman" who offered constant encouragement to all to achieve academic and professional success.

COMMENCEMENT

The department had an impressive growth in the past eight years. In 2010 we had 50 undergraduates and 35 graduate students in the department. This academic year we had 151 undergraduates and 59 graduate students. The most impressive part though, is the graduation rate that places us number one among the CSUs and among the top Universities with a terminal MS degree in the nation (see this Newsletter). This year again, we had one of the largest graduating class ever for the department: 44 students completed their BS (over half) and BA, and 19 graduate students obtained their MS degree, all but one with a thesis.

Congratulations to all students who obtained their degree and best wishes of success for their future. Once in the CSULB Physics & Astronomy family, forever part of it! Keep in touch through LinkedIn CSULB Physics Group and twitter @CSULBPhysics and soon Instagram!

This year we had a few students who were honored for their achievements. Here are their names and the award they obtained.

College of Natural Sciences and Mathematics Awards

Graduate Dean's List - **Anh Nguyen**

Richard D. Green Dean's Award - **Andrea Nelson**

Outstanding Thesis Award - **Raphael Monroy**

Departmental Undergraduate Honors

Calum Shelden

Lizbeth Galvez

Kyle Mosier

Departmental Graduate Honors

Josue Rodriguez

Taylor Shannon

Renyu Wang

Specialty & Department Awards

AAPT Outstanding Teaching Assistant Award

Nina Miller

Dept. Outstanding Learning Assistant Award

Denzel Belleza

Dept. Outstanding Teaching Assistant Award

Johnae Eleby



Richard & Florence Scalettar Scholarship

Rami Allaf, Joseph Solis (2019-20),
Natalie Cannon, Stuart Slavin ,
Maria Maalouf, Carlos Lima

John & Terry Milligan Scholarship in Physics

Norberto Gallego (2019-20), Olivia Kridler, Blake Koford

John E. Fredrickson Endowed Scholarship

Stuart Slavin (2019-20), Spencer Hall, Amir Omidwar

Keung Luke, Charles Roberts and Richard Whiteley Endowed Scholarship

Chris Burgess (2019-20), Zachary Minaker, Alejandro Zafra

Irene Howard and Keung Luke Endowed Scholarship

Sylvia Chow (2019-20), Amir Omidwar, Seann Smallwood

Kevin Kwok Chan, HK Alumni and Keung Luke Endowed Scholarship

Everardo Molina (2019-20), Christopher Garnier, Vinh Tran

Olaf & Mary Jane Anfinson Endowed Scholarship

Nicole Campbell, Hugo Chica, Norberto Gallegos, Spencer Halls,
Christopher Stackhouse,

Angelic Brulc, Kyle Covington, Tommie Day, Transito Bryan Gonzalez, Dietrich
Henson, Michelle McKenzie, Changyoo (Luke) Park, Jacob Weber

Scholarship fund of the Department of Physics & Astronomy

Leonel Rodriguez, Sara Qubbaj (2019-20)

Google Bridge Fellowships

Maya Martinez, Transito Bryan Gonzalez,
Fanuel Mendez, Tomas Virgen Lopez

Richard D. Green Graduate Research Fellowship

Patrick Barfield, Laura Tandy

Academic Year 2019 - 2020

Isaac Arriaga, Mohammad Ashas, Megan Barry, Chloe Goings, Emran Karzai, Michael Mancini, Evan Phelan, Nicholas Werner

Academic Year 2020 - 2021

Cristien Arzate, Paul Fischer, Dave Holling, Lydia Juan, Everardo Molina, Ryan Towne

Academic Year 2021 - 2022

Patrick Barfield, Sierra Breyer, Felipe Kosareff, Nicholas Lozano, Kamyar Mojtabedzadeh, Laura Tandy, Vinh Tran

New scholarships and assistantships

(during the time of the newsletter)

Dr. Keung Luke (see this letter) endowed two scholarships that are intended for all students of the College of Natural Sciences and Mathematics in 2021. These will be awarded starting the academic year 2023-2024.



Endowed scholarships now awarded yearly (starting in 2019 or 2020)



The Olaf and Mary Jane Anfinson Endowed Scholarsh
Three Keung Luke Endowed Scholarships
The John E. Fredrickson Endowed Scholarship,
The Gisella and Wilfried Eckhardt Endowed Scholarship



Partnership with Google Inc. (since 2020)



To provide for the two Bridge Program fellows of the American Physical Society,
to provided funds for four Summer Research Assistantships.

The presentation of the donors of the scholarships and assistantships and of the persons named after them can be found on [the Beach Scholarships website](#).

The Department has greatly benefited from the generosity of many, especially retired faculty and alumni. We are grateful to all who contributed to supporting our students all these years!

THANK YOU!



GIVING

“We make a living by what we get, but we make a life by what we give”
- Winston Churchill

The Department relies solely on private contributions to fund essential student enrichment activities. These include:

Faculty-mentored Research Experiences
Weekly Colloquia featuring Visiting Scientists
Training on state-of-the-art Instrumentation
Rooftop Astronomy Nights & Outreach
Mobile Planetarium Trips & Maintenance
Scholarships and Assistantships
Student Clubs (SPS, Women in Physics, Astronomy Club)



Your generous contributions directly impact the quality of the educational experience we can offer our students. They play a crucial role in ensuring that diligent students receive the necessary financial support to stay on course and graduate with minimal or no debt.

Give online at: <https://giveto.csulb.edu/>



Maryanne Horton, Senior Director of Development for the College, retired in June 2023. Maryanne's support of Physics programs and relationships with our faculty and alumni were greatly valued. Thank you, Maryanne!

To establish a named scholarship, assistantship, create an endowment, or include the Department in your Will or Trust, please call or email our new director of development:

Christina Hall, Director of Development
562-985-1780
Christina.Hall@csulb.edu

We offer heartfelt thanks to our generous donors, named and anonymous, for your invaluable support. Your contributions towards enhancing educational experiences for our students is truly making a lasting impact.

Thank you for championing the causes of Physics at CSULB, and acting as catalysts for change in our students' lives.



2019-2022 Newsletter

California State University, Long Beach

Department of Physics and Astronomy

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