



Vol. 23

The Summer Science Program

UNIVERSAL TIMES

October 2004

INSIDE THIS UT

Class of 2003 3
Colleges

Donors & 4-5
Volunteers

Guest Speakers 6

Reunion Day 7

Donation form 7

Chairman's 8
Letter

MEMOS

- Please remember SSP as you plan your year-end charitable donations. Mail in the form on page 7, or visit www.ssp.org/donate to use a credit or debit card.
- Whenever your email or postal address changes, tell us at www.ssp.org/connect.
- Special thanks are due to **Research Systems, Inc.** (www.rsinc.com) for the IDL programming language, and **Software Bisque** (www.bisque.com) for The Sky software, and CCDSoft to run the digital telescope in Ojai!
- Mark your calendar now for 2005 Reunion Day: **July 9** in Socorro, **July 16** in Ojai.

SOPHOMORE YEAR SUCCESS IN SOCORRO

BY DR. MARK HAMMERGREN, ACADEMIC DIRECTOR

I am pleased to report that in the second year of SSP / Socorro, all 36 students successfully completed their orbit determinations. Students obtained 31 measurable films; teams borrowed a third film as necessary. Unfortunately, the weather was more typical this year: local "monsoon season" hit by the fifth week of the program.

Although I investigated and described in class the use of Gaussian orbit determination, I ended up teaching the "regular" Laplacian method used in recent years at SSP. The main reason I did not further pursue Gauss's method is that I have not yet

found any decent, full derivations of the method.

For the first scientific field trip, to the Very Large Array, **Dave Finley** of the National Radio Astronomy Observatory gave us a guided tour of one of the dishes and the control center. In the last week, US Navy **Capt. Mary Miller '73** organized SSP's first-ever overnight field trip, to White Sands Missile Range. We visited Trinity Site, High Energy Laser Systems Test Facility, Missile

Park, and the Control Center. We had dinner at the Officers' Club and slept in the gym. The next morning started with an early morning rocket launch, then we continued to Apache Point Observatory where the D-

(Continued on page 2)



Socorro Students

OUTSTANDING OUTCOME IN OJAI

BY DR. RAN SIVRON, ACADEMIC DIRECTOR

The 46th Summer Science Program in Ojai turned out to be extremely successful. All 12 teams completed the asteroid orbit determination with software they wrote in the IDL language, and used the f and g series calculations to check their orbits.

We overcame some difficult challenges. I was new to SSP, and **Gary Horne** was returning as Associate Academic Director for the first time since 1998. Just before arrival, Gary broke the thumb on his writing hand. We covered for him by drafting **Dr. Tracy Furutani '79** (officially on sabbatical) to cover the first

two weeks of math lectures. Minor problems with the astrograph mount made it difficult for students to guide successfully. Two full moons in July didn't help.

For the first time, we used unhypered Tmax film, without sacrificing accuracy. On many nights, students used the Meade / CCD telescope for direct viewing of various planets, asteroids, nebulae, and star clusters.

Gary and I

introduced error analysis into the OD, which ten students completed. We also added linear algebra and probability to the curriculum. I lectured on the boomerang as a demonstration of precession, and physics of black holes.

(Continued on page 2)



Ojai Students & Teaching Assistants



Ojai Assoc. Academic Director Gary Horne greets arriving students with his broken thumb.

PARENTS SAY

"Becky had such a great experience that she could not stop raving about it."

—Chuck K. Chan

"Teresa has never felt such a bond with a group of students before. The thought of never again having the same 'meeting of the minds' made her cry buckets of tears when she left Ojai."

—Grace Van Diest

"Erik will use this experience to give him confidence in the next big transition, heading out of state to college. I have seen his sense of responsibility increase dramatically this summer."

—Nancy Kuefler

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

rector, **Bruce Gillespie**, hosted us for a special viewing of the 2.5-meter Sloan Digital Sky Survey telescope. It was a fantastic trip, but a real marathon.

On other days, we visited the Museum of Natural History in Albuquerque, Energetic Materials Research and Testing Center in Socorro, the Old Timers' Reunion in Magdalena, the ruins at Abo and Gran Quivira, and Albuquerque's "Old Town" tourist area. The town of Socorro is within walking distance for weekend shopping.

We used golf carts for nightly transportation to the observatory and darkroom. Our Takahashi astrograph continued to perform very well, both optically and mechanically.

We were usually able to reach about 15th magnitude in clear skies by using unhypered Tmax 400 speed film. **John Briggs '76** again supplied both measuring engines. We're thrilled that John has started a new job at Tech's Magdalena Ridge Observatory.

These talented individuals joined me on the staff: **Dr. David Winch** (Associate Academic Director) taught physics and math. At one point he split the class into teams to produce 15-minute presentations on topics of their choice in physics. **Donna Mong** (Residential Counselor) brought experience dealing with teenagers in a residential school setting, and acted as our primary liaison with the Tech administration. **Branwen Schuettelpelz '99** was an out-

standing Lead TA and made this group the most functional and friendly I have ever known. **Sam Arons '99** and **Lissa Ong '99** were driven to give the students the best possible experience at SSP, in every respect. They both gave a TA lecture: Lissa on Jupiter's icy moon Europa, and Sam on a proposed wind farm. **Phil Oakley**, although not an alumnus, enthusiastically embraced the academic and social culture of SSP.

Finally I also want to thank everyone at New Mexico Tech, but especially **Dr. Dan Klinglesmith** for his essential assistance with everything at Etschorn Observatory, and **Laurie Tenison** of Residential Life for her help with every other aspect of life at Tech.

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

Several of the guest speakers stuck around to do more. Notably, **Dr. Greg Lyzenga** engaged students in observing an asteroid transit, and **Van Snyder '63** inspired 12 students to witness, from campus, the pre-dawn launch of the Aura satellite at Vandenberg. Following long tradition we visited Jet Propulsion Lab (hosted by **Dr. Stuart Stephens**), Mt. Wilson Observatory, and area beaches.

We couldn't have done it without Residential Counselor **Jackie Smith**, who professionally and efficiently handled student behavior issues (such as sleeping in lecture), and logistics of field trips and guest speakers. She also dealt with health problems including a case of mononucleosis and two twisted ankles.

The four TA's did a great job. In addition to all of their routine duties, each found a unique role. Lead TA **Victor Tsai '99** showed tireless enthusiasm, organizing the observation schedule, proper motion corrections, measuring, and QOD assignments. **Tuan Do** brought much-needed experience with the IDL programming language. He and Victor gave the programming lectures and tutorials, and thanks to them, student OD programs were especially well-written this year. **Tiffany Titus '99** graded most of the HW assignments, and helped resolve issues in the girl's dorm. **Justin Kao '00** organized sports tournaments, dances, games, and movies. (Justin, by the way, is the first post-Thacher alumnus to return as a TA.)

Last but not least, **Mike Ad-**

ams, Juana Juarez, and the rest of the staff at Happy Valley School went to extra efforts for us, and we can't thank them enough.

In summary, I personally had a sense of accomplishment, and great joy from my interaction with the students. They entered the last week with a lot of energy, and finished on an emotional "high", the result of the 24/7 support provided by our terrific staff. Everyone felt a sense of togetherness and professionalism, reflected in their eagerness to keep in touch after leaving Ojai.

[Editor's note: Dr. Sivron's wife Nava and daughter Carmel accompanied him to Ojai. Only weeks after returning home, Nava died of breast cancer. Everyone who knew her will remember her wonderful spirit.]

CONGRATULATIONS TO THE CLASS OF 2003!

The colleges enrolling 52 SSP'ers from the Class of '03 (plus four from '02) reads like one of those "best in the world" lists.

Pat Milhelich '02 (Stanford) and **Yvonne Yamanaka '03** (Duke) each scored 11 acceptances (and turned down the college the other chose). Between them they also received offers from Yale, MIT, Caltech, Princeton, Rice, Cornell, Univ. of Chicago, and several others.



Dr. Sivron hands out the first homework assignment!



Trinity Site at White Sands Missile Range

THE UNIVERSAL TIMES

Published by Summer Science Program, Inc.

Business Office:

108 Whiteberry Dr
Cary, NC 27519

Richard D. Bowdon '74,
Executive Director

Email

info@summerscience.org

Voicemail 866.728.0999

Website

www.summerscience.org

Boston Univ.	Lisa Wang
Brigham Young	Nathaniel Major
Brown	Janaki Kibe, Alex Rosenthal, Aaron Eisman
Cal Poly-Pomona	Alan Duran
Caltech	Jared Hudgins. Sean Mattingly
Carnegie Mellon	Anna Ly
Columbia	Ahmet Kizilay, Russell Spitzer
Cornell	Melissa Horowitz, Jaret Lee
Duke	Simon Kwak, Yvonne Yamanaka
Florida Intl. Univ.	Raul Chinga
Harvard	Andrei Munteanu '02
Harvey Mudd	Karen Brown '02, Hyung-Joo Park
Johns Hopkins	Mireille Gomez
Lafayette College	Derya Meral
MIT	Pawan Deedwaniya, Lydia Gu, Anthony Jones, Austin Oehlerking, Bob Zhao
Olin College of Engr.	Hossam Banaja
Princeton	Peter Combs, Yufei Liu, April Frieda
Reed College	Christine Deyo
Rensselaer Polytechnic Institute	Kyle Crawford
Scripps College	Sofia Salazar
Southern Methodist	Chris Christensen
Stanford	Patrick Mihelich '02, Frederick Wulff '02, Eloy Ivan Balderas, Huong Thai, Roseanne Warren
SUNY Buffalo	Michelle Dietz
Texas A&M	Jose Rodriguez
UC Berkeley	Alex Early, Anne Narayan
UC San Diego	Sara Thoi
Univ. of Chicago	Susie Kim, Annelise Pitts
Univ. of New Mexico	Amanda Townsend
Univ. of Penn.	Jeffrey Lawi
Univ. of Washington	Laura Grupp
USMA - West Point	Jeffery Taylor
Vassar	Reese Isaacson, Ana Popovska
Yale	Kristen-Elise Brooks, Gabe Billings, Eve Burstein, Yigit Dula



Touring the Very Large Array outside of Socorro.



Ojai Lead TA Victor Tsai '98 with two of his pet walruses

2004'ERS SAY

"SSP is more than academics. Friendship, solidarity, and trust in each other are what make me be proud to be an alumnus."

—Firat Erel, Istanbul

"This experience has had an indescribably awesome impact on me."

—Nicole Clark, Baltimore

"I learned that you can be really smart but cool at the same time!"

—Teresa Van Diest, Palmer, Alaska

"By the end I was so tired that orbital determination actually seemed fun."

—Brian Sampson, Carlotta, California



*Ojai Class Beverage:
Starbucks Frappuccino.*

2004'ERS SAY

*"It's a world where
science is cool."*

—Jameson Neff,
Bothell, Washington

*An experience like
SSP cannot be put
into words. It's
exhilarating,
exhausting,
emotionally uplifting
and simple
incredible ... the most
amazing six weeks of
my life."*

—Ariadne Medler,
Kealahou, Hawaii

*"You're in another
universe for six
weeks -- where you
learn about everything
about life."*

—Helen You,
Chelmsford, Mass.

GUEST SPEAKERS STAR AGAIN

Ojai Campus

Dr. Gregory A. Lyzenga, Prof. of Physics, Harvey Mudd College: "High Powered Rocketry for Fun and Learning"

Dr. Christopher Wyman '94, Asst. Prof., Univ. of Iowa: "Computer Graphics from a Researcher's Point of View"

Dr. Anthony Newman, Instr. of Philosophy, Tufts Univ.: "Philosophical Perplexities in Empirical Science"

James Randi, Founder, James Randi Educational Foundation: "Search for the Chimera"

Dr. Charles Zender '81, Prof. of Earth System Science, UC Irvine: "The Atmospheric Physics of Climate Change"

Dr. Jay M. Pasachoff, Prof. of Astronomy, Williams College: "Eclipses, Occultations, and the Transit of Venus"

Dr. R. Paul Butler '77, Staff Scientist, Carnegie Inst. of Washington: "Extrasolar Planets"

W. Van Snyder '63, Mathematician, Jet Propulsion Lab: "Satellite Remote Sensing"

Dr. Scott Pace '75, Chief Technologist for Space Communications, NASA: "The Vision for Space Exploration"

Dr. Larry Sverdrup, Senior Scientist, Optronix, Inc.: "Mad? Science"

Roland Allen, Dir. of College Counseling, St. Margaret's Episcopal School : Closing Address

Socorro Campus

Dr. Galen Gisler, Researcher, Los Alamos National Labs: "Simulating Asteroid Impacts"

Shiloh Sison, PhD Student / Design Engineer, UC Davis / Analog Devices: "Seeing Inside the Body: the Physics of Medical Imaging"

Dr. Larry Sverdrup, Senior Scientist, Optronix, Inc.: "Mad? Science"

Dr. Philip D. Nicholson, Prof. of Astronomy, Cornell Univ.: "Recent Discoveries of Planetary Satellites: 138 and Counting..."

James Randi, Founder, James Randi Educational Foundation: "Search for the Chimera"

John Briggs '76, Magdalena Ridge Observatory: "Antarctic Odyssey: Winter-Over at South Pole Station"

Dr. Van Romero, VP, Research, New Mexico Tech: "The Physics of Explosions"

Dr. Paul Pottinger, Sr Fellow, Allergy & Infectious Diseases, Univ. of Washington: "The Science and Conquest of Malaria"

Dr. Eileen V. Ryan, Project Scientist, Magdalena Ridge Observatory: "Collisional History of the Vesta Family of Asteroids"

Dr. Penelope Boston, Director, Cave and Karst Studies, New Mexico Tech: "Caves from Earth to Mars and Beyond"

Dr. Terry C. Lowe, Program Manager, Los Alamos National Labs: 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) _____ Year _____ ☐ 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 with your check, payable to **Summer Science Program, Inc., c/o Henry Lichstein, 544 Dryad Rd, Santa Monica, CA 90402**. Please correct your name and address, if necessary, on the back, or using the online form at www.summerscience.org/connect. Thank you!

It's also safe and easy to donate on-line, using a credit or debit card, at www.summerscience.org/donate. Summer Science Program, Inc. is designated a 501c(3) nonprofit corporation by the Internal Revenue Service. Donations are tax-deductible according to law.

REUNION DAY IN OJAI

Over 50 alumni and their families joined students and faculty for Reunion Day fun, food, and festivities, coordinated by **Adam Thodey '91**. The Class of '94 made an especially strong showing for their 10th Reunion.

At the alumni vs. students softball game, **Steve Cotler '60** hit a three-run triple, on the way to a lopsided 20-3 victory. The students remembered this later in their

class T-shirt design: "You know you're at SSP ... when students can't beat 60-year-olds at softball."

After a delicious outdoor buffet dinner, featured speaker **James Randi** described his work as the nemesis of all forms of pseudoscience, spicing his presentation with magic tricks. He had given a presentation to the Socorro campus just the day before.



Students huddle before the softball game vs. alumni. They also painted their faces. It didn't work.

CHAIRMAN'S LETTER (continued from back page)

classic research project in astrometry has stood the test of time.

These files contain dozens of letters (onionskin carbons...who remembers those?), brochures for each

year, photographs, and applications from every student who ever attended. Think of it, alumni: we have, in your handwriting, the essays you wrote and the answers you gave.

In our second post-expansion summer, 72 SSP'ers from 22 states and 7 foreign countries learned a lot of physics and math, had fun, and stayed up very, very late to complete their ODs. They also matured, gained self-confidence, and built friendships that will last a lifetime.

Alumni and friends are key to SSP's continued success. We are an alumni-run, alumni-supported organization. SSP's new fiscal year has just started — don't forget to make a donation!



Future rocket scientists at Missile Park, WSMR



Field trip to the planetarium in Albuquerque.

2004'ERS SAY

"I have made the best friends I could ever make, and have found out that my true career does indeed lie in science. Thank you!!"

—Jyotsna Venkataramanan, Mexico City

"SSP became who we are, and we became SSP."

—Shuo Han, Diamond Bar, California

"I have grown and matured. This program has taught me to believe, work hard, and achieve."

—Jen Loong, Richmond, British Columbia



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

Address Service Requested

2004'ERS SAY

*"Now I understand
why the alumni care
so deeply about
the program."*

—Min Hwang,
Lima, Peru

*"SSP has changed
my life. (Yes! The
cliché phrase!) There
is no way I'll look at
my life in the same
way I did before.
Simply knowing that
people like this exist
is amazing."*

—Irene Martinez,
St. Paul, Minn.

CHAIRMAN'S LETTER

BY STEPHEN L. COTLER '60

This past summer we received an unexpected gift from Thacher School: ten linear feet of files, telling the story of SSP's history through the handoff to alumni in 1999. The first document is dated just 18 days after Sputnik was launched in October, 1957. It is a letter from Newton Chase, Headmaster of Thacher, to Wallace Sterling, then President of Stan-

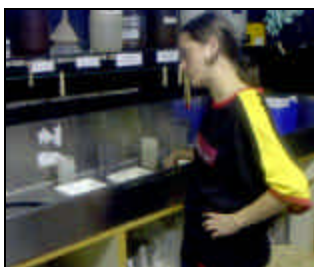
ford. In essence the letter says, "Dear Wally, I have this really great idea...."

Over the next year, Chase found more support from Caltech, Pomona College, and Harvey Mudd. Caltech agreed to operate the program and asked its Freshman Dean Foster Strong and Pomona's Prof. Paul Routly to teach. The tuition was set at \$200.

Their original idea was simply to teach college-level physics and math. When satellite manufacturer Hughes Aircraft got involved (Howard Hughes was a Thacher alumnus), the curriculum switched to satellite observation. Students would be given an orbit, then asked to find the satellite and photograph it.

But Prof. Routly had an even better idea. Just weeks before the Class of 1959 arrived at Thacher, he convinced the Executive Committee (chaired by Caltech Prof. Richard Sutton) that the inverse -- derive the orbit from the observations -- would be more intellectually and pedagogically appropriate. He was right, and that

(Continued on page 7)



*Some Things Never Change
Dept.: the darkroom in Ojai*



*Team 7 has a little fun up
at the dome in Socorro.*