The Summer Science Program

UNIVERSAL TIMES

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INSIDE THIS UT

MEMOS

- Next summer Dr. Tracy Furutani '79 has requested a sabbatical, so we have a senior faculty opening. And we're always looking for good teaching assistants. Pass the word and tell us (info@ssp.org) if you know any candidates.
- The annual fundraising drive will begin soon. Please remember SSP as you plan your year-end charitable donations.
- If this *UT* had to be forwarded to get to you (or whenever your email or postal address changes), tell us at www.summerscience.org/connect.

SOCORRO CAMPUS EXCEEDS EXPECTATIONS

BY DR. MARK HAMMERGREN, ACADEMIC DIRECTOR

The first-ever SSP outside of Ojai, on the campus of New Mexico Tech in Socorro, exceeded my expectations in almost every respect. The students were comparable to any I worked with in Ojai. All ten teams successfully completed their orbit determinations. In addition there was a delightful absence of significant personality conflicts, discipline issues, and injuries.

We owe big thanks to **Dr. Dan Klinglesmith** for setting up SSP's new dome, mount, astrograph, and guide scope. With this beautiful system we routinely reached 15th magnitude. Weather was not the problem we feared; the monsoon came late this year. Nonetheless, it took most of the program for all teams to get three good plates, usually due to poor focus or improper film loading. We had three measuring engines at our disposal, two refurbished for our use by **John Briggs** '76, and one owned by Tech.

We developed the films at the nearby Energetic Materials Research and Testing Center (EMRTC), enjoying our late-night visits with **Anita Cates** and her faithful dog **Sparky**.

Focusing our efforts on the astrograph, we made little use of Tech's Celestron C-14 and CCD camera. One night the mount lost its pointing model, putting it

(Continued on page 2)

Socorro Students & Faculty

MILESTONE REACHED IN OJAI PROGRAM

BY DR. TRACY FURUTANI '79, ACADEMIC DIRECTOR

I'm pleased to report another successful SSP in Ojai this past summer. All teams but one completed their orbital determinations. Beyond the basic O.D., most also generated an ephemeris for a fourth observation, and three compared the predicted and observed positions to check their computed orbital elements.

We reached a significant milestone: using observations from our digital Meade telescope interchangeably in the O.D. with analog observations. CCD image analysis was simple and effective using the software combination of The Sky and CCDSoft. Experienced teams could setup and point the telescope, focus the CCD camera, get an image, locate the asteroid and reference stars, and determine asteroid RA and declination, in under 90 minutes!

Some students took the initiative to use the Meade to obtain very nice color images of nebulae. In the future, acquiring a spectrograph for the Meade could open up the curriculum to that key application of quantum mechanics.

There were fewer problems with the UCLA astrograph than in recent years. Happy Valley School finished the dome structure, to everyone's relief. We tested un-

(Continued on page 2)

Ojai Students & Faculty

Orientation at SSP's new dome on the campus of Happy Valley School in Ojai

PARENTS SAY

"The program was a defining moment in my son's academic career. He's seen his academic future and it is good!"

—Janet Mattingly

"It was one of the first times Alex had felt truly responsible for something that was not really easy. That challenge, and the respect given to SSP participants, were meaningful to him."

—Nancy Taubenslag

"My son came home thrilled with all aspects of the experience. He felt like he 'belonged' more than he ever has anywhere else. "

—Carol Foote

SOCORRO ACADEMIC DIRECTOR'S REPORT *(continued from page 1)*

out of commission for the remainder of the program. Next summer I plan to institute systematic use of digital observations in the O.D.

For the first time in recent years, the students wrote their own plate solution programs from first principles. The students were also taught how to refine their asteroid's orbits using the process of differential correction. Five students attempted to perform the differential correction, and two were completely successful.

I lectured on astronomy, **Dr. Avon Russell** '89 on math & physics, and Resident Director **Robert Anderson** '73 on programming. Two class periods were devoted to TA lectures, and one to student lectures, as an innovation. They were uniformly well prepared and delivered. And, of course, the group enjoyed a dozen interesting guest speakers.

We were extremely fortunate to have an outstanding group of teaching assistants: **Elana Klein** '98, **Eric Deyo** '98, **Joe Bernstein**, and **Branwen Schuettpelz** '99. They really made the program their own.

We took a very long day trip to Apache Point Observatory / Sunspot Observatory where **Dr. Kurt Anderson** TA '62 showed off the 3.5 and 2.5-meter telescopes, and John Briggs led a tour of Sunspot. On shorter field trips we toured the Very Large Array and EMRTC (to witness a test explosion).

With no beach to go to on Wednesdays, we tried various alternative destinations, including a planetarium in Albuquerque, pueblo ruins, Elephant Butte Reservoir, and a few more. Most were worthwhile, but the reservoir was hot, stagnant, bright green, and ringed with dead fish – a real bonding experience! (Students did have access to a swimming pool on campus.) Next year we may hold lectures on Wednesday afternoon, freeing up all day Saturday for trips to places like Trinity Site and Los Alamos.

Our dormitory offered a convenient location and large rooms (with phones and sinks!). All of the lectures and labs were held a short block away. Our only complaint about the campus was the cafeteria food. Tech has promised to do better next year.

Overall there were fewer problems than I anticipated, and I look forward to next summer.

OJAI ACADEMIC DIRECTOR'S REPORT *(continued from page 1)*

hypered TMAX film (ASA 400) and found that its larger grain size did not interfere with getting precise asteroid positions. But many students again had trouble guiding accurately. Altogether only 28% of exposed films were measured. We have a couple of ideas to improve that next year.

Students this year seemed less prepared for computer programming than in years past, which delayed their O. D.'s. We only had about one working PC for every two students, not really enough, especially at crunch time.

We took field trips to JPL and Mt. Wilson Observatory. Of course, the Wednesday beach trips and Saturday movie nights are ever-popular. We also found a pool in town, open to the public on Saturdays.

Dr. Michael Faison joined us as Associate Academic Director to teach astronomy and direct the digital observations. He coordinated with Socorro Academic Director **Dr. Mark Hammergren**, on a parallax distance measurement of a Near-Earth Asteroid, which worked astoundingly well. Dr. Faison is planning a number of improvements for next year, including spectrographic analysis of stars.

In the new position of Resident Director, **Jaclyn Smith** handled discipline professionally and efficiently, taking a large burden off of the TAs. In addition, she coordinated field trips, guest speakers, and special meals.

Lead TA **Madison Compton** did an excellent job as always, conveying SSP's institutional culture to the new TA's. **Dan LaBrier** is not an alumnus, but quickly caught on. He was in high demand in the computer room as the O.D. programming reached its climax. **Victor Tsai** '98 lectured on all kinds of material, from atmospheric dynamics to game theory, and did the Questions of the Day, all with tireless enthusiasm. **Dana Ionita** '97's wide range of interests, from Black Sea archaeology to planetary nebula, attracted students to ask questions of her.

Many thanks to everyone on the SSP and HVS staffs for another successful program.

CONGRATULATIONS TO THE CLASS OF 2002!

Thirty SSP'ers from the Class of 2002 entered college this fall, along with four who were rising juniors at SSP 2001.

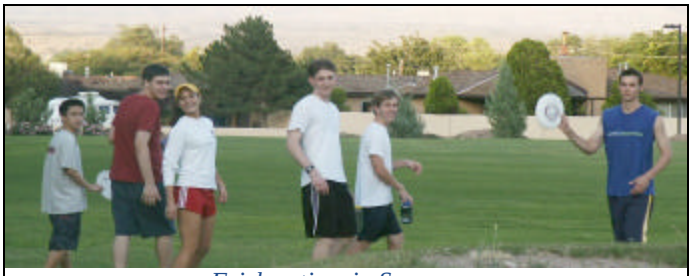
Melvin Makhni won the prize for most acceptances: 12, including Caltech, Princeton, Yale, Penn, and Duke. He turned those down in favor of MIT.

If you study or work at one of these institutions, look up a young SSP'er and invite him or her to lunch.

Visiting Jet Propulsion Lab

Hiking at Water Canyon Campground near Socorro.

Joshua Gottlieb '01	Harvard Univ.
Rohit Gupta '01	Cornell Univ. (early decision)
Matthew Jachowski '01	Stanford Univ. (early decision)
Nathan Kilbert '01	Yale Univ. (early decision)
Burak Altintas	Heidelberg Univ. Medical School
Greg Chanan	Stanford Univ. (early decision)
Evelyn Cheung	Caltech
Tracy Cheung	Stanford Univ.
Wook Choe	Yale Univ.
Ben DeLoache	Princeton Univ (early decision)
Laura DeMare	Johns Hopkins
Brianne Douthit	Colorado School of Mines
David Dow	Caltech
Rajiv Eranki	MIT
Kerry Eskenas	UC Berkeley
Ravi Gupta	Stanford Univ.
Erin Heyer	Harvey Mudd College
Yanna Kang	Univ. of Waterloo
Ashwin Krishnan	Duke Univ.
Melissa Latham	Duke Univ.
Alice Leung	Univ. of Waterloo
Teresa Liu	MIT
Melvin Makhni	MIT
Michael Mosley	Rose-Hulman Inst. of Tech.
Rachel Paterno-Mahler	Pomona College
Alex Phelps	Univ. of Sheffield
Anna Richardson	Dartmouth College
Ryan Sinnet	Caltech
Lupe Talavera	Cerritos College
Tom Tsai	Caltech
Chris Yim	MIT
Michelle Yong	UC Berkeley
Eunice Yu	Univ. of Michigan
Imran Zaidi	Queen's Univ.



Frisbee time in Socorro

THE UNIVERSAL TIMES

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The Ojai 2003 T-shirt design: "SSP = Super Special People"

PARENTS SAY

"Russell had what he said was the best six weeks of his entire life. The experience changed his attitude about school, college, and how he wants to live the rest of his life."

—Bruce Spitzer

"Some details of the program have changed over the years -- I tell my kids about the ancient mechanical calculators we had to use – but the heart of it has not."

—Mary Deyo '69, parent '98 and '03

"We were hesitant to send our son 7,000 miles away from home. But now we see that SSP is the best choice for a child of that age."

—Nasuhi Sonmez, Istanbul

Laura Grupp flies the "wing" as Dr. Paul MacCready and Tyler MacCready '79 look on.

2003'ERS SAY

"My time at SSP has allowed me to think better, stronger, faster, and harder than ever before."

—Alex Herring, Lake Oswego, Oregon

"SSP was the first time I saw what my true potential really was."

—Jason Hernandez, Gilbert, Arizona

"Never have I been with a group of people more fun and more interested in learning."

—Christine Deyo, Redmond, Washington

[these students attended the Socorro campus]

GUEST SPEAKERS STAR AGAIN

Ojai Campus	
Dr. Mark Green '63, UCLA	What Do Mathematicians Do All Day?
Dr. Tyrone B. Hayes, UC Berkeley	Hermaphrodites in the Cornfield
Dr. Kevin Iga '87, Pepperdine University	Polyhedra and Topology
Dr. Larry Sverdrup, Ophthonix, Inc.	Mad Science
Dr. Paul MacCready and Tyler MacCready '79, AeroVironment Inc.	Energy Conservation: Past, Present, and Future
Dr. Scott Pace '75, NASA	The New NASA Mission, Vision, and Strategic Plan
James "The Amazing" Randi, James Randi Educational Foundation	Search for the Chimera
Dr. Douglas Richstone '66, Univ. of Michigan	Finding Black Holes in the Centers of Galaxies
Dr. Thomas Steiman-Cameron FS '91-'92, NASA Ames Research Center	The Unseen Universe
Dr. Gregory A. Lyzenga, Harvey Mudd College	High Powered Rocketry for Fun and Learning
Dr. Lincoln Greenhill '79, Smithsonian Astrophysical Observatory	Brobdignagian Black Holes in the Centers of Galaxies
Dr. James Sloss, UC Santa Barbara	Sensors and Actuators (Closing)
Socorro Campus	
Dr. R. Paul Butler '77, Carnegie Inst. of Washington	Extrasolar Planets
Dr. Van Romero, New Mexico Institute of Mining and Technology	The Physics of Explosions
Dr. Fred Phillips, New Mexico Institute of Mining and Technology	Salt and the Rio Grande
Dr. Paul Gilna, Center for Human Genome Studies, Los Alamos National Laboratory	The Changing Face of Biology - the Legacy of the Genome Project
Dr. Penelope Boston, New Mexico Institute of Mining and Technology	Caves: Exploring Subterranean Life from Earth to Mars and Beyond
Dr. Larry Sverdrup, Ophthonix, Inc.	Mad Science
Dr. Jill Trewhella, Los Alamos National Laboratory	Challenges in Bioscience in the 21st Century
Dr. Joachim Rosenthal, Notre Dame Univ.	Cryptography and the Internet
Dr. David Westpfahl, New Mexico Institute of Mining and Technology	Introduction to Interferometry
Dr. Richard Aster, New Mexico Institute of Mining and Technology	Exploring the Earth with Seismology
Capt. Mary H. Miller '73, High Energy Laser Testing, US Navy	Closing Address

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I am enclosing my donation to the **only** independent science enrichment program managed and funded by its own alumni: ☐ **$500** ☐ **$250** ☐ **$100** ☐ **$50** ☐ **$25** **$**_____ ☐ please contact me

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REUNION DAY IN OJAI

If you've been to a reunion in Ojai, you know what to expect: interesting conversation, delicious food, a fascinating guest lecture, beautiful starry skies, and of course, victory over the students at softball.

Young alumni camp out in the Yurt on the HVS campus.

This year, perennial student favorite **Dr. Larry Sverdrup** delighted everyone with his "Mad Science" demonstrations, in his 16th SSP guest lecture. Afterward, **Denis Elliott** was recognized as the only holder of the "SSP Triple Crown": alumnus ('63), faculty (TA '69-'73), and parent (of **Abigail Elliott** '00).

Reunion Day dinner on the patio outside Zalk Theater.

"SSP DAY AT NEW MEXICO TECH"

June 28th went down in SSP history as New Mexico Tech President **Dr. Daniel Lopez** officially declared it to be "Summer Science Program Day". He joined the assembled students, faculty, Trustees, alumni, guests, and New Mexico Lt. Gov. **Diane Denish** to dedicate our new Takahashi FS-152 astrograph, in its own dome at Etscorn Observatory overlooking Tech campus.

Socorro Academic Director Dr. Mark Hammergren speaks at the ceremony.

After the ceremony and a buffet lunch, **Dr. Paul Gilna** — of the Center for Human Genome Studies at Los Alamos National Laboratory — lectured on "The Changing Face of Biology - the Legacy of the Genome Project". This was especially appropriate considering that Los Alamos National Lab is a major sponsor (along with Tech itself) of SSP's Socorro campus.

New Mexico Lt. Gov. Diane Denish cuts the ribbon to dedicate SSP's astrograph.

2003'ERS SAY

"It was definitely not what I expected, but it certainly was what I was looking for."

—Carmen Patrascu, Craiova, Romania

"You will never experience something so intense … in work and in play."

—Hossam Banaja, San Diego, California

"Eat, drink, and be merry, for tomorrow you go measuring for the first time."

—Paul Mandel, Soquel, California

[these students attended the Ojai campus]

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2003'ERS SAY

"Why can't school be like this?! Finally I'm doing real challenging work, not just busywork."

—Alex Early, Fresno, California (Ojai campus)

"SSP has by far exceeded my expectations … by how much? Infinitely."

—Anna Ly, Cherry Hill, New Jersey (Socorro campus)

CHAIRMAN'S LETTER

BY STEPHEN L. COTLER '60

When we took over operation of SSP from Thacher School in 1999, our first task was survival. We had to find a new site, raise money, and start a nonprofit corporation. That first summer we were scrambling. But ask any SSP2K'er if it was worth it. They rocked!

Over the next two years we built relationships, re-evaluated the curriculum, and updated the equipment, achieving a measure of organizational stability.

Some Things Never Change Dept.: "This is the astrograph given to us by UCLA."

For the young scientists who attended those programs, however, stability was furthest from their minds. They rocked!

This past year the task was growth. We assumed that cloning SSP would be a complicated project — and it was. But there were fewer glitches than we expected. And students at both campuses were upbeat, hardworking, and...simply put, they rocked!

I asked all our students last summer to commit to staying connected to SSP in three concrete ways. Now I ask the same of everyone reading this letter:

1) make certain we know your current postal and email addresses
2) make a contribution each year, even if only a small one
3) Pass on the word to any potential applicants you may know

The loyalty of alumni and friends make SSP unique in the educational world. Stay connected!

Dr. Tracy Furutani '79, the first alumnus to become Academic Director.