UNDERSTANDING THE “MAGIC IN THE BOTTLE”
WHAT IS SSP, EXACTLY?

It’s been called “the magic in the bottle” – the combination of curriculum, facilities, faculty, and sense of community that made SSP one of the longest-running and most successful summer enrichment programs in the nation. Six summers ago SSP moved across the Ojai Valley from Thacher School to Happy Valley School. It was an experiment: could the Thacher experience be transferred? It was a great success…so three summers ago we opened a second campus at New Mexico Tech in Socorro.

Our goal has been to change as little as possible, but inevitably SSP has evolved, as a result of moving, expanding, and simply with the changing times.

With that in mind, SSP’s Board of Trustees has launched a multi-pronged effort to understand thoroughly the essence of SSP, and to plan for the long term. They’ve started with three big questions, and formed a committee to answer each.

VALUES
What values, attitudes, and specific traditions make SSP a unique and rewarding experience for both students and staff? What essential ingredients created 40 years of stimulating intellectual and social atmosphere at Thacher School, and to what degree are they portable to other campuses?

The Values Committee is charged with documenting SSP values, culture, and traditions. Dr. Amy Barr ’94 (TA ’99, ’00, ’02) will chair, with members Mitch Kapor ’66, Henry Lichstein ’60, and Roger Klausler (administrative director ’82-’99). This committee anticipates asking for input from former staff, and reporting back to the Board at its meeting in February.

CURRICULUM
Eventually, SSP will have to transition to all-digital imaging, and leave film astro-

(Continued on page 2)
For the first time in her life, Mary was surrounded by her peers. She has quit saying ‘I’ll never get into MIT...’ She will move heaven and earth to get back in that environment -- it was home for the first time. She doesn’t do homework to get an ‘A’ anymore. Yesterday, she was driving the Bernoulli differential equations in her chemistry book just for fun. Thanks, SSP!

–John Masterman

“My daughter returned a more mature and confident young lady. Thanks for keeping programs such as this alive and well.”

—John E. Bishop, M.D.

WHAT IS SSP, EXACTLY? (continued from page 1)

Some Things Never Change Dept.: Using the Mt. Wilson measuring engine, once used by Edwin Hubble himself

PARENTS SAY

“For the first time in her life, Mary was surrounded by her peers. She has quit saying ‘I’ll never get into MIT...’ She will move heaven and earth to get back in that environment -- it was home for the first time. She doesn’t do homework to get an ‘A’ anymore. Yesterday, she was driving the Bernoulli differential equations in her chemistry book just for fun. Thanks, SSP!”

–John Masterman

“My daughter returned a more mature and confident young lady. Thanks for keeping programs such as this alive and well.”

—John E. Bishop, M.D.

The asteroid orbit determination project should:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Require collaboration in teams</td>
<td>higher</td>
</tr>
<tr>
<td>Collaboration is considered essential for most cutting edge research</td>
<td></td>
</tr>
<tr>
<td>Contribute to the body of scientific knowledge</td>
<td>lower</td>
</tr>
<tr>
<td>In contrast to a laboratory exercise for instructional purposes only</td>
<td></td>
</tr>
<tr>
<td>Involve real-life “messiness” and ambiguity</td>
<td>higher</td>
</tr>
<tr>
<td>In contrast to a canned textbook exercise that lacks uncertainties</td>
<td></td>
</tr>
<tr>
<td>Utilize techniques and instrumentation in use by scientists today</td>
<td>lower</td>
</tr>
<tr>
<td>In contrast to obsolete techniques and instrumentation</td>
<td></td>
</tr>
<tr>
<td>Use the scientific method to work through a problem from start to finish</td>
<td>lower</td>
</tr>
<tr>
<td>including hypothesis generation, data collection, reduction, and analysis,</td>
<td></td>
</tr>
<tr>
<td>producing a quantitative result that is compared with a predicted result</td>
<td></td>
</tr>
<tr>
<td>Involve hands-on (possibly “hands-dirty”) experimental work</td>
<td>higher</td>
</tr>
<tr>
<td>Be challenging but also achievable by intense focus</td>
<td>higher</td>
</tr>
<tr>
<td>Given the typical skills and experience of the target SSP students</td>
<td></td>
</tr>
<tr>
<td>Require students to acquire new skills and knowledge</td>
<td>higher</td>
</tr>
<tr>
<td>E.g., applied math, physics, astronomy, and computer programming</td>
<td></td>
</tr>
<tr>
<td>Utilize equipment and supplies that are available, affordable and supportable</td>
<td>higher</td>
</tr>
<tr>
<td>Be appealing and attractive to teaching faculty</td>
<td>higher</td>
</tr>
</tbody>
</table>
“Many thanks for Masha’s happy and inspired face when we met her at the Boston airport after SSP. What seemed impossible considering the workload, late night study, and all-night observations was her confident, relaxed, and healthy appearance. Masha still has that ‘airport’ expression on her face when she talks about SSP.”

—Lera Baru and Igor Baryakhtar

Class of 2004 Colleges

Amherst: Jonathan Tucker
Cal Poly SLO: Francesca Lettang
Caltech: Rico Chiu, Jason Hernandez, Brian Sampson
Carnegie Mellon: Richard Halstead
Case Western: Kate Oldak
Chicago: Emma Lipari
College of DuPage: Michael Pogwizd
Columbia: Marshall Fox, Chris Haueter
Hampshire: Matthew Ragins
Harvard: Bethania Bacigalupe, Min Hwang, Christina Li, Ariadne Medler, Godelievre Ndunduyenge
Harvey Mudd: Camilo Brokaw, Mary Bush, Michael VanAntwerp
Johns Hopkins: Mireille Gomez
Kenyon: Tova Yoast-Hull
Lewis & Clark: Jeanine Fallen Bailey
MIT: Grace Cheung, Shuo Han, Robert Haussman, Suzanna Megyery, Vladimir Rosenhaus, Yunus Sasmaz, Jyotsna Venkataramanan, Lisa Wang, Helen You
Olin College of Eng.: Paul Mandel
Pennsylvania: Alex Herring
Pomona: Erik Kuefler, Irene Toro Martinez
Princeton: Nicole Clarke, Arthur Ewenczuk
RPI: Eric Wilson, Mike Zuser
Rutgers: Nick Reed
St. John’s College: Kevin Andrus
Stanford: Joshua Chang, Josh Dillon, Lawson Wong
Swarthmore: Eric Astor
UC Berkeley: Jack Chai, Kevin Liu, Jimmy Tang
UC Santa Cruz: Vickie Martin
UCLA: Krystle Remmen
Univ of Craiova: Cristina Nitu
Univ of the Pacific: Adam Van Antwerp
USC: Sonya Hanson, Benedikt Riedel
Wellesley: Mary French, Christina Kim
Yale: Firat Erel, Daniel Marks, Erin Miller, Dilaver Velioglu

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Outside Driscoll Hall, SSP’s dorm at New Mexico Tech

Our dome at Etscorn Observatory with new control center.

“The best summer I’ve ever had.”
—Patrick Holvey

“I learned how to pick two out of sleep, study, and social life.”
—Masha Baryakhtar

“SSP rocks my socks.”
—Laura Chanan
Why was SSP so great? Simply put, for the first time Robert found himself with a group of peers who were highly intellectual and learning for the sake of pure knowledge, not for grades or accolades. He loved studying the principles of calculus and astrophysics during the day . . . and then putting them to use in a real-life observatory.

The instruction was top-notch, and the students also had plenty of fun. Robert came home literally gushing with excitement about college.

—Andrew P. Corty

**Ojai Campus**

- Dr. Paul Pottinger, Univ. of Washington: "The Science of Malaria"
- Dr. David Israel, SRI AI Center: "The Very Idea of a Computer"
- Dr. Julian Krolik ’66, Johns Hopkins: "How Black Holes Shine"
- Dr. Larry Sverdrup, Ophthonix, Inc.: "Mad? Science"
- Dr. Claudia Alexander, Jet Propulsion Lab.: "Looking at Comets Up Close & Personal with the International Rosetta Mission"
- Dr. Jerry Nelson ’60, UC Santa Cruz: "Segmented Mirror Telescopes, from Keck to TMT"

**Socorro Campus**

- Dr. Fran Bagenal, Univ. of Colorado: "The New Horizons mission to Pluto"
- Dr. Paul Pottinger, Univ. of Washington: "The Science of Malaria"
- Dr. Janice Bishop ’81, TA ’86-’87, SETI Institute and NASA-Ames Research Center: "Looking at Mars through a CRISM"
- Dr. Uma Krishnamoorthy, Sandia National Lab.: "Micro-Electro-Mechanical Systems"
- Dr. Galen Gisler, Los Alamos National Lab: "Calculations of the Asteroid Impact at Chicxulub at the End of the Cretaceous"
- Dr. Gregory A. Lyzenga, Harvey Mudd College: "High Powered Rocketry for Fun and Learning"
- Benjamin K. Roe, National Public Radio: "Claiming the Public Space: Public Radio in the Digital Media Age"
- Dr. Louise Prockter, Johns Hopkins Applied Physics Laboratory: "The Messenger Mission to Mercury (It's not the humidity, it's the heat!)"
- Dr. Penelope Boston, NM Tech: "Caves from Earth to Mars and Beyond"
- James Randi, James Randi Educational Fdn.: "Search for the Chimera"
- Kjerstin Williams, Caltech: "Swarming Robots"
- Dr. Larry Sverdrup, Ophthonix, Inc.: "Mad? Science"
- John Briggs ’76, Phillips Academy: Closing Address
I am enclosing my donation to the only independent science enrichment program managed and funded by its own alumni:  

☐ $1000  ☐ $500  ☐ $250  ☐ $100  ☐ $50  ☐ $25  ☐ $_______

Credit to (name) __________________________  ☐ Alum  ☐ Parent  ☐ Faculty  ☐ Friend

My email address: _________________________________________________________________

Earmark my donation for: ☐ Unrestricted  ☐ Abell Scholarship

My employer will match my gift  Employer: ___________________  (enclose matching gift forms)

Return this form to
Summer Science Program
c/o Henry Lichstein
544 Dryad Rd
Santa Monica, CA 90402.

Summer Science Program, Inc. is designated a 501c(3) nonprofit corporation by the Internal Revenue Service. Donations are tax-deductible according to law.

REPORT ON SSP 2005 (continued from back page)

In Socorro, the faculty persevered through various problems including cloudy weather, low motivation of some of the students, and the early departure of the Residential Director (replaced on short notice by Joe Bernstein TA '03, who flew out from Harvard for two weeks of what we called "a little working vacation"). Everyone appreciated the improvements to "our" dome at Etscorn Observatory at NM Tech [see photo on p. 3]. The Socorro group again took field trips to the Very Large Array and White Sands Missile Range. This summer for the first time, they also made the long drive to Los Alamos National Lab for a behind-the-scenes tour. LANL has supported the Socorro campus with financial support and guest speakers since 2003. This year LANL also gave five full scholarships to New Mexican residents. Thanks are also due to Sandia National Labs for doubling their support this year, and to Tech staff for their consistent support.

Comments written by the students from both campuses (some quoted in this UT) indicated that, as usual, the vast majority very much appreciated and benefited from SSP 2005.

2005ERS SAY

“The life change per day rate was higher than I ever imagined it could be. Thank you, you have profoundly affected my life for the better.”

–Matt Bowes

“The people here are truly amazing. It feels like I’ve known them way longer than six weeks, and simultaneously as if I should be here six weeks longer.”

–Anna deBakker

“… the epitome of camaraderie”

–Allen Yu
The faculty of the 47th Summer Science Program delivered the customary “educational experience of a lifetime” to some of the world’s most promising young scientists, despite a number of challenges.

In Ojai, the venerable UCLA astrograph and mount suffered its usual quota of mechanical problems. Nevertheless, thanks to the persistence and ingenuity of the faculty, students’ guiding success rate was the highest it has been for at least a decade. Digital images from the Meade telescope / SBIG CCD camera were fully integrated into the OD project. All of the students completed their orbital determinations, used the f and g series calculations to check their solar and asteroid vectors, and generated an ephemeris to check their orbital elements. A third of the students added a light travel time correction.

The Ojai group made its annual field trip to Jet Propulsion Lab, but this year substituted JPL’s Table Mountain Observatory for Mt. Wilson, and added a trip to Caltech campus where they were feted by administrators and visited labs.

(Continued on page 7)