



Community by Design

Richard Bowdon '74, Executive Director

“What makes SSP special is the people.” I first heard that truth from the late Dr. Dave Pierce, who taught on our faculty for fourteen summers. At each program, thirty-six teenagers and seven faculty form a social bubble, working hard and playing hard together almost every waking hour.

Even this summer and last, with everyone forced to interact on Zoom, close communities formed. That surprised them; not every online educational experience in the last twenty months has been so positive. But it didn't surprise me. Online or in person, SSP is designed to be inclusive.

These teenagers are hungry to “find their home planet,” their true peers. They discover 35 interesting colleagues from around the world, four role-model Teaching Assistant and Residential Mentors, two approachable college professors, and even a temporary new parent (the Site Director).

High school can be a grind, alternating between boring and hyper-competitive. For the first time, they find collaboration – helping each other – to be both necessary and rewarding.

It's an idyllic environment of learning together for the pure joy of it, free from worry that any mistake will “go on my permanent record.”

The word cloud on the cover of this Universal Times speaks volumes. And two participants wrote concise, eloquent descriptions of the SSP community: “tight-knit, intellectual, and friendly”; “so welcoming, so quirky, so passionate, so amazing.”

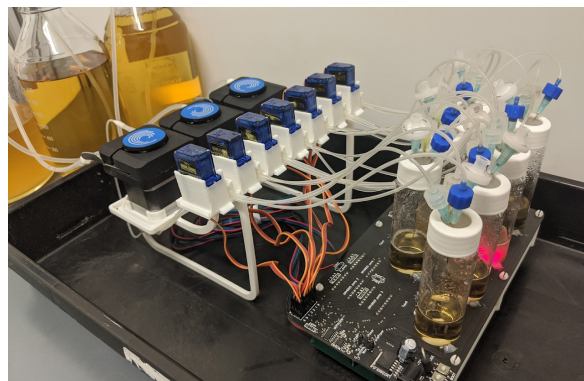


Genomics Project Update

Dr. Amy Barr Mlinar, Chief Academic Officer

The first SSP in Genomics will open at Purdue next summer ... also the first time two programs will run concurrently on the same campus. Leading the research will be Michael Gribskov of Purdue and Mike Manzella of Indiana University.

Dr. Gribskov has a joint appointment in biological sciences and computer science, expertise in bioinformatics, and prior experience with pre-college enrichment programs. Dr. Manzella has a PhD in Microbiology and Molecular Genetics from Michigan State. He has been leading this curriculum development since spring, and will teach the microbiology. They will work through the winter and spring to develop the schedule, lectures, assignments, and laboratory procedures.



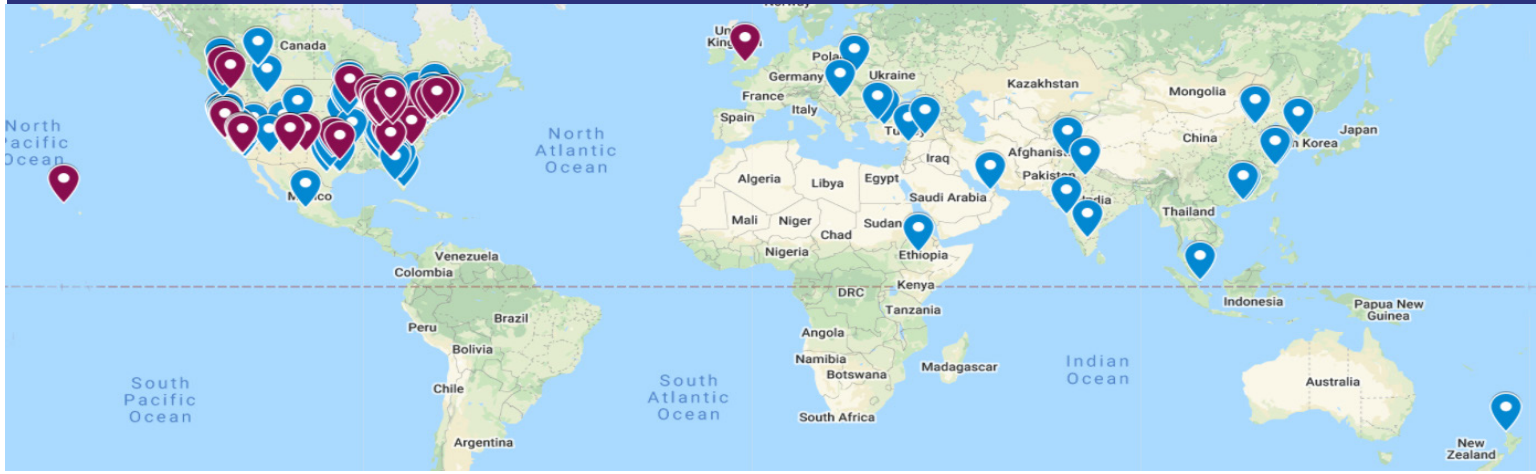
Read about it at replifactory.com.

Each team of three participants will have a chemostat apparatus, designed and built for us by Catalin Rusnac at the Institute for Science and Technology in Vienna. At Dr. Manzella's suggestion, they will experiment on *Vibrio natriegens*, a laboratory-attenuated strain of marine bacteria that grows fast and is non-pathogenic in humans. After inducing evolution of antibiotic resistance, each participant will analyze mutations in the whole genome taken from a specific chamber.

As ever, we are deeply committed to safety and ethical practices. We'll be guided by Purdue University safety protocols and advice from experts in antibiotic resistance and human health. Bioethics will be incorporated into the curriculum.

We are very excited to offer research in genomics and bioinformatics to high school juniors from around the world, and grateful to the anonymous alum whose generous grant made it possible.

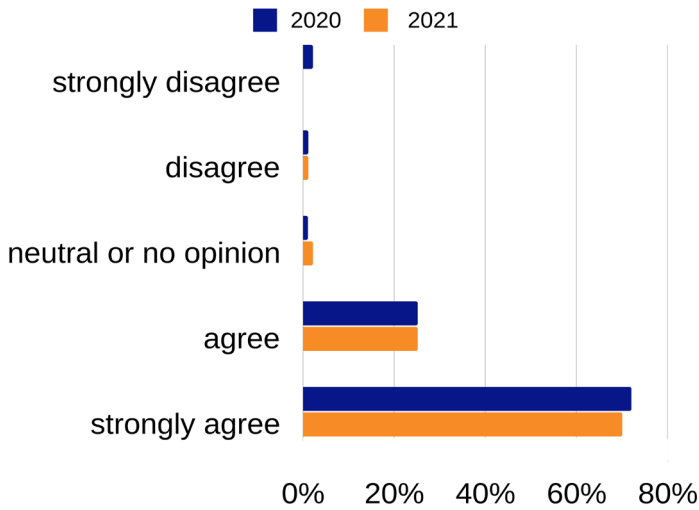
Five Online Global Communities



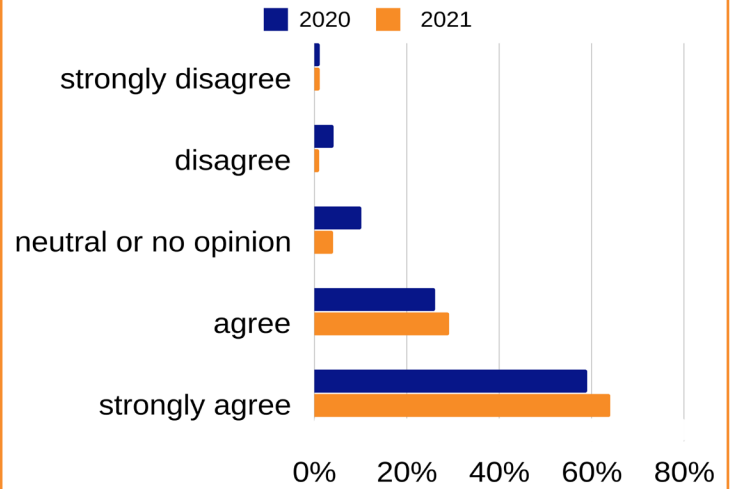
We scheduled eight hours per day of Zoom sessions for 215 people around the world.
2021 participants in blue, faculty in red.

From Exit Surveys 2018 – 2021

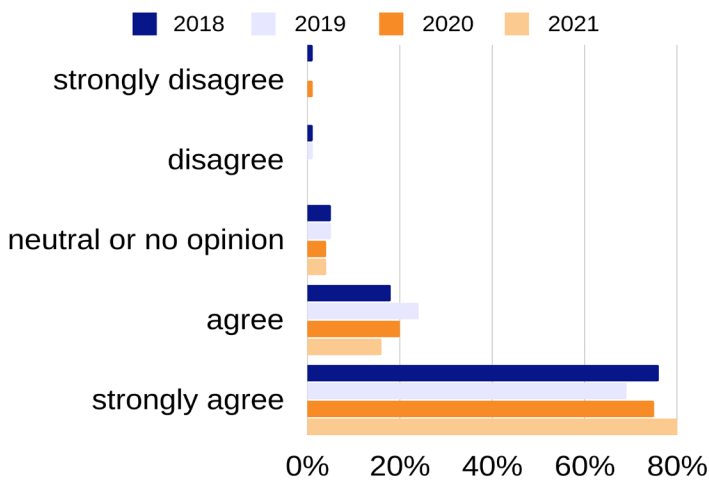
I felt welcomed and included in my SSP community.



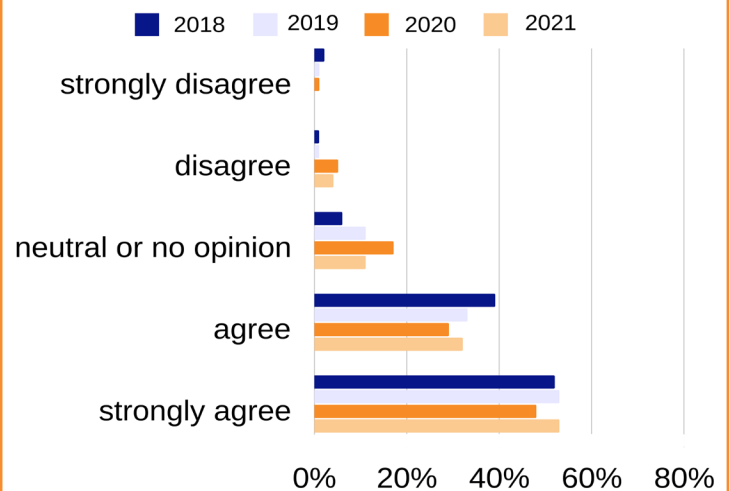
I became good friends with many other participants and plan to keep in touch.



helped me understand the nature and value of collaboration



taught me new social/people skills





New Mexico Tech

Astrophysics Program

Dr. Adam Rengstorf, Academic Director

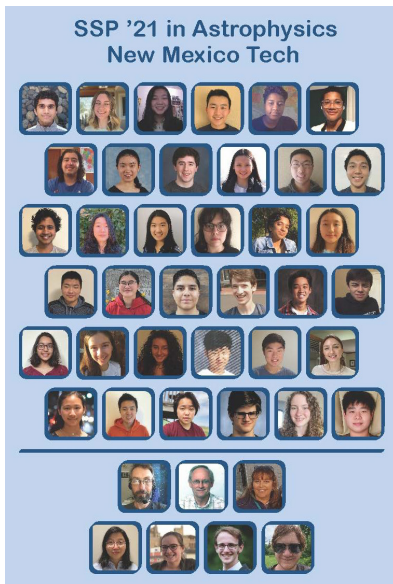
I approached this summer as a personal challenge. After 2020, we knew that we could pull off a virtual SSP, but could we improve it?

This was my 8th summer as Academic Director, working with Associate AD Dr. William Andersen, and my 6th with Site Director Barb Martinez. Dr. Aaron Bauer '06 returned to teach Python programming and Dr. Gillian Andersen put on her workshop on scientific writing – both necessary skills at SSP! TAs Katie Dunn '13, Abby Mintz '16, Michael Warren, and Tristan Weaver made my summer easy and enjoyable, bringing a lot of experience to the table.

Working closely with the other two Astro programs, we took asteroid images using the Skynet and iTelescope online observatory networks, plus our home campus observatories.

Participants stayed very busy with eight hours of interactive Zoom sessions every weekday. During two, 2-hour lecture blocks we covered topics needed to observe near-earth asteroids, analyze the images, and program the orbit determination. In between these sessions we scheduled an hour of purely social interaction – no work allowed! Each day concluded with three hours of combined office hours, study group, discussion forum, online gaming, and shenanigans.

All asteroids had convergent solutions, with only one recalcitrant enough to give marginal elements. Another successful SSP in the books!



University of Colorado Boulder

Astrophysics Program

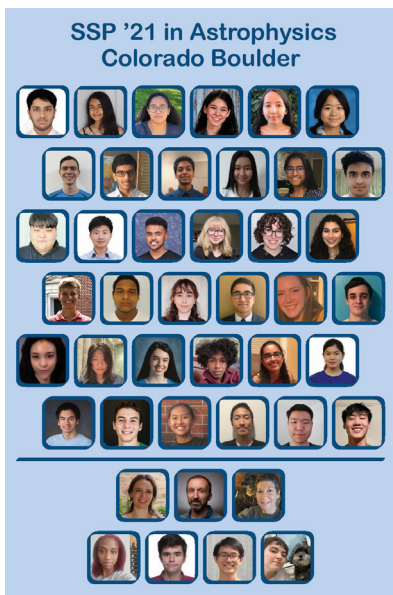
Dr. Agnès Kim, Academic Director

In my fourth summer as Academic Director for the CU Boulder program, most of our team was new to either SSP or me. By coincidence, both Associate AD Donovan Domingue and Site Director Dr. Nickey Ice joined us from Georgia. Our TA corps included alumni Afura Taylor '16, Andrei Eftime '17, and Dominick Joo '17, plus Molly Watstein, a physics and astronomy major.

All participants doing Astrophysics outside of North America were assigned to our program, so we worked with people every day in Europe, Africa, India, and Asia, and had to optimize the schedule for a wide range of time zones. The last daily session ended at 3 am in South Korea. Dr. Ice brought the idea of taking a “campus hour” break in the middle of the Learning Block. In the first week or so faculty led the break activities, then later the participants took over.

For observing, each program designated a senior observer (for us, AAD Dr. Domingue) and a junior observer (TA Molly). They managed the complex task of scheduling telescopes and distributing images.

Our participants braved various obstacles at home, including an exploding transformer that left one without power for half a week. In the end, they submitted their astrometry and photometry to the Minor Planet Center, and calculated orbital elements for their asteroids. Along the way, these 36 teenagers grew and formed strong friendships. They once again showed me that SSP'ers can do the near-impossible.





Purdue University

Biochemistry Program

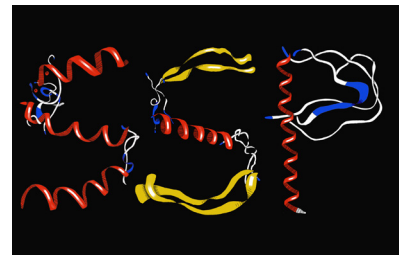
Dr. Mark Hall, Academic Director

SSP in Biochemistry during summer 2021 had a very welcome “business as usual” feel to it. After the hectic process of turning SSP into a virtual program at the last minute in 2020, this past summer was a more relaxing and enjoyable experience for the faculty. The result was the same – a stimulating and transformative educational experience for the participants.

Purdue Chemistry professor Dr. Chitta Das returned for his second go-round as AAD and Dr. Susan Park joined us as Site Director. Once again, our TA team was awesome! They accomplished the difficult task of making a Zoom-based program entertaining and exciting. Laney Flanagan '17 returned for her second summer, joined by fellow alum Molly Szpakowski '17. Purdue Biochem major Kyle Schulz teaches high school science. Colin Hemme, a rising senior in Biochemistry, rounded out the team.

Participants and faculty made the most of the online format again through group games and social activities. A fun-spirited “rap battle” with the Astro programs provided a new source of entertainment, and the yearly talent show was a hit, showcasing the many and diverse talents of our participants.

Credit goes to the participants for not letting the pandemic stop them from experiencing the Summer Science Program!



Indiana University

Biochemistry Program

Dr. Martha Oakley, Academic Director

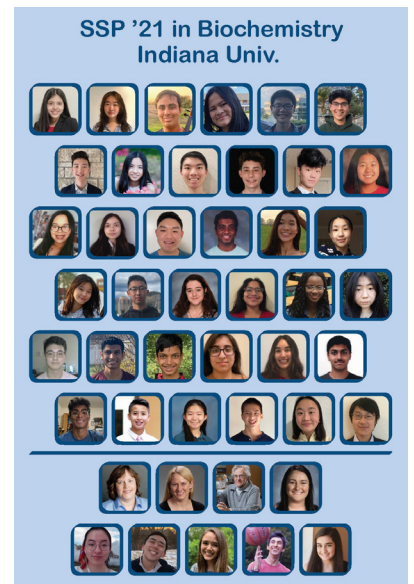
For our second virtual summer of Biochemistry “at” Indiana University, I returned as Academic Director, on a half-time basis due to my new job as IU Associate Vice Provost. Jessica Hollenbeck and Christin Latus returned as Associate AD and Site Director, respectively, and Jill Zeilstra-Ryalls joined the team as a second Associate AD.

We were lucky to host the reunion of Helen Cai '15 and Devin Srivastava '15 as TAs. They have uniquely strong connections to SSP and each other: colleagues in the Astro program, then again in the Biochemistry pilot in 2016, then both serving as Biochem TAs in different summers. Of the seven summers since 2015, Devin has spent four of them with SSP, and Helen five!

Kevin Tan '18 infused those long Zoom sessions with design flair and a sense of fun. Rachel Kalbfell thought as hard as anyone about how best to support every participant. Saj Desai worked only part-time but had an outsized impact.

Everyone on the faculty brought energy and enthusiasm remarkably undiminished by the intervening year of teaching in remote and hybrid formats.

It was a big ask of our participants to stay focused just as many places opened for the first time since the pandemic started. Nevertheless, this once again “felt like SSP.” These teenagers experienced the same challenges, victories, creativity, collaboration, and community that makes SSP so very special. Thanks to everyone involved for a wonderful summer!



Since 1959



Online

Astrophysics Program

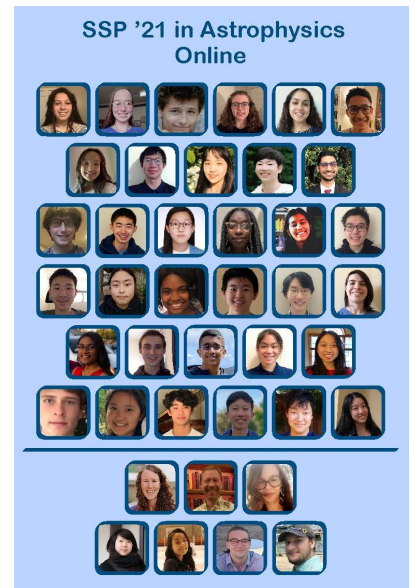
Dr. Cassandra Fallscheer, Academic Director

[Editor's note: Without a college campus to call home, not yet anyway, we chose to label our third Astrophysics program simply "online," abbreviated ONL.]

In my fifth summer at SSP and my first as Academic Director, I made "Hi Astronomers, Welcome!" our program's tagline. Associate AD Dr. Michael Hannawald joined us from Hawaii; Site Director Joni Mauldin returned as Site Director and Zhanpei Fang '14 as TA, with Kimberly Hou '17, Alan Tondryk '18, and Mason Tea completing the team. All contributed tremendous enthusiasm and passion to make the summer memorable, challenging, and supportive for all 36 participants. Special thanks go to Dr. Aaron Bauer for teaching Python and Dr. Gillian Andersen for her technical writing workshop, plus Drs. Raluca Rufu and Julien Salmon from Southwest Research Institute, who taught the capstone workshop on nonlinear orbital dynamics. Dr. Adam Rengstorf and I offered live observing sessions from our home campus observatories, the closest we could get to the SSP "hands-on" tradition.

Guest lectures gave us insight into what it takes to become a systems engineer or research astronomer, and got us thinking about the search for life elsewhere in the universe, among other topics. The Talent Show is always a joy for me. Many participants are talented musicians, others have highly developed athletic, comedic, or spatial skills.

This summer was another example of dedicated SSP'ers adapting to unprecedented times.



Stay Connected

SSP doesn't end in July ... it is a lifelong network and community of nearly 3,000 around the world, ages 16 to 79. There are many ways to stay connected. First and foremost, tell us when you move or change your email address! Just visit ssp.org/alumni.

Find us on your favorite social media platform – **Facebook, Instagram, Discord, YouTube, LinkedIn, and Twitter** – for events, videos, interesting facts, calls for volunteers, and more. Subscribe, like, or join so you don't miss a post or upload.



Prefer email? [SSPforum.groups.io](https://sspforum.groups.io) is a simple, private email-based group, with no login required, replacing the old Yahoo group.

Every fall, **SSP Connect** pairs younger members with our newest alumni from the previous summer's program. They meet online to talk about college and life.

Member Relations Committee volunteers help staff plan activities such as the Annual Dinner, Open House Days on campus, Ask Me Anything sessions, SSP-logo swag, and affinity group travel. To get involved, email Katherine at khougland@ssp.org.

Community



At SSP '21, we built community with online talent shows ...

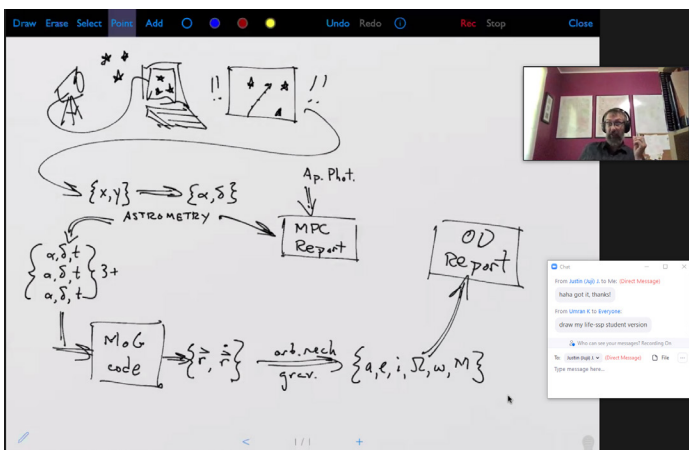
You can pay to take classes about astro or visit Open CourseWare. However, nothing can replace this community.

Out of all of the programs preaching community and inclusivity I have been part of, SSP has far and away done the best job of living up to those claims.



... online games ...

I just felt happy. The SSP community restored my faith in humanity, and gave me life in a million ways.



... and, of course, asteroid orbit determinations.

College Destinations SSP '20

Amherst College

Alex Y., Lexi O.

Baghdad City College

Fahmid R.

Brigham Young Univ.

Bryan H.

Brown Univ.

Ece E., Eric H., Thor C.

California Institute of Tech.

Alina Z., Kieran H., Sulekha K.

Case Western Reserve

Grace S.

Colorado College

Joshua M.

Columbia Univ.

Amy X., Hans S., Lucy C.,
Michelle A., Nick W.

Cornell Univ.

Mateo W., James R.

Duke Univ.

Ben P., Reed L. '19, Shelby C.

Fordham Univ.

Mary B., Ngan H.

Georgetown Univ.

Allison X.

Georgia Institute of Tech.

Arnav G., Stas K.

Harvard College

Linh V. '19, Kobe C.,
Yuen Ler C., Nino E.,
Nibrass F., Teresa L., Ben F.,
Bolu I., Angela L., Kelsey C.,
Cody C., Shwe W., Hannah Z.

Johns Hopkins Univ.

Brandon L., Jackson M.,
Jake M., Michelle S., Rahul J.

Korea Adv. Inst. of Sci. and Tech.

Clara H.

Lahore Univ. of Mgmt. Science

Maryam U.

Loyola Univ.

Rohan J.

McMaster Univ.

Nicolas T.

Massachusetts Institute of Tech.

Amelia S., Andrew S.,
Anika W., Anna L., Anna O.,
Bill W., Christina L. '19,
Cynthia C., Cynthia Q., Divya N.,
Ellie W., Emily Z., Fatima A.,
Feli X., Giuliana C., Isaac T.,
Jared M., Jenny B., Kai V., Karen L.,
Kelly W., Lily S., Lydia N., Maggie Y.,
Michelle Z., Miguel C., Naail L.,
Olivia H., Prajna N., Raphael C.,
Zimi Z.

New Mexico Institute of Tech.

Alex C.

Northeastern Univ.

Matt L.

Oklahoma State Univ.

Bogam G.

Oxford Univ.

Ela T., Lavender Y.,

Pomona College

Chris W., Larry L.

Princeton Univ.

Angela Z., Daphne H., Helen Z.,
Jaehee A., Jenny N., Krishna P.

Purdue Univ.

Fenry Z. '19

Reed College

Jeremy M.

Rice Univ.

David Z., Yuv S.

Rensselaer Polytechnic Inst.

Jacob F.

Stanford Univ.

Claire T., Daniel L., Esteban H.,
Jackson D., Jeremy T., Katie D.,
Laia B., Lexy T. '19, Michael T.,
Xitlali C.

Technical Univ. of Munich

Brendan M. '19

Texas A&M Univ.

David C.

Tufts Univ.

Cansu B., Helena L.

Univ. of California, Berkeley

Arjun G., Cooper J., Jonny P.,
Michelle D.

Univ. of California, San Diego

Diego S.

Univ. of California, Santa Barbara

David W.

Univ. of California, Los Angeles

Michael L.

Univ. of Chicago

Daniel G., Elena J.

Univ. of Illinois

Eric L.

Univ. of Pennsylvania

Ashna P., Ayanav R.,
Fiona L., Mariam J., Tian W.

Univ. of Rochester

Manuel G. '19

Univ. of Toronto

Amogh M.

Univ. of Virginia

Cole B., Lindsey B., Wilson Z.

Univ. of Washington

Jonathan S.

Univ. of Texas, Austin

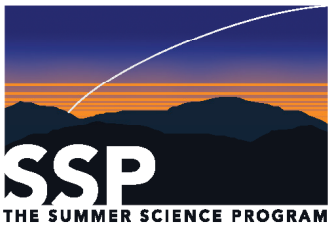
Anshita S., Rahul G.

Wellesley College

Alesya D.

Yale College

Aeka G., Anshul G., Aranyo R.,
Elena W., Jason P., Jess D.,
Neil H., Neil K. '19, Nicole V.,
Risha C., Will P.



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Cary, NC 27519

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Parents Say

SSP has the magic power to gather a group of STEM lovers to learn from one another, and inspire each other to become the best of themselves.

How does SSP inspire such passion? Every day, I had to remind Diran to eat.

I have never seen Emma work so hard, feel so exhausted and thrilled at the same time.

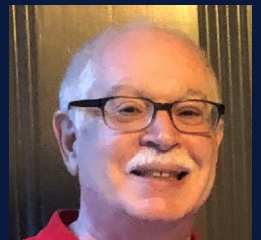
A truly remarkable, one-of-a-kind summer program!!!

Ayush is thrilled to be an alum now, and considers it an honor to be able to serve the community in the years to come.

”

Letter from the Chair

Dr. Ron Irving '68, Board Chair



During our second summer of online programs, SSP continued to thrive, providing participants with intellectual nourishment, a supportive community, and lasting memories. I am so proud of the SSP faculty and staff, who met the ongoing challenges of the pandemic with enthusiasm and grace. We will return to campuses in 2022 enriched by the experience, and ready for the rollout of our exciting new curriculum in genomics.

What next? A committee of board members and alums has been developing new statements of the Values, Vision, and Mission of our unique nonprofit, which you will soon have the opportunity to review. We look forward to your comments. The final versions will lay the foundation for a new strategic planning process, providing a roadmap as we continue to expand access to the transformational SSP experience.

Thank you for your support as together we build SSP's future.