



The Summer Science Program

UNIVERSAL TIMES

March 2000

INSIDE THIS UT

<i>From the halls of NASA</i>	2
<i>Important Dates</i>	2
<i>Just like Ojai, maybe better?</i>	3
<i>Wanted: the Class of 2000</i>	4
<i>SSP '99'er is Intel Finalist</i>	4
<i>From SSP to STS</i>	4
<i>The CV Project</i>	insert

RE-CONNECT WITH SSP

- ? Fill out the enclosed CV Project form and return it
- ? Visit the Web site at www.summerscience.org, and subscribe to the alumni forum.
- ? Tell a local science or math teacher about SSP (and refer them to the website)
- ? Plan to visit Ojai during reunion weekend, Aug. 5
- ? Email us about how the SSP experience influenced you
<alumni@summerscience.org>
- ? Send a donation in the enclosed envelope

SSP 2000 IS A GO!

BY DR. TRACY FURUTANI '79, ACADEMIC DIRECTOR

Stepping out of the telescope dome on the hilltop at The Thacher School at night, many of you probably noticed a few lights almost directly across the Ojai Valley, on a bench of land known as the "Upper Ojai Valley". Those lights belong to the **Happy Valley School**, the campus of SSP 2000.

After 41 years at Thacher, and thanks to strong alumni support, SSP is moving to a new site. There will be a few changes, but not in our standards or mission. We will have Thacher's full cooperation, including access to the UCLA telescope. The academic focus of SSP will still be the classic problem: determine an asteroid's orbital elements from direct observations. This cannot be done with fewer than three observations (as you surely remember). In order to make sense of the observations, students need the math, physics and astronomy of celestial mechanics.

With this central goal in mind, here are a few of the changes and how we are compensating for them.

Due to scheduling conflicts, SSP 2000 cannot begin until July 26, a full month later than the starting date in previous years. Because most high schools start their fall semesters by Labor Day, we have shortened the program by one week, ending on August 30.

The challenge for us aca-

demically, then, is to condense the course material by a week without losing any significant topics. We are dealing with this in several ways:

- ? We will enroll only 24 students, which will allow every team to make enough observations in the time allotted. But we will keep the usual four TA's, for even more personal attention (and safe late-night driving back

(Continued on page 2)

APPROACHING PERIGEE

In the December letter to alumni, we announced a matching challenge grant from an anonymous alumna. It will double every dollar donated through April, up to \$100,000!

Her generosity inspired another matching challenge. If your employer does not match your SSP donation, the Holland Family Trust will, up to \$500 each. Since these, too, are matched by the first challenge, every \$1 you give now will turn into \$4. In effect, a quadruple match!

Your donation may never work this hard again. Don't miss this chance to help secure SSP's financial foundation. Even if your gift is small, please send it now; the breadth of alumni participation means a lot when we apply for grants.

BEYOND 2000: POSSIBILITIES FOR THE FUTURE

BY STEVE COTLER '60, CHAIRMAN, SUMMER SCIENCE PROGRAM, INC.

Here's a totally painless way for each alum to bolster SSP's future: just tell us who you turned out to be after that summer at SSP.

We alumni know the many ways in which SSP benefits its students. After four decades, SSP has a track record that cannot be matched by

any comparable applicant for grants. But to prove that to potential grant-givers and foundations, we need your help. Please complete the CV Project form on page 4 and mail it back. We will use it to prepare statistical summaries for our grant applications.

Philanthropic foundations are especially interested in programs which (a) can demonstrate success in terms of the desired outcomes and (b) have measurement systems to track performance. In short, how many SSP'ers earned a

(Continued on page 3)

SSP 2000 IS A GO!

(Continued from page 1)

and forth to Thacher).

? We will trim some optional topics and perhaps one guest speaker, while maintaining all of the celestial mechanics lectures and all of the "lead-in" lectures.

? We may use the Mount Wilson remote observing telescope to substitute for one of the three observations, or add a fourth. In this way, students can

also be exposed to wholly software-driven plate measurement and reduction methods.

? Happy Valley School has a different computer setup than Thacher, so we may need to make some minor adjustments to the programming methods, but the students will still learn basic programming skills.

So what else will **not** change about SSP? There will still be two senior fac-

ulty plus four TA's who will dedicate themselves to making the summer unforgettable. There will still be hot Ojai days, field trips to JPL and the beach, and plate exposures with star images that look like Saturn. There will still be learning about "rho-dot" as well as learning about how to live with a roommate.

How can you, as SSP alumni, help the academic aspect of the program? Simply put: offer to share your experience by being a guest speaker. No matter your current field (academic, business, clergy, homemaker, whatever), email me <tfurutani@summerscience.org> and let me know what topic you'd like to talk to 24 bright teenagers about.

Think about becoming a guest speaker ... and thanks for your support of SSP.

IMPORTANT DATES

April 15	"first-round" application deadline
May 8	matching challenge grant ends
July 26	students arrive in Ojai for 42 nd SSP
Aug. 5-6	reunion weekend
Aug. 30	last day of SSP 2000

Seen the new
Web site yet?
Take a look.

www.
summerscience.
org

FROM THE HALLS OF NASA

BY DR. JANICE BISHOP '81, UT SCIENCE ADVISOR

Cassini to Saturn

The spacecraft performed a flyby of the main belt asteroid 2685 Masursky on 1/23/2000. The opportunity was taken to test the camera and spectrometers measuring UV and visible/infrared radiation. Data was collected for a few hours before closest approach, when the Sun angle was optimal at a distance of 1.5 million kilometers. Cassini is due to arrive at Saturn in July, 2004. See <www.jpl.nasa.gov/cassini>

[SSP Inc. Director and Academic Director Emeritus, Dr. Stuart Stephens, is on

the Cassini team at JPL in Pasadena.—ed.]

Mars Missions

The recent failures of the Mars Climate Orbiter and Mars Polar Lander missions has caused NASA officials to begin rethinking how these missions are structured and perhaps make changes to upcoming missions.

Some hope was rekindled in January that the lander might be communicating when researchers at Stanford heard a faint signal at the right frequency. Radio-telescopes in the Nether-

lands and England joined in listening, but NASA has now concluded that the faint signal did not originate from Mars.

Mars Surveyor 2001 is scheduled to launch both an orbiter and a lander in 2001; however, this mission is currently under review and may incur payload and/or scheduling changes. See <mars.jpl.nasa.gov/2001/>

Martian Meteorites

Two rocks found 20 years ago near Los Angeles have recently been determined to be of Martian origin. These rocks have a fusion crust

(Continued on page 3)

BEYOND 2000

(Continued from page 1)

graduate degree, wrote a book, built a business, etc.?

With more institutional support, we can pursue several goals:

? Finding a permanent site

After 41 years under the Thacher School umbrella, an independent SSP will move to a temporary home this summer. But what about 2001 and beyond?

? Reaching out to minorities and young women

Grants would help us attract more applications from academically qualified students who might not otherwise hear of SSP, by funding scholarship contests and recruiting presentations across the nation.

? Enlarging the program

Should SSP be cloned? Several SSP's could run in different locations, benefiting more qualified students.

? Bringing in more guest speakers

...top corporate research or university personnel to give

a presentation, a lecture series, or even a short course on an appropriate topic.

? Putting together a greater array of field trips

SSP, unlike a "Space Camp", has never been a just recreational experience. Through a wider network of advisors and sponsors, we can make certain that the curriculum stays exciting and current.

? Creating better PR

National magazines write cover stories and Hollywood makes movies about near-Earth-objects and Mars with regularity. How is it possible that the long-

est-running summer science program is such a well-kept secret? We have a good story. Bolstered by statistics that underscore our successes, it will become a great story.

These are just a few of our ideas. Help make them happen; take a few minutes to fill out the form. And if you haven't already made a donation, please do so today. No amount is too small; the breadth of participation is as important as the total gift.

And remember: our matching challenge grant will expire very soon. Write to me at <scotler@summerscience.org>.

JUST LIKE OJAI ... MAYBE BETTER?

Help us broaden our choices of a site for SSP 2001. The ideal campus will have:

- ✓ a dark night sky
- ✓ housing, dining, lecture, and recreational facilities, removed from urban distractions, for 36 students plus staff
- ✓ availability from late June through early August
- ✓ personal computers and, optimally, a good astrograph
- ✓ access for guest speakers and nearby field trips (as JPL and Mt. Wilson are for Ojai).

Send your suggestions to Chuck Holland, Site Review Committee Chair <cholland@summerscience.org>.

Tuition pays only about a third of SSP's expenses. Alumni donations make up most of the rest.

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FROM THE HALLS OF NASA

(Continued from page 2)

characteristic of meteorites, and the Martian origin was determined from the D/H ratio and petrography (including maskelynite, a kind of shocked glass formed during impact). They have a similar composition to other Shergottite-type Martian meteorites.

For more information see these websites:

New meteorites: <www.msnbc.com/news/364529.asp?cp1=1>

Martian meteorites: <www-curator.jsc.nasa.gov/curator/antmet/mmc/mmc.htm>

WANTED: THE CLASS OF 2000

BY RICHARD BOWDON '74, COMMUNICATIONS CHAIRMAN

Naturally you noticed the new student recruiting brochure tucked into the envelope with your *Universal Times*. How could you miss it? We hope its eye-catching blue-and-orange "duotone" design will catch a lot of teenage eyeballs, too.

There are only 24 spots open this year, which doesn't sound like very many. But with this year's late ending date, many states are

effectively closed to us for recruiting (a situation we plan to fix in 2001).

A student doesn't just wake up one day and decide to apply to SSP. The brochure has to get her attention. That's its main job. If she is "SSP material", she'll want to check out the Web site. There she'll find our FAQ ("Frequently Asked Questions"), alumni testimonials from young and old (send

yours today), and complete application instructions (including downloadable forms).

But before any of that can happen, we have to **get the brochure to the prospective applicant in the first place**. That's where you come in. We can't buy a mailing list of interested, qualified students — it doesn't exist. The closest we can come is to send bro-

chures to science teachers, and to you, the alumni, who are always SSP's best salesmen and ambassadors.

Take a moment to think about who might benefit from SSP this summer. A nephew? A neighborhood kid? A younger sibling? A co-worker's teenager?

Pass on the brochure. Ask for more copies (<SSP-2000@summerscience.org>). If you don't know any potential applicants, call the science teachers at your local high school; they certainly will.

"I became acclimated to the routine of lectures, observing, and most importantly, sleep deprivation."

CLASS OF '99'ER IS INTEL FINALIST

Elizabeth Epstein '99, like all SSP students, learned how to calculate an asteroid's orbit ... but she didn't stop there. She went home and extended her SSP work, writing a paper and entering it in the 59th annual **Intel Science Talent Search** ("STS").

On January 24, she was named one of 40 national Finalists!

STS is America's oldest and most prestigious pre-college science competition, sometimes called the "Junior Nobel Prize." Its alumni include five Nobel Laureates, nine MacArthur Foundation Fellows, and two Fields Medalists.

Next stop for Elizabeth: the Science Talent Institute's black-tie awards on March 13 in Washington, D.C., where the top prize is a \$100,000 four-year scholarship.

FROM SSP TO STS

BY ELIZABETH EPSTEIN '99

A year ago I faced the daunting challenge of choosing the subject of my Senior Research Project, the culmination of my high school's curriculum. My uncle, Daniel Seligson (SSP '71) encouraged me to attend the Summer Science Program. I knew nothing about astronomy, but it sounded like a lot of fun. A few months later began my journey towards destiny, a.k.a. Ojai, California.

After a few (sidereal) days at SSP, I became acclimated to the routine of lectures, observing, and most importantly, sleep deprivation. My teammates and I cheerfully hiked up to the dome 16 times to observe the elusive Ausonia (setting the record for most plates taken). I finished writing my Orbit Determination program early, so the faculty challenged me to expand the program to incorporate four and five data points rather than the traditional three. It was a daunting task, but after a few hours and a few

Taylor Series, "The Determinator" worked perfectly.

Since my team barely had even three measurable plates, I borrowed two data points from the other team observing Ausonia. Unfortunately, the five observations were spaced unevenly in time, leading to large errors in the results. I was disappointed, but suddenly I had an idea for my senior project ... I would try to determine the exact effects of time spacing on the accuracy of orbital calculations! Later, back home in Maryland, I used observational data from the Minor Planet Center to (eventually) calculate more than 30,000 orbits for my project.

It turns out that the time between observations has a remarkably significant effect on the accuracy of the orbital elements. I entered my project, *Sensitivity of Gaussian Orbit Reduction to Time Spacing*, in the Intel Science Talent Search. I'm now preparing for the national Finals.

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