

SPS Chapter Report 2018-2019

University of California, Berkeley (Zone 18)
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Part I: National and Regional SPS

“Alone we can do so little; together we can do so much.”

—Helen Keller

Representing a number of National SPS members and having hosted the Zone 18 meeting in 2015, Berkeley SPS has an extensive history of **service** to the **national organization**. This year, Berkeley SPS has made strides in inter-chapter relations by sending ambassadors to the **Zone 18 meeting** and welcoming students from the **Johns Hopkins University chapter**.

Hayward Meeting (2 February 2019)

Berkeley SPS sent 14 representatives to the **Zone 18 SPS meeting** held by **CSU East Bay** in **Hayward, CA**. Participants attended a number of talks and workshops facilitated by the local chapter, after which attendees from numerous **Northern Californian chapters** mingled and shared their experiences as physics students who might not otherwise have met save for the meeting. Attendance at the meeting opens the door for **new avenues** of **inter-chapter collaboration** and **further participation** with the **national organization**, with Presidents Emily Glazer and Mayia Vranas discussing potential **future cooperation** with CSU East Bay SPS chapter President Dennis Calderon.



A group of students from Berkeley SPS scaling a hill in Hayward, CA, the location of the 2019 SPS Zone 18 meeting. Next stop: Mount Everest!



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Presidents Mayia (fourth from left) and Emily (fifth from left) pose with members of Cal State East Bay's SPS members at the 2019 SPS Zone 18 meeting. The gesture represents SPS's ability to bring together students across schools together in camaraderie.



At the 2019 SPS Zone 18 meeting, students from schools across the Bay mingle over brunch and a series of amusing presentations. The life-long connections established at the gathering were well-worth the early morning drive to Hayward.



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Andrew (left) participates in a demonstration on torque while Wendy (right) giggles in the background. The demo was simultaneously an homage to the laws of physics and a test of strength, proving that all those hours in the classroom and at the weight room paid off.



A group photo of Berkeley SPS ambassadors to the Hayward Zone 18 SPS meeting in the Spring semester. This meeting gave students a bigger picture view of their contributions to SPS and their communities.

A Visit from Johns Hopkins (20 March 2019)

In the Spring semester, Berkeley SPS received visiting students from the **Johns Hopkins University** (JHU) SPS chapter. Berkeley SPS facilitated a guided tour of the local astronomy building, **Campbell Hall**, following a discussion with **Professor Eugene**



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Chiang of the Department of Astronomy. Visiting students were also invited to a general meeting, after which a group of JHU and Berkeley SPS students hiked to the **Big C**, a local monument, and had a group dinner at the local restaurant **La Vals**. Students from the two chapters bonded over shared experiences of physics students, and the move inspires future collaborations with other SPS chapters.



Students from the JHU and Berkeley SPS chapters pose together atop the Big C following a short upward hike. Though strangers at the beginning, students from the two schools were like old friends by the summit.



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Part II: Local Campus Engagement

"I cannot even imagine where I would be today were it not for that handful of friends who have given me a heart full of joy. Let's face it, friends make life a lot more fun."

—Charles R. Swindoll

As a **support structure** for physics students and **representative of undergraduate interests** to the **Department of Physics** at the **University of California, Berkeley**, our local **Society of Physics Students** chapter has a substantial presence in physics student life. While shaping the **culture** of the department and promoting **equity of inclusion**, Berkeley SPS allow works to prepare students to take their next steps in their physics careers.

General Meeting

Every week, Berkeley physics majors across the department congregate in a corner of the **Physics Undergraduate Reading Room & Collaboration Center**, LeConte Hall, for some professional, social, or academic activity. **Weekly SPS meetings** allow students to take a brief reprieve from studying in order to lounge around with friends and bolster their physics careers. We outline below a number of particularly engaging weekly meetings held in the 2018-2019 school year.



(clockwise from bottom left) Rahul, Kobe, Ben, Kate, Emily, Patrick, Nathan, Carter, and Nicholas enjoy a post-meeting dinner at Mandarin House south of campus. SPS members take a break from quantizing gravity to relax with plates of possibly authentic Chinese cuisine.



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Inaugural Meeting (7 September 2018)

Berkeley SPS kicked off the 2019-2020 school year with its traditional **inaugural meeting** held in 375 LeConte Hall. As students filed into cinematically arranged chairs, snacks in hand, the **incoming officer board** introduced themselves one-by-one and made the first announcements of the school year. Afterwards, students new and old made casual conversation, and the lifeblood of the club began anew, foreshadowing an **exciting year to come**.

Physics Meet and Greet (12 September 2018)

At the second general meeting of the school year, attendees would **pair up** in a musical chairs-esque activity to discuss a myriad of **miscellaneous questions** about **hobbies** as well as future **aspirations**. In doing so, students were able to talk to people they may otherwise not have talked to, and new students were immediately able to make friends with other students in the department.

Mentorship Scavenger Hunt (19 September 2018)

At one general meeting at the advent of the school year, Berkeley SPS paired up underclassmen with upperclassmen in a **mentorship program**. As an icebreaking activity, students were led on a **wild scavenger hunt** around LeConte Hall and environs, using clues to find a plethora of **well-known department landmarks**. Berkeley SPS's mentorship program connected new students to weathered undergraduate veterans, passing down helpful knowledge for surviving and thriving in the department.

Origami with SPS (17 October 2018)

For one general meeting, Berkeley SPS provided reams of **origami paper** and students gathered for a relaxing **de-stress meeting** in the middle of midterm season. Students eased their exam anxieties by folding **cranes**, **roses**, and **dragons** while sharing laughs over casual conversation. The meeting stands out as one example of the Berkeley chapter's dedication to **mental wellbeing** in a high-stress academic environment.



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Yilun poses grinning with a piece of unsullied origami paper, realizing that reality can be whatever he wants. With the great responsibility of creation in his hands, Yilun contemplates how to best achieve his dream of becoming the next Michelangelo or, perhaps, da Vinci.



Students at the SPS origami meeting show each other their fabulous paper creations. Using tiny slips of paper, these ingenious students were able to bring to life a fantasy world all their own.

Physics Jeopardy (24 October 2018)

For the first time, the chapter hosted a **Physics Jeopardy** general meeting, in which a "Jeopardy" format was used in order to test colloquial physics knowledge for teams of undergraduates. Much amusement was had at the attempts at correct answers (or lack



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thereof). This team-building exercise was the first of its kind in the chapter, and we hope to continue these exercises next year and into the future.



Physics jeopardy contestants strategically contemplate what question category to answer next. The move represents many students' grand debuts on reality television.

Halloween Party (31 October 2018)

In a festive, spooky celebration, Berkeley SPS held an outdoor **Halloween pizza party** celebration where students took refuge from unfortunately timed midterms to have a banter with friends while feasting on the Physics Department's snack of choice. Though on Halloween, the celebration was anything but scary.

Movie Night (14 November 2018)

On one November evening in the midst of midterms, students gathered together in a lecture hall and enjoyed a **theatric masterpiece of cinema**. Students were granted brief reprieve to **enjoy comic relief, hang out with friends, and munch on theater snacks** in the comfort of the lecture seats of LeConte. Students were so giddy that they were almost distracted from the fact that they were watching *One Punch Man*.

Secret Schrödinger (5 December 2018)

Similar to previous years, we hosted our annual **Secret Schrödinger** event, a Secret Santa style **gift exchange** with an added physics twist. Held in December in the midst of the holiday season and exam preparations, students get together to share **warm snacks** and



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drinks, **exchange gifts**, and make **deeper friendships**. This event has become a tradition that many undergraduates (in physics and related departments) look forward to, and even with the growing number of participants, we make sure that everyone has a gift to give and receive.



(from left to right) Nicholas and Emily posing while buying snacks for the Winter Holidays general meeting. Meeting-goers enjoyed a particularly festive palate of snacks in addition to the company of an excellent collection of merry folk.



(from left to right) Emily and Mayia posing in front of the Secret Schrödinger Christmas trees "Dennis" and "Denise," who cast loving shadows on secret gifts left by students with true Christmas cheer. Though Christmas is seasonal, cheer is year-round!



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In the spirit of Secret Schrödinger, physics students populate the space under the SPS Christmas trees with thoughtful presents of all shapes and sizes.



SPS members at the Winter Holidays meeting show each other their recently acquired presents and share laughs and holiday cheer. The meeting takes place during the week before finals, a valve to release pent-up anxiety in a wholesome, merry gathering.

Valentine's Day Party (13 February 2019)

To celebrate the holiday of love, Berkeley SPS brought out the big guns, heading to Safeway and retrieving a large quantity of **cookie icing supplies**. The event was combined with a **card writing session** and **arts and crafts**. While sharing in each other's company,



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attending students enjoyed eating their **artfully decorated cookies** and delivering their **heartfelt cards**. Students even wrote a card to Department Advisor Amanda Dillon, which was belatedly delivered months afterwards.

SWPS 101 (13 March 2019)

For the first time, our SPS chapter collaborated with Berkeley's **Society of Women in Physical Sciences (SWPS)** to bring their popular and educational presentation to our population. Entitled "**SWPS 101**", the presentation is intended to educate listeners on issues pertaining to **women** and **minorities** in the physical sciences, emphasizing why it is important to make an active effort to integrate women into the community. The collaboration was in part in response to feedback that many of our SPS members had not been able to or did not attend the presentation at the start of the year hosted by SWPS. With the hopes of reaching a broader audience, particularly members who might not be inclined to attend SWPS meetings, we invited SWPS coordinator and physics grad student **Sylvia Lewin** to give the presentation at a general meeting. The presentation was well-attended and positively received, and listeners actively engaged in the conversation.

Staying Healthy with SPS (17 April 2019)

At the general meeting on 17 April 2019, SPS had students **Miyuko Niwa** and **Jessie Lan** from the Department of Nutritional Science and Toxicology to come and give a **talk** on the makeup of **balanced meal** and how to make them given the busy life of a typical college student. The talk has slide shows and was interactive, well-planned, informative, and relevant. The speakers also brought hummus and carrots as well as ingredients for the participants to make fruit parfaits, demonstrating that it was not difficult to eat **healthy on a budget** and under prohibitive time constraints. In the end, the speakers also handed out simple recipes as parting gifts. Overall, it was a very great educational talk combined with hands-on learning. Meetings like these which give practical, everyday



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advice to college students are key in promoting a healthy style to students under duress of such a difficult major program.



SPS members pose with Miyuko and Jessie (second and third from left, respectively), who gave a riveting (and very needed) talk regarding the importance of fruits and vegetables in a balanced diet. As textbook examples of self-sacrifice, physics majors benefit from a little nudge to stay healthy.

Thank You Letter Writing (24 April 2019)

Equipped with twenty stamps, a ream of envelopes, and a stack of A4 paper, attending physics majors were invited to write **thank you letters** to mentoring figures who were influential in their development as physicists. Webmaster Andrew Hsu was beaming as his letter to an old high school physics teacher was delivered to the post. In the midst of tense exams and lengthy problem sets, it pays to remember where our roots lie.

The SPS Room and the Snack Shack

Berkeley's SPS chapter finds its home in 184 LeConte, known by local students as the **SPS Room**. The SPS Room is an undergraduate space in the department where students can work, socialize, and answer the **Fill-in-the-Blank of the Week** hastily scrawled on the whiteboard. In addition to hosting weekly **SPS Officer meetings**, the room is our chapter's official base of operations in **LeConte Hall**, the physics building at UC Berkeley.

The SPS Room is home to the famed **Snack Shack**, where students can peruse a wide and ever-increasing variety of snacks including chicken bakes, macaroni and cheese, instant noodles, chicken bakes, ice cream, apple ciders, chicken flavored bakes, and bakes with



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chicken in them. The importance of the Snack Shack in maintaining students' dietary requirements has solidified its reputation as a department savior, even spawning an endearing Snack Shack food review Instagram account, [@berkeleyspsfoodreview](#).



(from left to right) Rahul, Erika, Nicholas, Jyo, Ivan, Nicholas, and Alex, a who's who of SPS members engaged in intense, in-semester focus in the comfort of the SPS Room. On the right wall, the Snack Shack rack looms over the students, a formidable presence in the shared space.

Socials

In Berkeley's Department of Physics, SPS serves as a **welcoming organization** for undergraduates which frequently organizes **socials**, acknowledging the importance of a **community** and **mental health** in an academically rigorous environment. SPS socials give physics students at Berkeley time to unwind and kick up their heels as they reflect on the fantastic group of people alongside whom they study. In this section, we summarize SPS's social events in this past 2018-2019 academic year.

Bowling Night (28 September 2018)

At the turn of autumn on a comfortable, breezy evening, students from Berkeley SPS drove northward to **Albany Bowl**, a local bowling alley in the Bay. While munching on pizzas and other snacks, students took turns **landing strikes, accepting spares, and throwing gutterballs** while feigning embarrassment. A fantastically planned reprieve from schoolwork, the bowling social was a subject of laughs all the way through the car rides home.



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(from left to right) Siddhant and Brian, professional ball rollers, prepare to bowl perfect strikes at the SPS Bowling social. In the background, Carter observes with fervent anticipation.



(from left to right) Siddhant and Erika "Sharpshooter" Hathaway simultaneously throw award-winning bowls down the bowling lane, demonstrating physics students' incredible bowling prowess despite lack of bowling lingo knowledge.

Thanksgiving Potluck (16 November 2018)

Right before students left campus for Thanksgiving break, Berkeley SPS hosted a **Thanksgiving potluck** at the apartment roof of Project Coordinator Aini Xu. A thankful



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gathering of physics students each pitched in an **entrée**, **beverage**, or **desert**, collectively forming a formidable feast around which students could reflect on all the things that they were thankful for. At SPS, we were delighted to hear that one of those things was our **wholesome quantized community**.



SPS students enjoy a delicious thanksgiving meal at the Thanksgiving Potluck, sharing warm conversation and sprightly laughs. Events like these remind us to always be thankful for each other.

Laser Tag: SPS versus MUSA (5 April 2019)

On a busy school night, members from SPS met with the **Mathematics Undergraduate Student Association** (MUSA) across the lane at Evans Hall. Equipped with **laser pistols**, the ensuing **laser tag capture-the-flag** brawls decided once and for all the superior fundamental discipline. Rife with **risky tactical maneuvers** and **clever flag placements**, laser tag with MUSA was an exciting **interdepartmental bonding experience** and afforded these hard-working majors some **fresh air** and **good ol' grit and exercise**.



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Nicholas brandishing a laser pistol for the cross-club laser tag social with the Mathematics Undergraduate Student Association (MUSA), with which SPS shares a healthy rivalry and disagreements about the appropriate rounding of π . Physicists' extensive knowledge of lasers put the physics team at a marginal advantage, but mathematicians' extensive knowledge of constructed straight lines allowed them to fight back gallantly.

π Day Potluck (15 March 2019)

This year, we enthusiastically had our annual **π Day celebration** the day after π Day, 3/15 (which is acceptably precise for a physicist). This year, our celebration took the form of a **potluck** perfectly coinciding with **midterm season**. The potluck was hosted in collaboration with the **Department of Astronomy**, setup on the outdoor patio area outside of the astronomy building, **Campbell Hall**. The festivities were joined by a crowd of around **twenty students** with a **delightful excess of pies** to wolf down. The clichéd round deserts were supplemented by meals from a variety of **different cultures**, including **fried rice, scallion pancakes, pizza, pita bread with hummus, brownies**, and more. Some played **card games** while others just **bantered** around and caught up with friends, but everyone appreciated the brief stress-less hour in the face of midterms.

Karaoke Night (5 April 2019)

With the SPS social scene buzzing, Berkeley SPS decided to take advantage of our local karaoke hotspot. More than a **dozen SPS members** gathered together and showed up for **dinner** and **karaoke jam** featuring hits from **Taylor Swift, Queen, Toto**, and more! Students were surprised at each other's vocal skills (and Peter's tambourine prowess) and will definitely be back for more next semester.



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(from left to right) Peter, Mayia, Patrick, and Nicholas unwinding to a wholesome, raucous karaoke night. These physics fellows covered all frequencies of the sound spectrum in cacophonous renditions of Let It Go, All Star, and Africa by Toto.

Professional Development

In addition to its social support role, Berkeley SPS is dedicated to promoting **career success** through **professional development events**, oftentimes in conjunction with the Department of Physics proper. The Berkeley chapter regularly holds **panels**, **workshops**, and **activities** in order to ensure **academic** and **professional success** during the college years and beyond, to the significant appreciation of students in the department.

How to Get Research (26 September 2018)

Early in the semester, Berkeley SPS preempted the usual barrage of questions about how to get research by holding a meeting about, well, **how to get research**. Officers Nicholas Rui and Rahul Sahay facilitated a **fruitful discussion** where students were free to ask questions about the **acquisition** and **day-to-day responsibilities** of an **undergraduate research position**. Ultimately, the meeting scratched an annual psychological itch in the department, and Berkeley SPS looks forward to having to do it again each year for many years to come.

Summer Research Panel (14 November 2019)



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During one general meeting, SPS gathered together four students who had prior success in **summer research**, representing the **SURF**, **Haas Scholars**, **UC LEADS**, and **REU** programs. Panelists espoused their personal experiences and shared sources of research funding. Students in attendance heard about how to get **involved**, **program logistics**, and **requirements** and **deliverables**. The panel was immensely helpful for students searching for a productive (and fun!) thing to do over the impending summer.



(from left to right) Mayia, Ivan, Julia, and Nicholas sharing their experiences with summer research. As accomplished undergraduate researchers, these upperclassmen share their hard-fought professional wisdom with curious students (in exchange for questionably healthy snacks, foreground).

Summer Internship Panel (15 November 2019)

This **Summer Internship Panel** was strategically timed to help students with their applications to **summer internships** in **industry**. The panel was comprised of one junior, Miela, who interned at The Aerospace Corporation the previous summer, and four seniors, Jordan, Chelsea, Anna, and Emily, who interned at Psi Quantum, Planet, Electronic Theatre Controls, and IBM, respectively. The students shared their wisdom regarding **finding internships**, **sprucing up resumes**, **communicating via LinkedIn**, and the joys of **phone**



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and in-person interviews. Afterwards, a representative from the Career Center and the fabulous Department Advisor Amanda Dillon gave **resume advice**.



(from left to right) Miela, Jordan, Chelsea, Anna, and Emily sitting on the Summer Internship Panel. Students heard the experiences of battle-weathered job applicants with recent successes in their job hunts.

Career Panel (19 March 2019)

The **Career Panel** served as a way to show students the options available to them outside of academia. A network of former physics majors, including several recent grads, came to talk about their careers. This included a **high school physics teacher**, a **quantum software engineer at Rigetti**, a **data scientist at JPL**, a **software engineer at Lawrence Berkeley National Labs**, and a **systems engineer at Varian Medical Systems**. Students enjoyed pizza and asked lots of questions about the job hunt, how physics could be used in industry, and more.

Graduate School Panel (16 April 2019)

The **Graduate School Panel**, held near the end of the school year in April, was specifically targeted at sophomores and juniors who were looking to get started on the application process. The panel was comprised of **Anisha Singh**, a recent Berkeley undergraduate and current first-year grad student at Stanford, **Helia Kamal**, a current Berkeley grad student, **Joelle Miles**, the grad student advisor at Berkeley, **Glenn Richardson**, a current Berkeley senior who went through the application process and ultimately decided to work instead, and **Karen Yu** and **Liza Tremsina**, current Berkeley students planning to attend Columbia

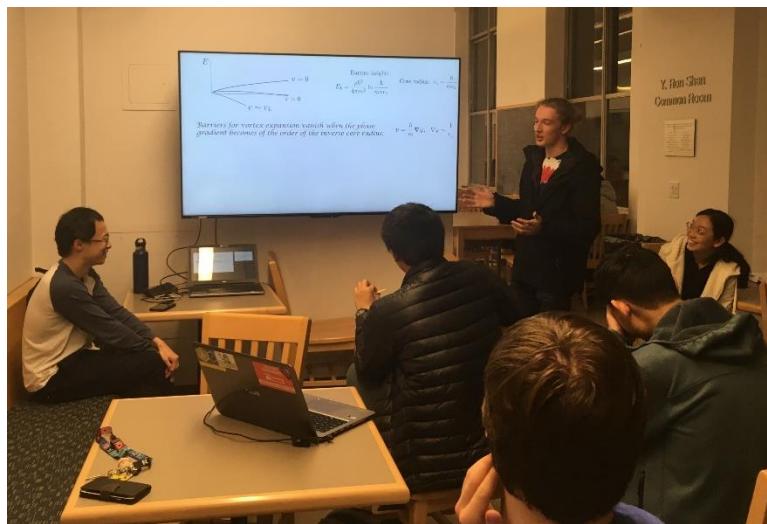


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and MIT, respectively, in the fall as grad students. This diversity of perspectives and opinions allowed students to ask questions about all aspects of the grad school application process, as well as what life in grad school is like.

Slides Game (17 April 2019)

Key to success in both academia and industry is the ability to present effectively. At the **Slides Game** general meeting, willing participants deliver **impromptu one-minute talks** using slides they have never seen before presented at actual conferences. This activity was followed by a **slide-by-slide discussion** of good and bad presentation design. While also exercising the ability of physics students to think on their feet, the game also provoked discussion about clear communication in a professional setting.



Students look on in amusement as Charlie gives a tortured, extemporaneous presentation of half a slide without context. The audience enjoyed Charlie's expert discussion of "barriers for vortex expansion vanish[ing] when the phase gradient becomes of the order of the inverse core radius," whatever that means.

Imposter Syndrome Workshop (25 April 2019)

This year, our SPS chapter was intent on making a positive impact on the **department climate**. For the first time, with the support of the department, we hosted a **workshop on the imposter syndrome**, a feeling of impostorism commonly felt among people in STEM which is particularly strong for women and minorities.

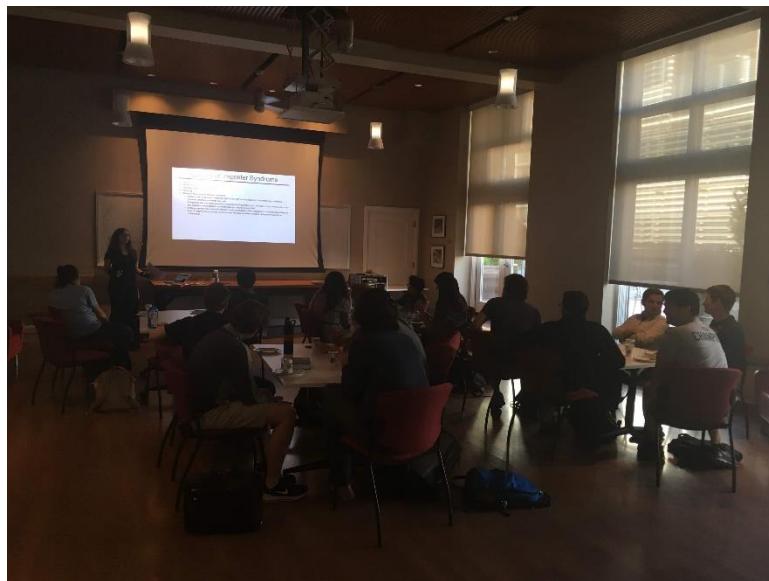
The intimate workshop was hosted at dinnertime with the attendance of over 20 students from a **diverse variety of backgrounds**. Participants learned about the wide scope of research conducted around the imposter syndrome; studies on its **causes, symptoms,**



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treatments, and its **impact** on **race** and **gender**, as well as methods to combat the syndrome. There was also a discussion component to the workshop, where participants talked in small groups about their own imposter thoughts in a safe environment.

Overall, the workshop was **very positively received** by everyone in attendance, and attendees and the future board have expressed interest in repeating the workshop next year with the hopes of reaching a broader audience. Though the workshop was small this year, however, it initiated an important discussion which participants carried with them outside and have continued with their colleagues in physics.



Mayia, co-president and eternal queen of SPS, gives an insightful presentation about imposter syndrome to onlooking students. A common psychological affliction of students at the top public university in the world, imposterism is a condition best fought with friendship and a healthy dose of self-esteem.

International Physics Tournament

This year, our projects division at SPS decided to take on the world at the **International Physicists' Tournament (IPT, iptnet.info/)**, which pits students **across the world** against each other in **technically challenging physics problems**. Throughout the year students worked on such groundbreaking problems as how to build a functioning radio using a potato battery, ultimately presenting their results in **Lausanne, Switzerland** to teams from other countries.

To compete for the spot of national champion and representative of the United States at IPT, Berkeley SPS formed **two teams of five to six members** each and hosted the national



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tournament. Bi-weekly meetings were held during which teams could ask questions about the tournament and discuss competition. In **November**, professors, postdocs, and undergraduates alike gathered to present, debate and review their solutions. After an intense day of presentation, opposition, and review, the winning team was decided.

Equipped with a newfound zest and zeal, "Dr. Hamiltonian and the Quantets," now official reigning United States champions and representatives of the USA at IPT, proceeded to further refine and work on additional problems until the international tournament in April. Wrought with many all-nighters and efforts to raise funds for traveling, the team came to the brink of despair. Ultimately, however, a combination of **donations from private industry**, a **GoFundMe page**, **scholarships** from the student government at Berkeley, and a **generous donation from Berkeley's Physics Department**, the team found themselves, solutions in hand, within the snowy mountain troughs of Switzerland.

At the competition, Dr. Hamiltonian and the Quantets bested some of their opponents and lost to others. Throughout it all, they enjoyed deep and insightful conversations, both about physics and the cultures of other countries. After five days of debates and exploration, they walked away tired but content, defeated but educated, ready for another round next year.

The activity, which was introduced to UC Berkeley this past academic year, was received so positively that we plan to continue and expand support for Berkeley's participation in IPT in future years. There is already ongoing work to find more consistent sources of funding and to encourage participation of other schools in the UC system.

National Competition Teams

"Dr. Hamiltonian and the Quantets"	"Gaussian Seashell"
Anthony Khodanian	Ivan Chernyshev
Shantanu Kadam	Xuyang Yu
Che Liu	Christopher Leong
Miguel Ceja	Zeraki-Tobias Stover
Paul Lictmacher	Xuanchen Jia
Guillaume Shippee	

USA Representing Team at Lausanne

"Dr. Hamiltonian and the Quantets"

Anthony Khodanian



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Shantanu Kadam

Miguel Ceja

Guillaume Shippee

Xuyang Yu

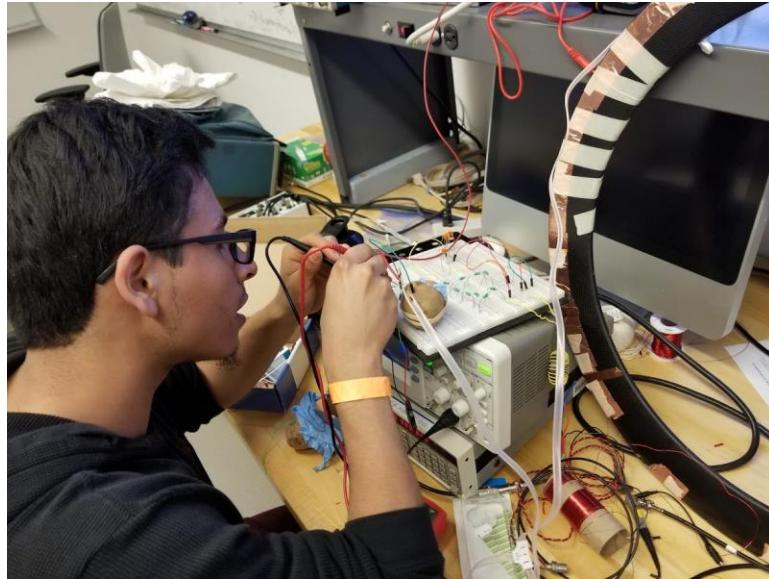
Jaime Zendejas



Students compete at the national USA IPT competition, held in our very own LeConte Hall. Judges and spectators look on, musing over the performances they have just witnessed.



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Jaime takes a voltage measurement on the USA IPT team's radio setup, taking care not to leave off the most important component: a potato. The strange but thought-provoking set of prompts provided by IPT forces students to think on their feet.

The screenshot shows a GoFundMe campaign page. At the top, it says "gofundme" and has search and start buttons. Below that is a banner for "PHYSICS FACULTY NOBEL LAUREATES" with the quote "TO RECOGNIZE 'THOSE WHO HAVE CONFERRED THE GREATEST BENEFIT ON MANKIND.'—ALFRED NOBEL". The main image is a group photo of six people. To the right, a progress bar shows "\$1,575 of \$8,500" with a green bar and a heart icon. It also says "Raised by 13 people in 3 months". Below the progress bar are "Donate" and "Share on" buttons. Further down, it says "Created February 7, 2019" and lists "Dr. Hamiltonian" as the campaign owner, located in Berkeley, CA. A "Recent Donations" section shows a recent donation from "Dianne Wentw" of \$25 made 2 months ago. At the bottom, there are share and tweet buttons.

UC Berkeley's participation in IPT required a lot of fundraising, including in part a GoFundMe page ([above, gofundme.com/us-team-participation-at-physicists-tournament/](https://gofundme.com/us-team-participation-at-physicists-tournament)) which attracted the patronage of a large number of donations from the general public.



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(from left to right) Shantanu Kadam, Miguel Ceja, Anthony "Dr. Hamiltonian" Khodanian, Xuyang Yu, and Guillaume Shippee pose in front of picturesque mountains in Switzerland. When not vigorously preparing for IPT, our epic voyagers explored the breathtaking European landscape.

"Meetings with Amanda"

This year, our chapter focused on establishing ourselves further in the physics community. Through **weekly meetings** between the **presidents** and a **staff advisor**, we were able to communicate our goals, receive greater support from the department, and advertise important events hosted by the department to our members. We also were able to communicate students' feedback about the department, and helped the department hear students' voices by encouraging students to fill out course evaluations and reach out to the appropriate committee members with specific feedback. Through this connection, SPS facilitates greater representation of undergraduate voices in department administration.



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SPS Presidents Emily (left) and Mayia (right) pose with Physics Undergraduate Advisor Amanda Dillon (center) at the Physics and Astronomy commencement ceremony. After four years of academic support, numerous meetings, and playful repartee, the moment is a bittersweet goodbye.

Faculty-Student Lunches

Faculty-Student lunches are a series of **luncheons** sponsored by the Department of Physics here at Berkeley. The program aims to reduce undergraduate anxiety in **approaching professors** and attending office hours by giving physics faculty a friendly human face outside of a traditional classroom setting. Two faculty-student lunch coordinators arrange and guide (requested) professors to discuss **research opportunities**, **various aspects of physics**, and other interesting topics with students over pizza. Many undergraduates have attended the lunches and have since been inspired to get involved with research and industry.

This year, SPS sponsored **fourteen lunches** with cumulative attendance of over **200 students** over the academic year. We list below the dates of faculty-student lunches throughout the 2018-2019 school year alongside participating faculty.

Faculty-Student Lunch Schedule

13 September 2018	Bob Jacobsen
18 September 2018	Yury Kolomensky
2 October 2018	Austin Hedeman
10 October 2018	Wick Haxton
25 October 2018	Frances Hellman



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15 November 2018	Dan Stamper-Kurn
11 February 2019	Norman Yao
21 February 2019	Heather Gray
4 March 2019	Barbara Jacak
8 March 2019	Hernan Garcia
18 March 2019	Jessica Lu
8 April 2019	James Analytis
18 April 2019	Dmitry Budker
6 May 2019	Alessandra Lanzara



Erika, faculty-student lunch coordinator, cordially introduces Professor Bob Jacobsen to a crowd of awaiting undergraduates. Jacobsen, who is Dean of Undergraduate Students at the College of Letters and Science, regales students with tales from administration.



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Professor Dmitry "Dima" Budker (atomic, molecular, optical physics) regales interested students with tales from physics academia. Professor Emeritus Budker, who currently serves as a professor of Johannes Gutenberg University in Mainz, enthusiastically passes his wisdom forward to the next generation of physicists.



Students sit captivated at a student-faculty lunch. Attending students listen in on inspiring stories, career progression, and interesting science, and participating faculty attain personal, altruistic gratification (and virtually a limitless number of pizza slices) for their troubles.

SPS Barbecues

Roughly once every three weeks, Berkeley SPS hosts a physics department **barbecue**. These events are fantastic opportunities for students, staff, and faculty to **socialize** and



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network while enjoying **good food** under **California sunshine**. These barbecues not only attract people within the physics department but also passers-by who are often drawn in by the thriving activity and enticing scents of grilled meat. These barbecues strengthen **interpersonal connections** in the department and are a fantastic **de facto networking event**. These barbecues are an important source of income for the club, doubling as a **powerful fundraising source** for our other activities.



Grillmaster Ethan (right) mans the grills at an SPS barbecue in the space between Birge and LeConte Halls, an area that witnesses significant foot traffic from students, faculty, and staff alike. Pairode (left) looks on with hungry fascination.



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(from left to right) Chelsea, Pairode, and Aini sharing a hearty meal at an SPS barbecue. SPS barbecues are not only a way to fill-up on all-American burgers and hot links but also to get some fresh air, hang out with friends, and conduct totally unstaged photo-ops such as this one.

Physics Homework Parties

At the beginning of the academic year, SPS **collaborated** with other physics student groups on campus including **SWPS** (Society of Women in the Physical Sciences), **Compass**, **ULAB** (Undergraduate Lab at Berkeley), **IGenSpectrum**, and the **STEMINIST Chronicles** to bring **Homework Parties** to the department. Modeled after a similar program in the **Department of Computer Science**, these “parties” provide a space for students to study in a **collaborative environment** and receive help and tutoring from older students who have previously taken their classes. The student groups took turns hosting these parties from 7:30-10:00pm every Wednesday evening during both Fall and Spring semesters, a responsibility which included publicizing the event, providing free snacks or dinner, and



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coordinating the logistics of the event. SPS hosted about five of these parties throughout the year.



A physics department homework party, where students collaborate on problem sets following the tradition of the 1927 Solvay Conference, during which the foundations of quantum mechanics were established (2019, colorized).

Undergraduate Seminars

This year, Berkeley SPS organized the Physics Department's first installment of **Undergraduate Seminar** evening talks which gives undergraduate physics and astronomy students a platform to present their research (or general topic of interest). These seminars were founded with (and delivered on) the intention of making research-level physics **more accessible** to younger students and further increasing **communication** between upperclassmen and lowerclassmen. The seminars were also a fruitful networking avenue through which lowerclassmen were able to seek out upperclassmen mentors, with more than ten lowerclassmen joining research groups as a direct consequence.



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A compilation of photos from all nineteen undergraduate seminars held by Berkeley SPS in this past school year. Attending students heard about topics from high-energy physics to geophysics to astronomy, continually having reinforced both the beauty of physics and the intellectual prowess of the students studying it.

Seminar Schedule

24 September 2018	Rahul Sahay <i>Neutrinos: Beyond the Standard Model!</i>
1 October 2018	Joshua Lin <i>Random Matrix Theory and Quantum Billiards</i>
8 October 2018	Jiabao Yang <i>Renormalization Group, Phase Transition, and Universality</i>
15 October 2018	Guillaume Shippee <i>Fun with Fast Radio Bursts</i>
22 October 2018	Mayia Vranas <i>Quantum Spin Liquids in the Kitaev Model: Real Examples of Exotic Magnetism</i>
29 October 2018	Nicholas Rapidis <i>Axions: A New Promising Dark Matter Candidate</i>



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5 November 2018	Yasmeen Musthafa <i>Phase Retrieval in Lensless Coherent Diffractive Imaging</i>
26 November 2018	Nicholas Rui <i>Dynamical Structure of the Quintuplet Cluster</i>
4 February 2019	Caolan John <i>An Introduction to Superconductivity</i>
11 February 2019	Noah Stevenson <i>Measuring non-Markovian quantum dynamics of superconducting qubits</i>
19 February 2019	Shishir Dholakia & Shashank Dholakia <i>Long Period Planets and Planetary Formation</i>
25 February 2019	Nick Choksi <i>Black Hole Binary Mergers in the Context of the ΛCDM Paradigm</i>
4 March 2019	Jordan Sullivan <i>Quantum Machine Learning</i>
11 March 2019	Karen Yu <i>Emergence in Biophysical Systems</i>
18 March 2019	Ivan Chernyshev <i>Bjorken-X spectrum in Quark-Gluon Plasmas at the LHC</i>
1 April 2019	Jyotirmai Singh <i>Crystals, Cavities, and Radios - Current and Future Dark Matter Detectors</i>
8 April 2019	Carter Turnbaugh <i>Continuous Laser Control of Electrons</i>
15 April 2019	Dalila Robledo <i>Electrostatic Potential Map of ALPHA's Penning-Malmberg Traps</i>
22 April 2019	Erika Hathaway <i>Earth's History from Geophysics</i>

Assassin

In the middle of Fall semester, SPS conducted a good ole' game of **Assassin**. The rules were deceptively simple: every player is assigned a target to "assassinate," by gently



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poking them in the back. If the target releases the plot, they can gain immunity by shouting **"24 hours."** Besides the safe zones at office hours, discussions, SPS meetings, and lectures, players were without refuge. Kills were documented on a hilarious, regularly updated **"killfeed"** on the **SPS Facebook page**. In addition to some old-fashioned fun, the game facilitated the interaction between SPS members, young and old, and allowed students who had schedule conflicts with SPS meetings to participate in the club.

Holiday Party Skit (5 December 2018)

As part of the Physics Department's end-of-year holiday celebration, the chapter was re-invited to perform its **annual holiday skit** on behalf of the undergraduate physics community. The skit, a **paragon of physics hilarity**, regaled listeners with the tale of a professor struggling to achieve tenure—it was a successful continuance of a tradition of the chapter's open relationship with the rest of the physics department.



(from left to right) Yonna, Ben, and Gabe engage in lively banter at the annual Physics Department Holiday Party. In the background, Sam and Rahul hog the spotlight playing front-and-center roles the annual SPS Holiday Skit.

Prom (8 May 2019)

To celebrate the 2018-2019 academic year, Berkeley SPS hosted a **decorated prom night** full of **fun** and **cheer**. Attended by **over fifty undergraduates**, students mingled around **photobooths**, **boardgames**, and **videogames** while enjoying an Italian buffet style



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dinner and **dessert**. We also had the opportunity to congratulate graduating seniors and introduce some of the **incoming Berkeley SPS officers** for the 2019-2020 school year. Everyone had a great time and reflected on a great year for SPS, while many are already looking forward to next year's prom!



(from left to right) Emily, Richard, Aini, Yonna, and Mayia on a short excursion for prom supplies, in and of itself a bonding experience to remember. The balloon bouquet floating up behind our heroic protagonists foreshadows the grandiosity of the gala to come.



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Following a tough school year, Berkeley physics students gorge themselves on a comprehensive Italian dinner from Gypsy's Trattoria Italiana, exquisite local cuisine demonstrating the highbrow nature of the event. This moment was captured by photographer extraordinaire Eden McEwen.



At SPS Prom 2019, Nicholas hesitantly receives Aini's affection. Meanwhile, in the background, a riveting conversation causes Siddhant to cover his face in shame.



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Patrick's proclamation of love to Arani thwarted by Siddhant, a moment memorialized in countless memes leading to marginally subcritical quantities of hilarity.



Part III: Interaction with Professional Physics Community

“It’s a lot easier to do good work when you have good words to say and work with good people.”

—Mark Harmon

Combining a **rigorous major curriculum** with **excellent research facilities**, Berkeley’s physics program consistently provides pathways for undergraduate students to participate in **cutting-edge science**. This past year, Berkeley’s undergraduates have left **deep footprints** in the academic landscapes of physics and astronomy, upholding the school’s long history of **pushing the frontier of human knowledge**. To this point, we summarize below the participation of UCB physics students in academic research: their participation in conferences, refereed publications, and so on.

Conference Attendance

(1) **Ivan Chernyshev**. *Measurements of photon-jet correlations in pp and p+Pb collisions with the ALICE detector at the LHC*. 5th Joint Meeting of the APS Division of Nuclear Physics and the Physical Society of Japan, Waikoloa, HI, October 2018. (contributed poster)

(2) **Nick Choksi**. *Formation of stars and massive clusters in dwarf galaxies over cosmic time*. Formation of stars and massive clusters in dwarf galaxies over cosmic time, Leiden, Netherlands, February 2019. (invited talk)

(3) **Mayia Vranas** et al. *Spin-Glass Behavior in Hole-Doped Lithium Iridates*. APS March Meeting 2019, Boston, MA, March 2019. (contributed talk)

Refereed Publications

(1) El-Badry, K.; Quataert, E.; Weisz, D. R.; **Choksi, N.**; Boylan-Kolchin, M.; *The formation and hierarchical assembly of globular cluster populations*. Mon. Notices Royal Astron. Soc., 2018.

(2) Frandsen, B. A.; Taddei, K. M.; Bugaris, D. E.; Stadel, R.; Yi, M.; **Acharya, A.**; Osborn, R.; Rosenkranz, S.; Chmaisssem, O.; Birgeneau, R. J.; *Widespread orthorhombic fluctuations in the (Sr,Na)Fe₂As₂ family of superconductors*. Phys. Rev. B, 2018.

(3) Mittiga, T.; Hsieh, S.; Zu, C.; Kobrin, B.; Machado, F.; Bhattacharyya, P.; **Rui, N. Z.**; Jarmola, A.; Choi, S.; Budker, D.; Yao, N. Y.; *Imaging the local charge environment of nitrogen-vacancy centers in diamond*. Phys. Rev. Lett., 2018.

(4) **Rapidis, N. M.**; Lewis, S. M.; van Bibber, K. A.; Characterization of the HAYSTAC axion dark matter search cavity using microwave measurement and simulation techniques. Rev. Sci. Instrum, 2019.



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- (5) **Choksi, N.**; Volonteri, M.; Colpi, M.; Gnedin, O. Y.; Li, H.; *The Star Clusters That Make Black Hole Binaries across Cosmic Time*. *Astrophys. J.*, 2019.
- (6) Molter, E.; de Pater, I.; et al. [+23 incl. **Hsu, A. I.**]; *Analysis of Neptune's 2017 bright equatorial storm*. *Icarus*, 2019.
- (7) **Choksi, N.**; Gnedin, O. Y.; *Formation of globular cluster systems – II. Impact of the cut-off of the cluster initial mass function*. *Mon. Notices Royal Astron. Soc.*, 2019.
- (8) Simon, A. A.; Wong, M. H.; **Hsu, A. I.**; *Formation of a New Great Dark Spot on Neptune in 2018*. *Geophys. Res. Lett.*, 2019.
- (9) **Hsu, A. I.**; Wong, M. H.; Simon, A. A.; *Lifetimes and Occurrence Rates of Dark Vortices on Neptune from 25 Years of Hubble Space Telescope Images*. *Astron. J.*, 2019.
- (10) **Rui, N. Z.**; Hosek Jr., M. W.; Lu, J. R.; Clarkson, W. I.; Anderson, J.; Morris, M. R.; Ghez, A. M.; *The Quintuplet Cluster: Extended Structure and Tidal Radius*. *Astrophys. J.*, 2019.
- (11) Gilbert, S. M.; **Molnar, A.**; Horton-Bailey, D.; Yao, H.; Zettl, A.; *Strain-controlled Graphene-Polymer Angular Actuator*. (accepted to *MRS Adv.*)

Pending Submissions

- (1) Hsieh, S.; Bhattacharyya, P.; Zu, C.; Mittiga, T.; Smart, T. J.; Machado, F.; Kobrin, B.; Höhn, T. O.; **Rui, N. Z.**; Kamrani, M.; Chatterjee, S.; Choi, S.; Zaletel, M.; Struzhkin, V. V.; Moore, J. E.; Levitas, V. I.; Jeanloz, R.; Yao, N. Y.; *Imaging stress and magnetism at high pressures using a nanoscale quantum sensor*. (submitted to *Science*)
- (2) Niu, C.; Wang, Q.; MacMahon, D.; Wu, F.; Chen, X.; Li, J.; Tian, H.; **Shippee, G.**; Werthimer, D.; Zheng, X.; *The Design and Implementation of a ROACH2+GPU based Correlator on the Tianlai Dish Array*. (submitted to *Res. Astron. Astrophys.*)
- (3) **Choksi, N.**; Gnedin, O. Y.; *Origins of scaling relations of globular cluster systems*. (submitted to *Mon. Notices Royal Astron. Soc.*)
- (4) Ruiz, A.; Nagarajan, V.; **Vranas, M.**; Lopez, G.; McCandless, G. T.; Kimchi, I.; Chan, J. Y.; Breznay, N. P.; Frano, A.; Frandsen, B. A.; Analytis, J. G.; *Hidden spin-orbital order in the Kitaev hyperhoneycombs*. (submitted to *Phys. Rev. X*)

Other Publications

- (1) Hosek Jr., M. W.; Lu, J. R.; Andersen, M.; Do, T.; Kim, D.; **Rui, N. Z.**; Boyle, P.; Williams, B. F.; Chakrabarti, S.; Beaton, R. L.; *The Stellar Initial Mass Function Across Different Environments*. Astro2020 White Paper, 2019.



Berkeley SPS also wishes to congratulate the following graduating seniors who will begin graduate degree programs in the fall:

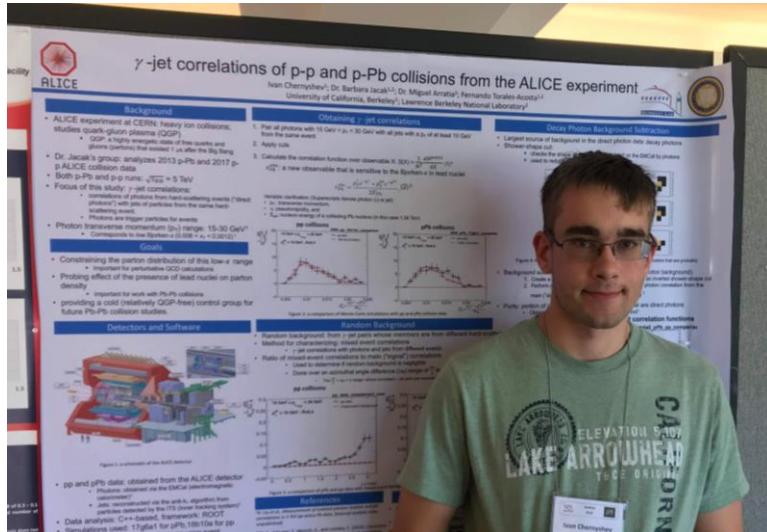


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Sanyum Channa (Stanford)
 Nick Choksi (UC Berkeley)
 Matthew Chow (UNM)
 Spencer Doyle (Harvard)
 Alexander Frenkel (Stanford)
 Lee Hagaman (Yale)
 Jiashu Han (UCSD)

Julia Hestenes (Columbia)
 Yifan Hong (CU Boulder)
 Pairode Jaroensri (UT Austin)
 Caolan John (MIT)
 Peter Lalor (MIT)
 Jackson Michalski (Georgia Tech)
 Yasmeen Mustafa (UC Irvine)

Patrick Oare (MIT)
 Nicholas Rapidis (Stanford)
 Ben Safvati (Stanford)
 Dan Ferenc Segedin (Harvard)
 Jyotirmai Singh (Stanford)
 Raymond Tat (Stanford)
 Karen Yu (Columbia)



Ivan Chernyshev presenting results in high-energy physics at a meeting of the American Physical Society in Waikoloa, Hawaii. Ivan is a veteran member of Barbara Jacak's group, which investigates the nature of quark-gluon plasma.



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Mayia Vranas presenting ground-breaking work in the study of spin glasses and magnetism at the March Meeting of the American Physical Society. Mayia, who works with Professor James Analytis, has made extremely valuable contributions to the field of solid-state physics during her undergraduate tenure at Berkeley.



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Part IV: Off-campus Engagement

“Teach love, generosity, good manners and some of that will drift from the classroom to the home and who knows, the children will be educating the parents.”

—Roger Moore

Berkeley SPS has a well-earned reputation for **public outreach** and **service to the community**. Students in Berkeley's Department of Physics recognize the impact of outreach on their own lives, and continually strive to pay that kindness forward to **future generations of physics students**. This year, Berkeley's SPS chapter participated in an unprecedented number of outreach events, reaching a large number of **young scientists** from all around the Bay.

Bay Area Science Festival (3 November 2018)

Together with **Science@Cal**, SPS headed to **AT&T Park** in San Francisco to demonstrate various physics concepts to kids of all ages for the **annual Bay Area Science Festival**. Due to our involvement in previous years, event organizers gave SPS a cozy spot at the **Teen Scene**, a quarter designed to encourage science interest in high school students (though with hefty foot-traffic from teens and non-teens alike).



Enthusiastic physics students grinning ear to ear following a day of volunteering at the Bay Area Science Festival at AT&T Park, San Francisco. Collectively, Bay Area Science Festival events reach 50,000 people per year and gives Berkeley SPS an opportunity to creative formative scientific experiences in the minds of future scientists.



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Day in the Life of a STEM Undergraduate (8 December 2018)

SPS partnered up with the **TRiO collaboration**, a group associated with Berkeley's **Disabled Students' Program**, in order to host the **Day in the Life of a STEM Undergraduate**, an event aimed at promoting future success among **underrepresented high school students** many of whom will be the first students in their families to attend university. **Professors Matt Pyle** and **Bob Jacobsen** gave **spirited talks** to students while **Professors Irfan Siddiqi** and **Holger Mueller** offered up their (superconducting qubit and atomic physics) laboratory spaces to **riveting tours**. The day ended with a panel of current undergraduate students sharing their words of wisdom.



At the Day in the Life of a STEM Undergraduate outreach event, a squadron of physics majors show off a large ($N \gg 1$) number of demos to onlooking high school students. In the eyes of young students, our volunteers can see themselves.

STEAM Night (22 February 2019)

SPS traveled to **John Muir Elementary School** to inspire the kids and parents there with the fun and magic of physics. Students lined up to be shocked by the van de Graaff generator and were delightful in their unbridled curiosity. Knowledge also flowed the other way, with undergraduate volunteers ohhing and ahing at elementary students' science projects.



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(from left to right) Rahul, Nicholas, Michael, Andrew, and Matt literally energize a young future scientist at John Muir Elementary School for STEAM Night. Between frequenting elementary school students' exhibits and charging up willing daredevils with the perfectly safe™ van de Graaff generator, volunteers' faith in humanity was confidently renewed.

Thousand Oaks Elementary School Science Fair (8 March 2019)

SPS returned to **Thousand Oaks Elementary School** for the third year in a row to demonstrate for the school science fair some of the most exciting physics demonstrations



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UC Berkeley has to offer. Between visiting various exhibits and playing with SPS's physics gadgets, much fun (and learning) was had!



Andrew cranks up a van de Graaff generator to charge up an excited student at the Thousand Oaks Elementary School Science Fair. As any Berkeley SPS volunteer knows, once you start getting involved in public outreach, you quickly gain a habit for complimenting people's hair.

Engineering 4 Kids Day (9 March 2019)

SPS teamed up with Berkeley's **Engineering 4 Kids Club** by participating in their annual **Engineering 4 Kids Day** hosted in UC Berkeley's very own **Wheeler Hall**. Berkeley SPS hosted a station at the event aimed at kids in elementary school and middle school. The station, entitled "**Fun with Physics: Literally Shocking!**," demonstrated some of the basic principles of **classical physics** as well as the fundamentals of **electricity and magnetism**. With **curious students** and **excited volunteers**, energy was high on both sides. This event marks SPS's second year of participation in the annual event, with no plans to stop anytime soon.



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(front, from left to right) Rastko, Nicholas, Rahul, Yilun, (back, from left to right) Andrew, Alexander, and Carter after Engineering 4 Kids Day posing with their weapon of choice, the van de Graaff generator. Even following hours of physics performance, morale runs high amongst our volunteer caravan.

Cal Day (13 April 2019)

At the campus-wide annual **Cal Day** event, Berkeley SPS sent a number of volunteers to the **resource fair**, a line of tables representing numerous on-campus **departments** and **organizations**. Volunteers gave **prescient advice** to prospective students and demonstrated a wide variety of experiments to the general public, including the famous **van de Graaff generator** and optical “**floating pig**” demonstration. Volunteers also handed out fliers and promoted **departmental talks** and **tours**, acting as **undergraduate physics representatives** encouraging wider participation in the department.

Berkeley SPS also had a strong presence at the **drop-in peer-advising session**, where representatives from SPS talked to **prospective students** and their families about the cultural and academic aspects of life at Berkeley, life as a physics and/or astrophysics major, and involvement in SPS. Both the students and their families had a great number of insightful questions to which the representatives responded in a kind and cheerful manner. Besides the advising session, several SPS officers also participated in the **advising panel**, in which prospective students and families asked questions regarding the **major**, **research opportunities**, and **post-bachelor decisions** such as the post-undergraduate choice between **graduate school** and **industry**.



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(left to right) Sam, Aini, Ruoyi, Emily, and Mayia man the SPS table at the third floor of LeConte, eager to induct new physics students into our local chapter. As with all things, it helps to get 'em early.



(front, from left to right) Chelsea, Sam, Nicholas, Xuyang, (back, from left to right) Charlie, Jaime, and Ethan posing for a photo at Cal Day after talking to new and prospective physics students waiting to talk to our fabulous undergraduate advisors, Amanda Dillon and Kathy Lee. These students volunteered the requisite optimism (and occasionally pessimism) to students looking to take their next academic steps.



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Physics and astrophysics majors on a curated panel discuss their experiences to prospective students and their parents on Cal Day. The public was given a slice-of-life look into the life of a Berkeley undergraduate in the physical sciences.



Part V: The SPS Mission

“The SPS exists to help students transform themselves into contributing members of the professional community. Course work develops only one range of skills. Other skills needed to flourish professionally include effective communication and personal interactions, leadership experience, establishing a personal network of contacts, presenting scholarly work in professional meetings and journals, and outreach services to the campus and local communities.”

—SPS’s mission statement

Who We Are

Boasting a campus of almost **42,000 students** in the 2018-2019 academic year, Berkeley is home to **300 physics majors**, **77 astrophysics majors**, and **72 engineering physics majors**. Within such a formidably large **microcosm** of **high-quality academics**, Berkeley’s SPS chapter’s dynamic presence as a support structure for physics students makes it stands out as a living **line-by-line affirmation** of SPS’s mission statement.

In upholding this legacy, the **Berkeley chapter** of the **Society of Physics students** remains faithfully and singularly devoted to its triplet purposes:

- To promote **professional** and **academic success**
- To foster a **strong sense** of **community**
- To spread an **appreciation of the physical sciences** through **public service**

Berkeley SPS is dedicated to creating a conducive environment for students’ **professional development**, whether they ultimately pursue a path in industry or academia. In addition to encouraging **collaboration** on homework assignments (via weekly homework parties), SPS has facilitated and promoted valuable informational events regarding the attainment (**How to Get Research general meeting**, **Summer Research Panel**) and presentation (**Undergraduate Seminars**, **Slides Game**) of research, as well as the acquisition of coveted internship positions (**Summer Internship Panel**). Via the **Graduate School and Career Panels**, our local chapter has ensured undergraduate support for numerous potential professional avenues. SPS events have allowed students to probe the myriad paths taken by faculty to their current positions à la frequent **Faculty Student Lunches**, and has been restlessly dedicated to promoting mental health (**Imposter Syndrome**) and diversity (**SWPS 101 general meeting**) within the department and, by proxy, the field of physics in general. Reflective of this support, Berkeley physics students are incredibly represented in the academic literature, and recent Berkeley physics alumni will go on to



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attend top graduate schools, take prominent industrial positions, and become educators for future generations of scientists.

Berkeley's SPS chapter also fills a unique niche in the Department of Physics through its **promotion** and **maintenance** of a **thriving undergraduate community**. The local chapter consistently works to circulate students around the department, creating **social**, **professional**, and **mentoring relationships** between undergraduates (**Meet and Greet and Mentorship Scavenger Hunt general meeting**) and with the graduate division and faculty (**barbecues**). In recognition of the importance of **mental health** and **self-help**, SPS has also facilitated numerous **de-stress events** including the **Origami**, **Movie Night**, and **Jeopardy general meetings** as well as numerous **potlucks**, **Karaoke Night**, and the crown jewel of SPS social events: **Prom**. SPS is the organization to which many physics students turn to celebrate such traditional holiday events as **Halloween** and the **Winter Holidays** (via **Secret Schrödinger** and the **Holiday Party Skit**) as well as **Valentine's Day** and, most importantly, **π Day**. Though no internal marketing research has been done, members surmise that SPS is one of the **liveliest** and **most genuinely wholesome** undergraduate communities on campus.

SPS also recognizes the tremendous impact of the previous generation of scientists in guiding and inspiring the current generation of aspiring physicists. In a bid to pay the kindness forward, Berkeley SPS is unequivocally devoted to **community service** and **outreach**, seeking both to spread their love of physics and to create numerous opportunities for the **upcoming generation of future scientists**. In addition to rallying dozens of undergraduates to outreach events at **Thousand Oaks (Thousand Oaks Science Fair)** and **John Muir (STEAM Night) Elementary Schools**, SPS has also received uncountably many enthusiastic students at **Engineering 4 Kids Day** in collaboration with a number of engineering clubs on campus (despite testy ongoing disagreements concerning the rounding of π). The K-12 done by SPS extends to upcoming first-generation college students in high school, of whom SPS is fervently supportive through events such as its second annual **Day in the Life of a STEM Undergraduate** in collaboration with local outreach organizations around the San Francisco Bay. On a society-wide scale, SPS has worked to reach the **general public** through the **Bay Area Science Festival** and **Cal Day** to produce a STEM-literate society that can both appreciate the beauty of science and better inform its decisions with empiricism. All-in-all, SPS acknowledges that the good physics requires an educated society with the opportunities that it needs to flourish.



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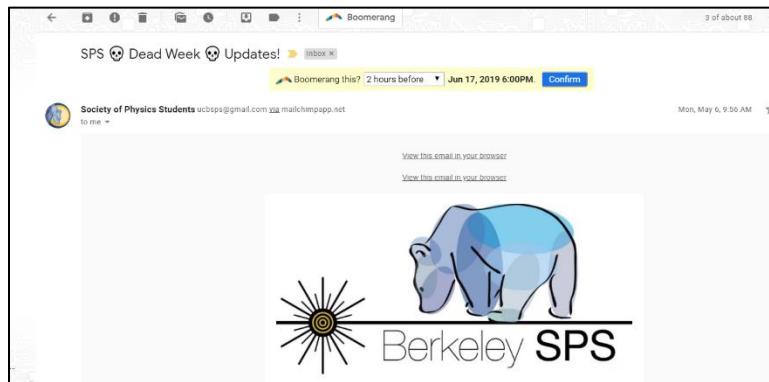
Hence a conclusion left unstated most days of the year, the Society of Physics Students chapter at the University California, Berkeley stands as a proud representative of the values outlined in the national organization's mission statement. The message described therein is one to which our local chapter has been and will for many years continue to be unapologetically committed.

Getting out the Word

Throughout this past academic year, Berkeley SPS has extensively utilized **technology** and **social media** to **get the word** out on the club's **numerous activities** and **community activism**. When it comes to all things "happening" at Berkeley's Department of Physics, Berkeley SPS wants everyone to know!

Email Newsletter

The club's de facto megaphone, SPS's **weekly newsletter** is disseminated to a vast, **554-member mailing list**. The newsletter contains all the club's hip happenings as well as various professional opportunities and other physics department miscellanea. Mailing list management is facilitated via **Mailchimp**, which stores member information as well as email templates, as well as keeping track of email analytics and reach. The newsletter has proven to be an effective email of communication.



What a member of SPS sees once a week when opening one of Berkeley SPS's world-famous weekly newsletters. The medium is a fresh voice in the physics department, advertising at times entertaining social events and intriguing career opportunities.

Facebook Group



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Day to day communications by SPS are conducted through the **SPS Facebook group**¹, through which students receive **up-to-date announcements** and **recent updates** about their favorite **social, professional**, and **outreach events**. Facebook is a daily go-to for any announcement that needs to be made on timescales faster than a week, and is also occasionally used for department-wide events such as the Assassin game.

The screenshot shows the Facebook group page for the UCB Society of Physics Students (SPS). The sidebar on the left includes links for About, Discussion (which is selected), Chats, Members, Events, Videos, Photos, Files, and a search bar. The main content area displays a post by Siddhant Mehrotra with the caption "I CAN'T WAIT TO SING SICKO MODE". Below it is a comment from Emily Glazer asking about officer positions and elections. A reply from Nicholas Rui is also visible. At the bottom of the feed, there are standard Facebook interaction buttons for Like, Comment, and Share.

The SPS Facebook group, a must-join forum for every physics major in the department worth their salt. The online space is home to fruitful discussion and hilarity all rolled into one thriving internet community and soapbox.

Website: sps.berkeley.edu/

At the beginning of the year, Berkeley SPS's **website** (sps.berkeley.edu/) underwent a substantial revamp. The website hosts an extensive **course advice page**, up-to-date **calendar**, and **comprehensive records** of our activities, allowing current majors, prospective students, and the general public to gain insight into SPS's **activities** and **outreach**. The Johns Hopkins University chapter, which visited the Berkeley campus in March, told us that they reached out to us because our website indicated that our chapter was active.

¹ <http://www.facebook.com/groups/474568829304662/>



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The screenshot shows a web browser window with the URL <https://sps.berkeley.edu>. The page title is "Advocacy". Below the title is a sub-headline: "We are the voice of physics undergraduates at the top public university in the world." A large photograph occupies the center of the page, depicting a group of people, including adults and children, gathered in front of a whiteboard covered in various drawings and writing, likely from an outreach event.

A screenshot of the homepage of the Berkeley SPS website showing off a picture of Outreach Coordinator Rahul Sahay at Engineering 4 Kids Day, 2018. The new website allows Berkeley SPS to get the word out on new and exciting things happening in the department.

SPS Instagram: @sps_berkeley

In March of this year, the **official Berkeley SPS Instagram account**, @sps_berkeley, was brought to fruition. The purpose of this account is to show a glimpse into the **day-to-day lives** of SPS members. Every week, the account is transferred to a new member, who will post throughout the week about the physics and non-physics shenanigans that make up their life. The account has been steadily increasing in popularity and currently has 138 followers. It has helped to **promote SPS events, encourage balanced lifestyles, and increase camaraderie** in the department.

SPS Instagram Schedule

11 March 2019 – 17 March 2019	Emily Glazer
18 March 2019 – 24 March 2019	Parker Trautwein
25 March 2019 – 31 March 2019	Nicholas Rui
1 April 2019 – 7 April 2019	Benjamin Lloyd
8 April 2019 – 14 April 2019	Aini Xu
15 April 2019 – 21 April 2019	Chelsea Chen
22 April 2019 – 28 April 2019	Shantanu Kadam
29 April 2019 – 5 May 2019	Jackson Michalski
6 May 2019 – 12 May 2019	Patrick Oare



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13 May 2019 – 19 May 2019	Nathan Cheng
20 May 2019 – 26 May 2019	Adam Corbo
27 May 2019 – 2 June 2019	Rahul Sahay
3 June 2019 – 9 June 2019	Kate LaMont
10 June 2019 – 16 June 2019	Siddhant Mehrotra



A highlight reel of photos posted to Berkeley's SPS Instagram account (@sps_berkeley) during its inaugural semester. The SPS Instagram has provided a colorful cross section of the lives of Berkeley physics students, both in and out of LeConte Hall.