

UNIVERSAL TIMES

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WE'RE BACK IN PERSON

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*photo by Louis G '22 of his observing team at the New Mexico Tech campus observatory,
four minute exposure on a Google Pixel 4a smartphone*



IT'S THE PEOPLE

Richard Bowdon '74, Executive Director

In 1998 SSP changed my life for the second time. I had done a bit of work for the original host campus, Thatcher School. "Don't pay me," I told them, "just buy me a ticket to spend a weekend at SSP this summer." That's when I met Steve Cotler '60, on campus to visit his son. Steve and I talked about SSP's transformative impact, and how to reinvigorate it. Fifteen months later we found ourselves, along with Chuck Holland '60, John Rabold '70, and AD Stuart Stephens, launching a new nonprofit to attempt just that.

In the 24 years since that weekend, I've been privileged to meet and work with so many amazing people, far too many to list.

"Papa, it's me. I made it, I'm here, I'm fine." Actually after "Papa" I was only guessing what Carmen was really saying excitedly to her father in Bucharest. It was Arrival Day in 2003, and the only way she could report her safe arrival to her parents was with my "long distance calling card" and the dorm pay phone.

"I'm very sorry, my flight to LAX lands at midnight, because I'm performing that afternoon at Kennedy Center. Can somebody pick me up?" asked Jonathan in 2012. Sure, good excuse, happy to. On the dark drive up the coast to Santa Barbara, he was too excited to sleep, so I gave him my regular "welcome to SSP" orientation speech.

Visiting NASA headquarters with Scott Pace '75, I learned everyone will stop him in the hallway to chat. Visiting Google headquarters with Russell Quong '78, I learned employees may bring fine wine to the company dining room. Visiting the White House with Noël Bakhtian '00, I learned how small the West Wing is.

As the late Dr. Dave Pierce used to say, "what makes SSP special is the people."

There's nothing ordinary about the Summer Science Program. Soon a new leader will take the reins, facing exciting opportunities and real challenges. Like you and everyone reading this Universal Times, I look forward to continuing to help this unique nonprofit to grow and thrive, wherever and whenever I can.

On that July weekend in 1998, Dr. Stephens graciously invited me to address the group. I still have that little talk, and it still rings so true that I gave it again on the last day of SSP '22 at UNC. "Keep in touch with your SSP colleagues," I said. "They will be interesting people doing interesting things for the next six or seven decades."



Our group in 1974 had the highest total mass of hair in SSP history.

Richard D. Bowdon, SSP '74
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In 1999 we didn't know much about running a summer program, but we knew how to get business cards.



participants work with the chemostat designed for SSP

“*At SSP, you not only grow as a scientist through early mornings and late nights at the lab, but also get to build some of the funniest and most supportive friendships in your life. You get to become part of a community of incredible people who you know will always have your back, from all across the world!*”

GET INVOLVED

You're reading the *Universal Times* because you support SSP's mission to give today's most promising teens "the educational experience of a lifetime." As 2023 approaches, think about how you might get involved in one new way. For example:

- donate to support financial aid (visit ssp.org/support)
- become an active member of an SSP group on social media
- volunteer for the Admissions or diversity, equity, and inclusion Committee (email sspalum@ssp.org)
- organize a meetup at your college



TAKE THE ALUMNI SURVEY

Moved? Started a new job?
In grad school? Let us know!

bit.ly/surveySSP



Deadline: November 30



PAYPAL



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VENMO



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LOVE AND DEDICATION

Dr. Amy Barr Mlinar, Chief Academic Officer

SSP '22 wasn't easy. After two summers of operating online, we ambitiously planned to operate six in-person programs, including our first at University of North Carolina and Indiana University. The new SSP in Genomics at Purdue had new faculty, curricular materials, using custom chemostats and software. At five of the programs, many directors were new to us, or had done SSP online only. I taught an experimental online short course in Modern Cosmology for students admitted but unable to attend due to visa bottlenecks. COVID outbreaks threatened every program. This all made the summer exciting for everyone.

In late June came astonishing news: the Center for Talented Youth (CTY) canceled dozens of summer programs the day before they were to start, due to a lack of staff. I think about this often. How did SSP manage to succeed under these trying conditions?

The answer is love. SSP is more than a job to all of us. We are held together by the love and dedication our faculty, participants, volunteers, and staff bring to the SSP family every day. Every faculty member gave it their all and then some. We overcame operational challenges including COVID restrictions, logistical snags, equipment challenges, and exhaustion, with humor, text messages, calls, memes, and most importantly, late-night WhatsApp chats.

Instead of falling to pieces, SSP experienced its finest hour in 2022, delivering our consistently phenomenal educational experience to a record number of participants across three challenging research projects. As we move into the future, SSP will continue to expand to new sites and new research, and continue to move from strength to strength. My hope is that the bonds forged in the crucible of 2022 will hold us in good stead moving forward.



NEW MEXICO TECH

Astrophysics Program

Dr. Adam Rengstorf, Academic Director



Some facilities differences greeted our return to New Mexico Tech, but important things remained the same: the upright piano in the dorm, our bus driver Bernice Anaya, the sleds for our field trip to the dunes at White Sands. And Barb Martinez, Bill Andersen, and I got to work together for the 7th consecutive summer.

Our TAs were rock stars all summer: Kathryn Chan '16, Eric He '17, Jessica Lee '17, and Benjamin Khoury '17. It was a pleasure working with them and introducing them to New Mexican cuisine and culture. The seven of us combined had 47 summers of SSP experience!

Just before we arrived, John Briggs '76 got a Celestron C-14 in working order. (Alumni from the recent years will remember John from his Astronomical Lyceum and his always memorable Closing Remarks.) Then “monsoon season” came early & strong, clouding out many nights. We’ve never had a car get stuck in the mud at the observatory ... I’ve never even seen mud at the observatory before! But with some inter-team data sharing, all 12 teams were able to find their asteroid, submit their data to the MPC, and determine the orbital elements.

This was SSP’s 20th year at NMT and I feel very fortunate to be AD there. I love the SSP family I’ve come to know over the years. And I love that we were able to bring another group of participants through the program and introduce 36 new alumni to SSP.



UNIVERSITY OF COLORADO BOULDER

Astrophysics Program

Dr. Mike Dubson '73, Academic Director

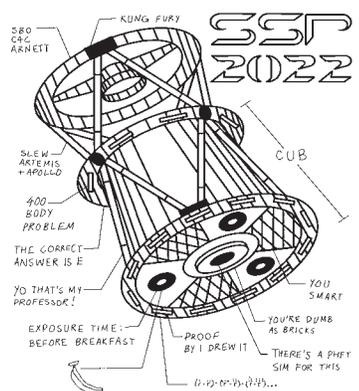


My 7th SSP summer either as participant or faculty was my best, with great people and great weather. Congratulations to the Admissions Committee for sending us a diverse mix of teens with great attitudes. They all felt invested in their teams’ success. My gratitude especially to our TAs, Peter Lande, Mia Liang, Julia Wang, Jessica Dong, and Grace Edwards. Their skill, dedication, and professionalism made them wonderful counselors and great role models to the occasionally overwhelmed participants.

It was a pleasure to work with my colleagues, Site Director Kelly Doyle and Associate AD Donovan Domingue. Both made my job almost easy. (Not easy, since I still had to put in 12+ hours daily.) Kelly monitored participants’ mental health to head-off more than few crises. Donovan took control of the Orbit Determination lectures and the observing. With smoke-free skies and clear weather, all teams got more than enough asteroid images to determine the orbits. There was much-less-than-normal last-minute participant panicking as the OD Report deadline approached.

Many participants commented on how difficult the Psets were, but how rewarding it was to work collaboratively on hard problems. We offered “challenge problems” to the better-prepared, which I would have found impossible at age 17. Some of their original solutions really surprised me.

Among the highlights of the program was the Dark Skies field trip. We had to schedule the bus in advance, and as the day approached, the weather forecast was grim. Some participants performed a “clear sky dance.” Did it work? The skies cleared at 9:30pm, the Milky Way appeared in all its glory, the clouds returned at 11pm. It was a great summer!





UNC CHAPEL HILL

Astrophysics Program

Dr. Michael Hannawald, Academic Director

The astrophysics program at UNC Chapel Hill was SSP's first on the east coast and my first SSP to teach in person. Veteran Dr. Agnès Kim taught the orbit determination and Dr. Aaron Bauer '06 taught Python. Rounding out our academic team were Associate AD Shanil Virani and TAs Joel Bernstein, Maddy Stratton, Maci Panariello and Aman Heyer '17. Site Director Dr. Nickey Ice took care of the participants' residential needs.

Launching SSP on a new campus is challenging. We were the first to use the campus observatory and its 24" telescope, following extensive renovation. It was several weeks before we had ironed out all the kinks. Cloudy nights also constrained observations. At least once a week, phones beeped an afternoon thunderstorm warning, and more than once it came so fast we arrived at the dining hall soaking wet. Weather notwithstanding, the mood stayed positive, participants worked hard on coding and tracking their asteroids, and in their free time ran integration contests until midnight.

Participants told us the guest speakers influenced their life goals. Dr. Nancy Chabot spoke about NASA's "DART" mission, Adrienne Erickcek gave us the latest updates in Cosmology, Dan Reichart described the worldwide Skynet telescope network he directs, and Richard Chuang '74 spoke about "The Infinite Space of Learning."

Our field trip on the 4th of July to the Durham Bulls baseball game was a highlight, a relaxing evening on the party deck with burgers and hot dogs, followed by a magical fireworks display.



PURDUE UNIVERSITY

Genomics Program

Dr. Michael Gribskov, Academic Director

This summer we launched our first-ever SSP program in genomics. Our program was ambitious: The students would breed antibiotic resistant bacteria (*Vibrio Natregens*) by growing them in a controlled environment (a chemostat) with increasing levels of different antibiotics. After isolating resistant strains of bacteria, we would determine the genomic sequence, and from the sequence determine the mechanism of antibiotic resistance.

Since we had never done a trial run of this program, it was an aggressive plan. As Murphy's law requires, we ran into numerous difficulties, first with the chemostat hardware and software, resulting in almost 10 days of 18-hour days at the beginning program. Thanks to the sustained efforts of the Assistant Academic Director, Dr. Michael Manzella, and our TAs Helen Cai, Logan Geyman, Sunita Nhemafuki, and Emma Wiesler, all the participants were ultimately able to isolate some resistant strains and to send the DNA for sequencing. Our struggles did not end there – the sequences we received turned out to be much shorter in length than expected – and the students struggled heroically to master the bioinformatics analysis using the Galaxy system. Ultimately the students prevailed and successfully identified completely novel antibiotic resistance mutations, and produced professional quality scientific posters summarizing their results.

With so many trials and tribulations, our site director, Christin Latus, played a key role in keeping the whole situation in hand, and the students were upbeat and optimistic, even at the most frustrating moments. I will never forget walking into the auditorium at 9:00 PM to find the students all singing together in an impromptu karaoke session. Just as we were approaching the finish line, one of the students and the academic director came down with COVID – but even that did not stop the group from completing their work.





PURDUE UNIVERSITY

Biochemistry Program

Dr. Mark Hall, Academic Director

Back in the lab again! After two challenging years trying to simulate biochemistry research in a virtual environment during the Covid pandemic, it was exciting to be able to get our hands dirty again with some real wet lab work. And to make things even better, SSP Biochemistry at Purdue had the privilege of using brand-new teaching laboratory facilities. The clean, bright, spacious labs and state-of-the-art equipment made a big impression on participants.

The Purdue-heavy instructional team included Chemistry professor Dr. Chitta Das as AAD, and Purdue Biochemistry grads Colin Hemme and Mica Lehe as TAs. The rock-solid TA team was rounded out by UCLA graduate Jamilla Situ and rising Worcester Polytech senior Gabrielle Paquette. Site Director Sushma Bana instilled an atmosphere of positivity and fun.

Field trips returned to the schedule! Ag biotech startup Inari offered an overview of CRISPR technology and its applications. We returned to Argonne National Lab in Chicago, and Corteva Agrisciences in Indianapolis. We joined the IU Biochemistry and Purdue Genomics programs at Turkey Run State Park for hiking and a picnic.

In the diverse and engaging guest speaker series, we heard about Mars exploration, the use of bioinformatics to tackle cancer, designing novel proteins, and chemical catalysts for use in green energy production. Dr. Tyrone Hayes gave his ever-popular talk on the environmental effects of pesticides. All speakers gave us interesting insights into their career paths.

Participants laughed and cried while bonding over the challenges of this fast-paced, intense antifungal design project. Their talent show featured music, dance, magic, and culminated with a full-group karaoke extravaganza. Everyone came away from the 6th SSP Biochemistry at Purdue with many wonderful memories.



INDIANA UNIVERSITY

Biochemistry Program

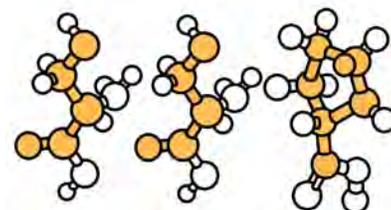
Jessica Hollenbeck, Academic Director

What do you get when you mix 36 participants, a new academic director, a new site director, and 4 new TAs on a campus that's never hosted the Summer Science Program? A summer full of camaraderie, spicy Ramen challenges, and memories that will last a lifetime!

2022 was the first onsite SSP at Indiana University and my first summer as Academic Director. Byron Chen came on board as Site Director, and we were joined by four new TAs: Emily Johnson, Trevor King, Emma Lawson, and Karena Tankersley. What we lacked in experience, we made up for in perseverance and dedication to a shared vision of giving the IU participants the "educational experience of a lifetime."

Highlights of our 5 ½ weeks together with the participants included (to the tune of the 12 Days of Christmas): 4 guest speakers, 3 out-of-town field trips, 2 bus breakdowns, 1 case of COVID ... and many, many polyacrylamide gels!

One of our first guest speakers, Nobel Laureate George Smith, emphasized the importance of collaboration. He told the participants over Zoom: "scientific discoveries are made by communities of scientists, not by individuals." Indeed, it was together that the participants experienced failed experiments and rejoiced over small error bars. I'm so proud of what our community of scientists accomplished. Thank you to everyone who played a part in that.



NEW

PROGRAMS & CAMPUSES

SIX PROGRAMS ON FIVE CAMPUSES DOING THREE PROJECTS



in the lab at the first SSP in Genomics

“*SSP has provided me with so much more knowledge about the universe than I could ever imagine in my high school years. It has shaped me as a person, as a future researcher, and has changed my perspectives on what I would like to do in my career.*”

“*SSP offered a perspective on what true academic curiosity looked like. Throwing out the grading system and giving genuine feedback to participants was an aspect of SSP that helped me learn more about myself and academia overall.*”



campus observatory at UNC Chapel Hill



Biochemistry participants at Indiana University

“*SSP is like walking through a tunnel. The first steps into the darkness are scary, but as you keep going, you can feel your pace growing steadier and footsteps turning into strides.*”

COLLEGE DESTINATIONS SSP '21

Brown

Kai C., Ryan D., Jaideep N., Sarah R., Edward S., Juwan S., Mike S.

Caltech

Umran K., Adelynn T.

Carnegie Mellon Univ.

Ethan L., Ayca B., Alex K., Taylor R.,

Columbia

James B., Peyton C., Emily Y.

Cornell

Ian B., Sarah B., Jodi H., Mackenzie H., Akshitha J., Ellen L., Christine M., Alex W.

Dartmouth

Alvina Z.

DePauw

Maheen M.'20

Duke

Amari C., Ardil T., Grant W., Jake W.

École Poly.

Berra D.

Georgia Tech

Atharva G., Vinny G.

Harvard

Henry C., Jang C., Justin J., Alice L., Andrew P., Lily S., Neil S., Joyce S., Jennifer S., Audrey Z.

Harvey Mudd

Ivan D., Antara K., McKenna M., Joaquin M., Lizzie R., Caroline S., Ananya V., Aaron Z.

Howard

Jay C.

Johns Hopkins

Tanvi R., Sai R., Tina S.

Karlsruher Inst. für Technologie

Sena T.

MIT

Abby L., Aleezay S., Alex G., Alor S., Andrew L., Anna L., Beverly M., Bronwyn B., Crystal T., Emma C., Erin C., Ethan N., Firaol L., Franklin W., Haedam I., Hyun K., Inimai S., Iris P., Izzy L., Jeremy Y., Jessica S., Katrina L., Kristin H., Maggie W., Morgan J.,

MIT (continued)

Pablo R., Rom F., Sanjana K., Sarah W., Sri S., Stephen S.

New York Univ.

Anushay A.

Northwestern

Salil C., Christopher L.'20

Oberlin

Hillary A.

Oxford Univ.

Judy L.

Politecnico di Torino

Nisa N.

Princeton

Angel N., Ari, Daisy Z., Jack Z., Jenny F., Kate P., Lucy W., Michael H., Nadja M., Sonal B.,

Purdue

Calvin C., Hayagreev D.

Rice

Jonathan C., Jeremy L.

Stanford

Alex G., Andrew G., Chenault E., Derek Y., Jack Z., Jonathan C., Lucas S., Matthew K., Natasha B., Sara S., Tushar D., William L.

SUNY Stony Brook

Anthony M., Neinei D.

UC Berkeley

Catherine D., Clara S., Elijah Q., Jolyn H., Siddharth C.

UC Santa Barbara

Tanay B.

UCLA

Alex P., Coco L., Sai K., Yanna Y.

Univ. of Alabama

Harshita C.

Univ. of Chicago

Sophia W.

Univ. of Florida

Abbie G.



campus observatory at CU Boulder

Univ. of Georgia

Chinmay J.

Univ. of Michigan

Akul S., Ethan S., Grant T., Isabel D.

Univ. of Minnesota

Rishabh S.

Univ. of Pennsylvania

Alvin X., Bowen Y., Caroline C., Mika Y., Sunny W., Tyler T.

Univ. of Pittsburgh

Rishabh B.

Univ. of Toronto

Ayush A.

Univ. of Virginia

Noelle K.

Univ. of Washington

Laavan S., Saraliba A.

Univ. of Wisconsin

Alex Y., Gerry E.

Univ. Southern Cal.

Sophia S.

Univ. of Texas

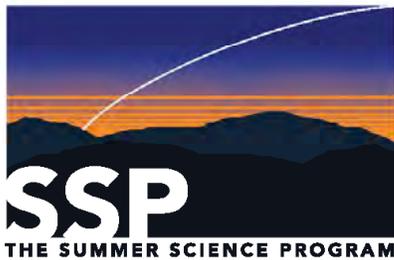
Yu L.

Washington Univ.

Giulissa C.

Yale

Aiden W., Alexander M., Amanda C., Andrew P., Andrew Y., Belle O., Daniel Z., Janice Y., Joey T., Matt N., Micah G., Pol B.'20, Steven D.



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Biochemistry participants at Purdue

LETTER FROM THE CHAIR

Dr. Ron Irving '68, Board Chair



With Richard Bowdon's retirement on November 30 as SSP's executive director, we bid farewell to a visionary leader. Richard has built SSP from one program in Ojai, California, to six programs on five campuses with three research areas serving over 200 bright teenagers. His implementation of our mission has ensured consistent excellence as we offer many more teens "the educational experience of a lifetime." They are challenged with rigorous, authentic, interdisciplinary research through an immersive, transformative experience that builds a diverse, life-long community. I am simultaneously grateful and in awe of Richard's accomplishments. Thank you, Richard.

I write this as we near the end of a search, led by Mike McKay '78, for Richard's successor. I am confident we will attract an outstanding new leader. I look forward to working with that leader, and with all of you, as we continue to expand to provide opportunities for more of our outstanding applicants.