

UNIVERSAL TIMES

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LINKS

Attend the Alumni Dinner on Nov. 14 at MIT Media Lab: ssp.org/dinner

Update your profile and find other SSPers: ssp.org/alumni

Donate securely to the 2016 Annual Fund: ssp.org/donate

Join the Facebook group (search for"SSP Alumni")

A Bigger, Better SSP

Two numbers tell the story. SSP's enrollment of gifted young people each summer has been capped at 72 for over a decade. Meanwhile, the number of applicants we turn away has soared to over 600 ... every spring.

That became an opportunity with the \$335,000 Expansion Planning Grant from the Gordon & Betty Moore Foundation. As we enter the third and final year of that grant, we now have in hand two excellent new student research projects and accompanying curricula: one in Biochemistry, the other in Metagenomics. Planning is underway to pilot the former at Purdue University next summer with six students. Read about the new project at ssp.org.

Deploying these exciting curricula starting in 2017 will require significant new funding, on the order of \$200,000 per campus per year. We will apply for appropriate grants from foundations, corporations, philanthropists, and the NSF. Contact us if you can help.



Students of SSP'15 at the campus observatory in Boulder

And more than just expansion is happening. A long-postponed website re-design is underway. Notice the updated logo above, and mission statement below. Sixteen years since leaving Thacher School, SSP is evolving and maturing into a more professional and sustainable non-profit – one that will still be inspiring students 57 years from now.

New Mission Statement Adopted

After several months of committee work, at its September meeting the Board of Trustees approved this new mission statement:

SSP's mission is to inspire exceptionally talented and motivated high school students to accelerate their intellectual and social development. Our college-level, residential program immerses students in a challenging science curriculum

with team-based, hands-on research to solve a central scientific problem. Since 1959, we have created a cultural environment of excellence, collaboration, and creativity, and we push our students beyond anything they have previously experienced. We measure our performance by the number of alumni who look back at SSP as a formative experience and support the program for future generations.



New Mexico Tech Campus

BY ADAM RENGSTORF, ACADEMIC DIRECTOR



t NM Tech this summer, AAD William Andersen, Site Director Leslie Clark, Programming Instructor Aaron Bauer '06, and TAs Mathis Habich, Elaine Johnson '05, Devin Whitten, and Linda Xu '10 joined me in leading our students through the successful completion of the Orbit Determination project.

Three of us delivered over 100 hours of lecture on all the mathematics, physics, astronomy, and computer programming necessary to obtain and reduce optical astronomical images, to perform astrometry and aperture photometry, to determine an asteroid's orbital elements via the method of Gauss, and to prepare those results for publication and presentation. With a prudent selection of six near-earth asteroids for observation, all converged to reasonable orbital elements.

Etscorn Observatory facilities are excellent, and the support we receive from Dan Klinglesmith is always superb. SSP had exclusive use of a C-14 telescope, SBIG ST-10 camera, and the main control room at Etscorn. Dan encouraged the TAs to call him any time of night, and happily obliged on more than one occasion. The dorm, classroom, computer labs and other Tech facilities were all excellent again this summer.

SSP is a belief that amazing things will happen when amazing people come together. It is an experience that gave me the inspiration to believe in science, good people, and exploring the unknown fearlessly.

- SUNAYANA RANE'15

An early and strong monsoon season this summer led to many cloudy nights. Eight teams collected enough data locally; four others needed a single observation taken remotely. All teams submitted their observations to the Minor Planet Center public archives. Over 47 lecture blocks, I lectured primarily on astronomy and cosmology; Dr. Andersen on calculus, physics, the OD, and quantum mechanics; Aaron Bauer on Python. We assigned shorter but more frequent homework assignments this summer, never two due on the same day and never on the day of a field trip.

The several students who did not already know calculus were among our hardest-working. They made valiant and successful efforts to complete the program, in some cases overtaking better prepared students. This group was by far the best writers I have seen in four summers with SSP. I had been planning on adding a lecture on scientific writing but deemed it unnecessary.

We took six off-campus trips, including Apache Point Observatory, the National Solar Observatory, and White Sands National Monument, to the Very Large Array, and to Magdalena Ridge Observatory. Add an afternoon in Santa Fe and an evening at the Magdalena Street Dance. Seven guest speakers addressed the group, including Dr. Nina Lanza on the Mars Curiosity Rover, and SSP Archivist John Briggs '76, who gave inspiring Closing Remarks.

In the last few days, our friends from Southwest Research Institute brought their SWIFT software again, allowing students to calculate the odds their asteroid will strike Earth, fall into the Sun, or be ejected from the solar system! The students appreciate this very appropriate postscript to their OD, as do I.

CU Boulder Campus

BY MARTIN MASON, ACADEMIC DIRECTOR



he Summer Science Program in Boulder was an unqualified success. We have proven that the core ingredients of the "secret sauce" are not a place or project, but people and culture.

A highlight of our new home is a spacious observatory, designed by Dr. Bruce Bohannan, inspired by his experience as a TA in Ojai over four summers. We had nightly access to a pair of professional-grade DFM telescopes on the roof, a 40-station computer lab, a classroom, and TA office. Naturally this building became the center of students' existence both day and night. The observatory is a short walk from both the dorm and the Center for Community dining hall, which featured an exemplary variety and quality of food.

Boulder is truly a center for space science. We visited the National Institute of Standards and Technology (NIST), home of the most accurate clocks in the world and the birthplace of WWV, that beeping shortwave station that is a fond memory of many alumni. At Lockheed Martin Space Systems Center, students interacted with real rocket scientists. At the National Center for Atmospheric Research (NCAR) they got to sit on a Cray supercomputer; the National Oceanic and Atmospheric Administration (NOAA) gave insight into weather tracking. Our own Dr. Tracy Furutani led a geology field trip to see rock outcroppings spanning 400 million years.

Tracy also joined Dr. Cassandra Fallscheer and me to teach asteroid centroiding, the least squares plate reduction, differential photometry, and of course orbit determination. We were ably assisted by a fine crew of TAs – mathematician Andrew Warren '10, physicist Reilly Raab '11, applied mathematician Isabella Sanders '12 and I entered the SSP ride alone, but came out with so many friends, with so much more confidence and determination, ready to take on any challenge that science and life bring.

- GRACE LAM '15

biophysicist Ioana Plesca '11. The TAs also arranged soccer matches and hikes, QODs and SOTS.

Students learned how to order food online, do laundry, and make their cash hold out. Site Director Joni Mauldin helped them with these life lessons. She also rushed students to the doctor, arranged for religious observances, and reassured worried parents at all hours of the night.

We are fortunate to have two alumni on the CU faculty: Planetarium director Douglas Duncan '69 and Physicist Michael Dubson '73. Both were always on call to overcome any obstacle. Doug led planetarium presentations and served as our Faculty Liaison. Mike led a tour of physics department teaching labs and a nighttime excursion to a dark sky site.

The guest speaker program included Larry Sverdrup performing his Mad Science show, Caltech professor Victor Tsai '98, biotech investor Matt Geller '64, and Nobel Laureate Eric Cornell among others.

I am profoundly grateful to the faculty and the extended SSP family who all pitched in to prove that the SSP experience can prosper in a new environment.

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Thank you for this summer, by far the best summer of my life. I learned a lot about not just science, but also myself, what I really love and the environment I thrive in. The faculty and students all put their whole being into the program.

- JULIA EDSPARR'15



COLLEGE DESTINATIONS OF '14ERS

AMHERST	Natalie Wigger
ARIZONA STATE UNIV	Olivia Larkin
BROWN	Saanya Jain
CALTECH	Daniel Assumpcao, Danny Park, Juliette Xiong, Luke Finnerty, May Chen, Zoey Flynn
CORNELL	Karen Perez, Nehal Rawat, Rachel Resnick
FRANKLIN AND MARSHALL COLLEGE	Han Le
HARVARD	Elba Alonso Monsalve, Linda Qin, Nisarga Paul, Richard Wang
HARVEY MUDD	Gavin Yancey, Luis Martinez
JOHNS HOPKINS	Anthony Flores
MIT	Alexandra Smerekanych, Ileana Rugina, Isaac Guerrero, Joshua Kim,
	Juan Carlos Garcia, Sawyer Hart, Shirley Lu
NM STATE UNIV.	Kevin Lee
NORTHWESTERN	Mark Berger
OXFORD	Joey Li
PENNSYLVANIA	Orhan Efe Yavuz, Sanjay Subramanian '13
POMONA	Jerry Xuan
PRINCETON	Alexandra Palocz, Christy Sue, Emily Abdo, Matthew Li, Tamri Macharashvili
RPI	Louis Hyde
STANFORD	Adam Stanford-Moore, Aditya Khandelwal, Andy Chen, Cameron Paige, Joan Creus,
	Jonathan Heckerman, Nancy Xu, Krsna Raniga, Kush Khosla, Paul Draghis, Zhanpei Fang
UC DAVIS	Sierra Chapman
UC SANTA BARBARA	David Rower
UNIV. OF ARIZONA	Scott McKinley
UNIV. OF CHICAGO	Jacob Pierce, QiQi Wang
UNIV. OF ILLINOIS	Albert Liu, Diana Kowalski
UNIV. OF MELBOURNE	Ammar Ahmed '13
YALE	Alex Chang, Chunny Ding, Gigi Stark, Hannah Almonte, Jessi Ambrosio, Julia Wei,
	Leroy Zhang, Minh Nguyen, Quinn Shepherd, Roland Huang, Tuna Uysal



The Summer Science Program Business Office: 108 Whiteberry Dr Cary, NC 27519 Address Service Requested



PRESIDENT'S LETTER

I completed my most challenging and rewarding assignment this summer since Team 9 charted 737 Arequipa back in 1978 -- defining what, exactly, SSP stands for. Check out the new SSP Mission Statement – I hope it resonates with you too.

Fulfilling this mission requires two things. First, keep delivering a great experience every summer. But, also – open that experience to more kids, in more places, in more fields of science. So we can change more lives.

To do this, we need your help. Your financial support is always appreciated of course, but also consider other forms of support:

- In a few months we expect to survey alumni and parents to better establish the impact SSP has had on its participants. The new Mission Statement asserts this, and our ability to convince foundations and corporations of SSP's value requires documenting what we take for granted. Please complete the survey when you get it.
- Enlarging our Admissions Committee in preparation for expansion. If you are an educator and can help review applications this winter, contact Richard Bowdon (rbowdon@ssp.org)
- Exploring institutional partnerships with Caltech, the Claremont colleges, Harvard, MIT, Stanford and Yale – SSP's top six schools. If you have a high level connection at one, I'd like to hear from you (mmckay@ssp.org).

My daughter is a college senior majoring in Biochemistry. When I described the new biochemistry pilot project, she said, "Dad, I wish this had been available when I was in high school, this is exactly what I would have wanted to do". I'm thrilled to be opening SSP to budding life scientists like Sarah.

Best, Mike McKay, SSP'78