

# OBSERVER

## A Pretty Pairing



**Moon and Venus Occultation**

Just before sunrise and minutes before occultation on April 22, 2009, Brad made this photo with his Pentax 5.25 Megapixel camera. The actual covering of Venus took place at dawn.

*Image copyright 2009 Brad Gilman*

### Inside the Observer

*President's Corner*..... 2

*Society Directory*..... 2

*June Speaker*..... 3

*Chief Observer, Jack Eastman*..... 4-5

*Outreach Opportunity*..... 4

*The G. Bruce Blair Medal*..... 6

*NASA's Space Place*..... 7

*Schedule of Events*..... *back page*

### Calendar

7.....	Full moon
15.....	Last quarter moon
22.....	New moon
29.....	First quarter moon

## JUNE SKIES *by Dennis Cochran*

The far-northern lunar crater Anaxagoras is mentioned by Charles Wood in the June *S&T*. It is named after an Ionian philosopher from the west coast of present-day Turkey who moved to Athens in the mid-400's BC to start the tradition that gave us Socrates, Plato and Aristotle. Anaxagoras was a cosmologist like his countrymen Thales, Anaximander and Anaximenes, and believed that the universe was naturally chaotic, made up of small invisible seeds or particles (the first atomist) and inhabited by a pervasive mind, or nous. By rotation, separation and combination the nous orders the chaos into objects and patterns. He understood eclipses, thought the Sun was made of molten metal and that other heavenly bodies were rocks cast off the Earth. Men and animals came from moist dirt. Anaxagoras was kicked out of Athens for his strange theories; all he got was a hard-to-find

but interesting crater near the Moon's north pole. This may be at the bottom of the disk in your telescope. Compare your view against the naked-eye view to find out, and check page 51 of the *S&T*.

Saturn is up in the southwest after sunset. Every other planet is up in the morning except Pluto (up all night), except that this elusive double world is not a simple point-and-stare proposition. Pluto moves thru the region above Sagittarius, and if you want to find it look on page 51 of the *S&T*.

We're getting into the season of globular clusters and the gaseous nebulae that are part of the furniture of the Milky Way. The globs in particular are the bright ornaments on our celestial tree. Last month we found the globu-

*Continued on Page 3*

## PRESIDENT'S CORNER

The June issue of the *Observer* opens by welcoming our newest members who are listed on Page 6. We are pleased to have you join us!

May was a good month for astronomers. Hubble underwent major upgrades to its cameras and the existing Advanced Camera for Surveys was repaired by astronomer-astronaut John Grunsfeld. During the same period, two European Space Agency spacecraft blasted off, their mission to decipher the mysteries behind the theoretical Big Bang and the creation of the Universe. The first spacecraft, Herschel, will look in the infrared part of the spectrum using the largest mirror to be launched into space. The 11.5-foot mirror is almost four feet larger than Hubble's. The second, Planck, will map the cosmic microwave background radiation, focusing on the coldest and oldest parts of the universe.

Some of you may have heard the phrase "dumbed down articles". This is a reference to keeping articles absent of technical and scientific terms that may not be understood by all readers. There are absolutes in the sciences of astronomy, physics and mathematics. There is an absolute in the environment of education and that is, any one of us knows something that others do not and I believe this knowledge should be shared. In our world of astronomical outreach to the public I don't think our only choices are presentations at the very basic level, or at a highly technical level where we will always lose someone. The better solution could be to mix the technical information in with the presentation and explain what it means as we go. We want to share what we learn and also challenge our audience to learn more.

Within the Denver Astronomical Society (DAS) outreach is one of our core missions. DAS conducts outreach through monthly Open Houses, twice weekly Public Nights and special events such as the International Year of Astronomy 2009, conducted at the University

of Denver's Chamberlin Observatory. Most of us seldom witness the "external" outreach in the form of star parties at schools, libraries and museums. DAS and all astronomers owe



### DAS President

Ron Mickel in the Meyer-Womble Observatory atop Mt. Evans.

*Photo by Joanie Mickel*

gratitude to the core group of individuals that consistently travel to these locations and set up telescopes, computers and projectors to bring the science of astronomy to others.

In April my wife and I visited grandkids in Michigan. One night, our kids invited neighbors over. As the Sun set and the sky cleared, Connor and Ryan pulled out their six inch Dob and started pointing out different objects in the sky to their friends Taylor, Wyatt, Emily, Dakota and Riley. When the scope was pointed to Saturn, it was a thrill for all. So much so that it soon became parents first, children second. As most of us know, this is how a few minutes set up time with a simple telescope can achieve lasting "outreach" to friends and family.

In closing, we owe a special thanks to Steve Solon and Wayne Green for the installation of two new monitors in the Dome room of Chamberlin Observatory. These monitors will be used for outreach and other educational purposes by DAS staff and classes conducted in the observatory. Steve will be providing written instructions to all outreach teams regarding the operation of the computer and monitors. Until then, please do not make any adjustments without first consulting Steve.

I look forward to seeing each of you at our upcoming events.—Ron Mickel

### Society Directory

<b>President:</b>	
Ron Mickel	(303) 229-6868 <i>president@denverastro.org</i>
<b>Vice President:</b>	
Keith Pool	(303) 718-7273 <i>vp@denverastro.org</i>
<b>Secretary:</b>	
Ron Pearson	(303) 670-1299
<b>Treasurer:</b>	
Brad Gilman	(720) 488-1028

### Executive Board Members

Jack Eastman	David Shouldice
Joe Gafford	Tim Pimentel
Ginny Kramer	Steve Solon
Frank Mancini	Dan Wray
	Wayne Green, Past President
	President Emeritus, Larry Brooks

### Committees

#### **Van Nattan-Hansen Scholarship Fund:**

Ron Pearson (Chair)  
P.O. Box 150743  
Lakewood, Colorado 80215-0743

#### **EGK Dark Site Committee:**

*Email: darksite@denverastro.org*

#### **IDA Representative:**

Dr. Robert Stencel  
*Email: coloida@botmail.com*

#### **Public Outreach Committee:**

Ron Mickel (Chair)

#### **Student Astronomy Chair:**

Naomi Pequette (Chair)

#### **Finance Committee:**

Frank Mancini (303) 663-5263

### Volunteers or Appointed Representatives

#### **ALCor:**

Darrell Dodge (303) 932-1309

#### **Newsletter:**

Editor: Patti Kurtz (720) 217-5707

*Email: p\_kurtz@comcast.net*

Proofreaders: Darrell Dodge and Steve Solon

**The Observer is available in color PDF format from the DAS website.**

#### **Website:**

Darrell Dodge

*Email: dmdodge@aol.com*

#### **Librarian:**

Phil Klos

**DAS Information Line:** (303) 871-5172

#### **DAS Correspondence:**

Denver Astronomical Society  
Chamberlin Observatory c/o Ron Mickel  
2930 East Warren Avenue  
Denver, Colorado 80210

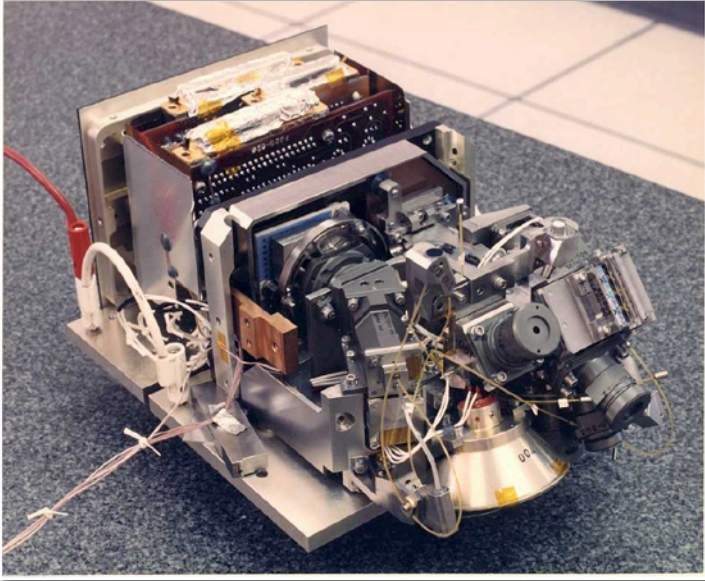
*The Executive Board conducts the business of the DAS at 7:30 p.m. at Chamberlin Observatory. Please see the Schedule of Events for meeting dates. All members are welcome.*

**[www.denverastro.org](http://www.denverastro.org)**



## LAURA ELLEN DAFOE TO SPEAK ON THE DESCENT IMAGER/SPECTRAL RADIOMETER (DISR) AT THE JUNE GENERAL MEETING

by *Laura Ellen Dafoe*



Laura Ellen Dafoe is currently overworked and underpaid but loving every minute of life as a stay at home wife and mother of three active girls, ages 13, 11, and 9. However, before gradually coasting into this so-called retirement last year, she worked for over 17 years on the Descent Imager/Spectral Radiometer (DISR, Photo at left). The DISR instrument was a primary science package on the European Space Agency's probe to Titan, Saturn's moon. This instrument held a suite of imagers and spectrometers viewing above and below the probe during its parachute descent through Titan's atmosphere to the surface on Jan 15, 2005. Dafoe held the position of Systems Lead at Lockheed Martin during the early conceptual phase through the flight build/test phase of the DISR program. Upon the advent of child number 1 during flight test (she did make it to the hospital), she left Lockheed Martin and began working as a

*Continued on Page 5*

### JUNE SKIES (CONTINUED FROM PAGE 1)

lar cluster M3 in the space between Coma Berenices and Boötes by aiming down the line of the simple 2-star asterism of Canes Venatici towards Arcturus. If we were to keep on going twice the M3-Arcturus distance past Arcturus to get down between the left end of Virgo and the long neck of Serpens Caput we would find another gem, M5 (Photo right).

Speaking of Arcturus, its kite-shaped constellation Boötes is not where we look for M-objects, but it has two wide-spaced double stars of contrasting color. Epsilon Boötes is the star midway along the left side of the elongated 'kite', with orange and green stars, while the other double, Mu Boötes, has white and orange stars and is found by going up to the next left-side star, Delta, then continuing ahead off of the kite and bending a bit to the right; it's on the *S&T* chart. In another nearby constellation without M-objects, Corona Borealis, the deep cup-shaped asterism just to the left of Boötes, there is the strange variable star R CrB down in that cup a bit left of the middle, where the 'S' is on the *S&T* chart. It has a strange light curve that seems to be due to clouds of carbon which the star produces and then hides behind at unpredictable times (p. 200 of the *Peterson Guide*.)

We looked at the upper end of Canes Venatici, between the handle of the Big Dipper and the 'corner' of Coma Berenices last month, and now we can explore the region east of it and below the end of the Dipper's handle for galaxies mention by Sue French on p. 56 of *S&T*, including the tight little cluster Hickson 68, M63 (the Sunflower Galaxy), and the interacting galaxy pair called The Heron. Looking at her pix will aid in locating these. This is almost as much fun as the Virgo Cluster, and a bit more off the beaten path.

Next month we'll venture down into the vast dark spaces of Ophiuchus, the huge constellation northeast of Scorpius, to find more globs. Meanwhile remember that the June Open House is late in the month on Saturday the 27th, while the General Meeting is early, on Friday the 5th. Sunday the 21st is the Summer Solstice. Start practicing the ancient song 'Sumer is acumin in: sing cuckoo!'



**THE GLITTERING JEWEL, M5**

This spectacular object in Serpens is one of the larger globular clusters known—it's about 165 light-years in diameter with more than 100,000 stars. Talk with Philip regarding image specs.

*Photo by Philip Good*

# FUTURE ASTRONOMER'S FIRST ENCOUNTER WITH A BIG TELESCOPE

by Jack Eastman



Jack Eastman, DAS Chief Observer  
Photo by Joe Gafford

David Nakamoto's latest article in the LAAS Bulletin brought back some fond memories of my own first encounter

with the 60-inch and Mt. Wilson in general.

Rewind the Earth in its orbit about 47 billion kilometers, I was in, or just out of high school, enjoying a wonderful night at Mt. Wilson's 6-inch refractor.

The Earth was about 6.6-billion km further back when my father and I were in the parking lot of the old Mt. Wilson hotel with my newly acquired 40mm Polarex (equivalent to the Unitron model 127) refractor. A gentleman came up and wanted a look, and of course I tried to show him a few objects. He then asked if we would like to look through "one of ours". Wow, sure! So we went up to this little dome near the 60-foot solar tower and fired up a "really big" 6-inch refractor. The man's name was Joe Hickox, then the resident Solar Observer at Mt. Wilson. We looked at the Moon, Saturn and several star clusters and double stars. Joe asked me if I'd like to point the telescope at something, of course I said, "YES!" Just as I loosened the clamps, it sounded like someone poured a bunch of ball bearing balls down a stove pipe. Panic! Yes, it got our attention.

What happened was the weight on the driving clock had reached bottom and triggered the rewind motor. Whew!, no harm no foul, but it did wake my dad and me up! Getting to know Joe, and his sense of humor, I think he knew the rewind was about to kick in just as I loosened the clamp, and scare hell out of us. It worked. And so it was, my introduction to Mt. Wilson, the 6-inch telescope. and a lifelong friendship with Joe Hickox.

As time went on, we were able to visit Mt. Wilson often and have the use of that wonderful 6-inch, which brings me to that night, mentioned above. (A photo of that 6-inch refractor appears in *The Birth of Stars and Planets* by Bally and Reipurth, fig 2.1, p 17)

O.K., fast forward those 6.6E9 kilometers. Several of us from the Los Angeles Astronomical Society, our high school astronomy club and friends were using the 6-inch. It was getting late and we were thinking of hitting the sack, when there was a knock on the door. It was Tommy Cragg, another Mt. Wilson solar observer, LAAS member and ace variable star observer.

## ALL INTERESTED MEMBERS, PUBLIC OUTREACH OPPORTUNITY

My name is Angie Richman, I work for the National Park Service and have just transferred from the Black Canyon of the Gunnison to our regional office here in Denver. I have a background in astronomy and have been doing astronomy education in the parks for 10 years. As part of my new job here in Denver I will be participating in many community outreach events and I would like to include astronomy concepts as much as possible. I would really like to establish a partnership with DAS by inviting your club to be involved in these events as well, if you are interested.

Coming up on June 13th is the National Get Outdoors Day event that will be held in City Park. Many different land agencies will be there with activities that encourage families and especially kids to get outdoors. There will be a climbing wall, REI will be there teaching kids to set-up tents, the Forest Service will be teaching them to fish, and as far as I know the NPS booth will be the only one with a night / astronomy theme. I thought it would be really great to have 2 or 3 solar telescopes set-up to show these folks our

nearest star. (I know it is not very interesting right now, but I think they would still enjoy it). Would there be 2 or 3 folks from DAS that have solar scopes that would be willing to help with this event?

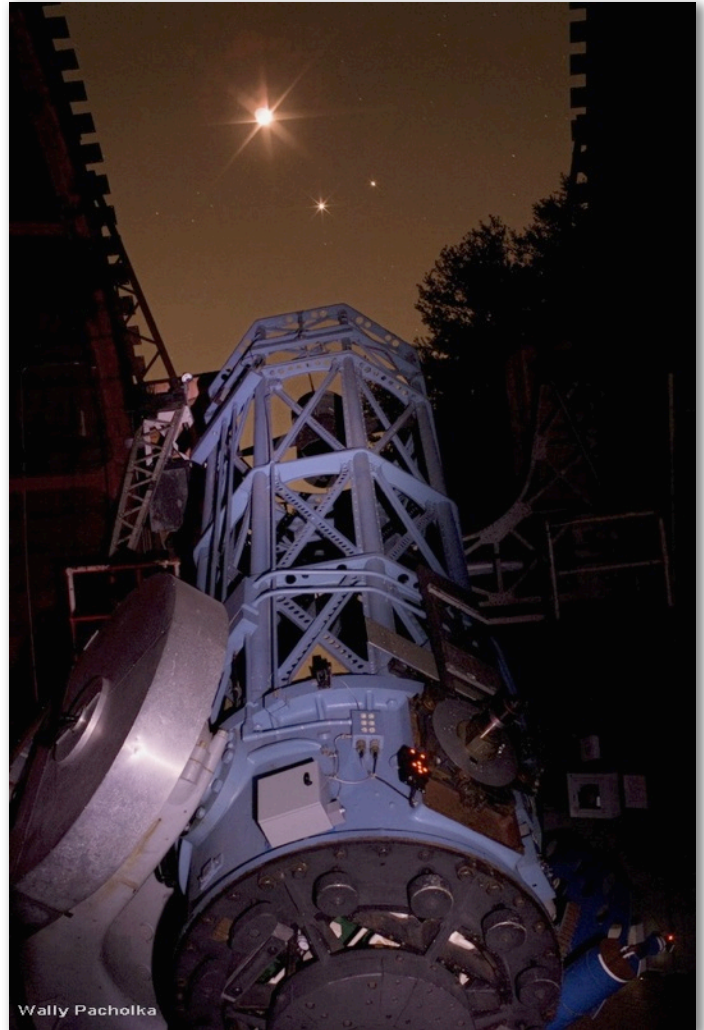
It is at City Park, on June 13th from 9am to 3pm. They are projecting that about 5000 people will attend. I plan to be there and at least 2 of my colleagues will be there as well. I am very familiar with solar telescopes having used a couple of 60mm coronados, PSTs, and the new Lunt solar scope. So I can help with the telescopes and the other rangers will be giving out handouts and UV bead bracelets.

Please give me a call if you would like to discuss this further.

Thanks for your consideration.—Angie Richman, Park Ranger Interpretation, Intermountain Regional Office, 303-969-2636

He asked us if we would like to come over and look through the 60-inch reflector. Would we?! You betcha! So we hoofed it over to the 60-inch which was pointed at Saturn. Saturn was low in the South which made for interesting gymnastics getting to the Cassegrain focus. We climbed onto the observer's platform, then onto the telescope itself, straddling the lower tube casting like it was a seriously overweight horse. Once we were in place, with a free hand we were handed a huge eyepiece, with rods sticking out of it so it couldn't be dropped through the opening onto the mirror. (Considered really bad form!) Leaning forward, we found the image and moved about in an attempt to get better focus. What I saw was a huge elliptical blob of light, looking much like an illuminated football in a dark swimming pool. Maybe a couple of darkish spots (between the ring and the ball) but really a disappointing view. Well, it was the Cassegrain focus, and at this early stage in my existence, the few Cassegrain telescopes I'd seen weren't much good. Well, the problem was (as you might have guessed by now) the seeing. It seems Dr. Dinsmore Alter (then Director of the Griffith Observatory) had the telescope for his research looking for evidence of Lunar outgassing and temporary local atmospheric phenomena. This required near perfect seeing, as his method was to take the highest resolution photographs possible in infrared and violet light, looking for possible differences in detail between the two wavelengths. Well, the seeing that night was so awful that after one look, he gave up and went back to bed. The telescope was set up and running and Tom remembered us over at the 6-inch, hence the invite. The seeing didn't seem to be all that bad at the 6-inch, and it looked O.K. in the 4-inch finder on the 60. There's a lesson here: Large telescopes are much more affected by seeing than small ones—a lesson often taught out here at Chamberlin where small 'scopes out on the lawn seem to outperform the 20-inch Clark.

Since that experience I've looked through the 60-inch many more times before my escape to Colorado. The telescope is good and the seeing that night was clearly the culprit. In the following years I have had the privilege of looking through and playing with larger telescopes than that venerable 60. I've beaten Mt. Wilson, twice, by a single, solitary inch. I had had several close encounters with the 61-inch Lunar and Planetary telescope at Mt. Lemmon in Arizona, and finally a couple of us had the 'scope for an entire night. R.B. Minton had the telescope, mainly for photographic work on Jupiter and confirmation of his discovery of the reddish polar caps of Io. When he was done with his photographic run, we stuffed in an eyepiece and hunted down all the objects we



**The 60-inch Telescope at Mt. Wilson**

*Photo by Wally Pacholka, AstroPics.com / TWAN*

could think of. David Nakamoto's observation that all the show objects we know and love are, indeed, too big for the field of such a large 'scope is definitely true, but looking into the cores of globular clusters like M-13 M-92 and the like were pretty spectacu-

*Continued on Page 7*

## JUNE SPEAKER (CONTINUED FROM PAGE 3)

Senior Staff Engineer directly for the DISR sponsor, the University of Arizona's Lunar and Planetary Lab in Tucson.

Before working on DISR, Dafoe worked at Lockheed Martin in a number of analysis positions, including sensor design, electronics noise characterization, thermal analysis and radiation shielding design. Back in the distant past she worked on the first concepts of Star Wars, but she can't remember anything about that.

Dafoe has a masters degree in Math in non-commutative algebras from University of Colorado. Her undergraduate degree is in Physics and Math from the South Carolina College, the honors college of the University of South Carolina. While at USC, she worked with Dr. Frank Avignone in research limiting neutrino mass and research in other high energy particle physics topics. Don't ask her about any of that either, except the time the shelving

holding all the computer codes' cards failed and dropped many thousands of cards in a calf-deep pile on the floor.

Dafoe enjoys her many activities with family, friends, church and community. She likes to teach occasionally, ages from kids to adults, topics from space to spirituality. She treasures time with her family, walks, books, dancing, swimming, good conversations, and Earl Grey tea.

# THE G. BRUCE BLAIR MEDAL FOR 2009 AWARDED

by Jon Wilson, Secretary, Western Area Astronomers (WAA)

The G. Bruce Blair Medal for 2009 has been awarded to Mike Simmons. Mike Simmons was a telescope operator at Griffith Observatory in Los Angeles in the mid 1970s. He went on to become president of the Los Angeles Astronomical Society (LAAS), the founding president of the Mt. Wilson Observatory Association (MWOA), and founding president of Astronomers Without Borders (AWB).

He has received the Clifford W. Holmes Award from the Riverside Telescope Makers Conference in 2005, for his many outreach and public education efforts. Minor Planet 22294 "Simmons" was named in his honor in 2003. He has also been an instructor in the Consortium for Undergraduate Research and Education in Astronomy (CUREA) program at Mt. Wilson Observatory. In 1999, Mike Simmons traveled to Iran to view the total solar eclipse. He returned to Iran several times to build international cooperation with the amateur astronomy community in Iran. In 2004, he returned to Iran to join Iranian amateur astronomers observing the transit of Venus. In 2006, Mr. Simmons journeyed to the Kurdistan region of northern Iraq with donated observing equipment for that isolated community of amateur astronomers. These efforts have blossomed into Astronomers Without Borders. AWB is a fully international effort at building peaceful social contacts through amateur astronomy.



Mike Simmons, 2009 G. Bruce Blair Medal Awardee

## WELCOME TO NEW DAS MEMBERS!

Dan Bergeron	Thomas MacLaughlin
Jack Brozna	Daniel Pettee
Michael Donovan	Laurie Scholl
Allan Jeffers	Robert C. White

## ABOUT THE DAS

Membership in the Denver Astronomical Society is open to anyone wishing to join. The DAS provides trained volunteers who host educational and public outreach events at the **University of Denver's Historic Chamberlin Observatory**, which the DAS



helped place on the National Register of Historic Places. First light at Chamberlin in 1894 was a public night of viewing, a tradition the DAS

has helped maintain since its founding in 1952.

The DAS is a long-time member in good standing of the **Astronomical League** and the **International Dark Sky Association**. The DAS' mission is to provide its members a forum for increasing and sharing their knowledge of astronomy, to promote astronomical education to the public, and to preserve Historic Chamberlin Observatory and its telescope in cooperation with the University of Denver.

The DAS is 501 (c)(3) tax-exempt corporation and has established three tax-deductible funds: the Van Nattan-Hansen Scholarship Fund, the Public Outreach Fund and the Edmund G. Kline Dark Site Fund. To contribute, please see the bottom of the membership form for details (found on the DAS website: [thedas.org](http://thedas.org)).

More information about the DAS, its activities and the special tax-deductible funds is available on the DAS website at [www.denverastro.org](http://www.denverastro.org).

## FUTURE ASTRONOMER ENCOUNTER (CONTINUED FROM PAGE 5)

lar. The Mt. Lemmon 'scope was set up as a Cassegrain at  $f/13.5$ , their 75mm eyepiece giving 275X with a field of view of only 0.12 degrees. Still, it was great fun to play with such a large (to us) telescope. 61-inch #2 was the Astrometric Reflector of the U.S. Naval Observatory at Flagstaff, Arizona. This one, designed for accurate positional measurements, is long focus ( $F/10$ ) mirror, folded in half with a large flat secondary. The operator set it on M-57, the ring nebula. I was amazed that the central star wasn't visible, as it had been at Mt. Lemmon. The operator said to punch the guide

motion, and lo, the star flashed into view from behind the cross-hair in the eyepiece. The telescope settings were so accurate that the star was hidden by those crosshairs!

It was quite a thrill to actually look through these instruments, at the time some of the largest around. This certainly helped cement my lifelong love for astronomy, and science in general. I can only hope some youngster might have a similar experience and be guided into a career in the sciences.

## NASA'S SPACE PLACE: SCORING MORE ENERGY FROM LESS SUNLIGHT

For spacecraft, power is everything. Without electrical power, satellites and robotic probes might as well be chunks of cold rock tumbling through space. Hundreds to millions of miles from the nearest power outlet, these spacecraft must somehow eke enough power from ambient sunlight to stay alive.

That's no problem for large satellites that can carry immense solar panels and heavy batteries. But in recent years, NASA has been developing technologies for much smaller microsattellites, which are lighter and far less expensive to launch. Often less than 10 feet across, these small spacecraft have little room to spare for solar panels or batteries, yet must still somehow power their onboard computers, scientific instruments, and navigation and communication systems.

Space Technology 5 was a mission that proved, among other technologies, new concepts of power generation and storage for spacecraft.

"We tested high efficiency solar cells on ST-5 that produce almost 60 percent more power than typical solar cells. We also tested batteries that hold three times the energy of standard spacecraft batteries of the same size," says Christopher Stevens, manager of NASA's New Millennium Program. This program flight tests cutting-edge spacecraft technologies so that they can be used safely on mission-critical satellites and probes.

"This more efficient power supply allows you to build a science-grade spacecraft on a miniature scale," Stevens says.

Solar cells typically used on satellites can convert only about 18 percent of the available energy in sunlight into electrical

current. ST-5 tested experimental cells that capture up to 29 percent of this solar energy. These new solar cells, developed in collaboration with the Air Force Research Laboratory in Ohio, performed flawlessly on ST-5, and they've already been swooped up and used on NASA's svelte MESSENGER probe, which will make a flyby of Mercury later this year.

Like modern laptop batteries, the high-capacity batteries on ST-5 use lithium-ion technology. As a string of exploding laptop batteries in recent years shows, fire safety can be an issue with this battery type.

"The challenge was to take these batteries and put in a power management circuit that protects against internal overcharge," Stevens explains. So NASA contracted with ABSL Power Solutions to develop spacecraft batteries with design control circuits to prevent power spikes that can lead to fires. "It worked like a charm."

Now that ST-5 has demonstrated the safety of this battery design, it is flying on NASA's THEMIS mission (for Time History of Events and Macroscale Interactions during Substorms) and is slated to fly aboard the Lunar Reconnaissance

Orbiter and the Solar Dynamics Observatory, both of which are scheduled to launch later this year.

Thanks to ST-5, a little sunlight can go a really long way.

Find out about other advanced technologies validated in space and now being used on new missions of exploration at <http://nmp/TECHNOLOGY/scorecard>. Kids can calculate out how old they would be before having to replace lithium-ion batteries in a handheld game at [http://spaceplace.jpl.nasa.gov/en/kids/st5\\_bats.shtml](http://spaceplace.jpl.nasa.gov/en/kids/st5_bats.shtml).

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*



**ST-5 Assembly**

Helen Johnson, a spacecraft technician at NASA's Goddard Space Flight Center, works on one of the three tiny Space Technology 5 spacecraft in preparation for its technology validation mission.

*Photo Courtesy NASA/JPL*

## S&S OPTIKA HAS MOVED TO:

6579 SO. BROADWAY  
LITTLETON, CO. 80121  
(~1 1/2 blocks NORTH of  
Arapahoe Road on the  
WEST side of South  
Broadway)

**(303) 789-1089**  
[www.sandsoptika.com](http://www.sandsoptika.com)

## DAS SCHEDULE

### JUNE

- 5 General Meeting at D.U.'s Olin Hall (Begins at 7:30 P.M.)
- 12 E-Board meeting at Chamberlin Observatory (Begins at 7:30 P.M.)
- 19-21 EGK Dark Sky weekend
- 19-21 RMSS (See Page 4).
- 27 Open House at Chamberlin Observatory (Begins at 8:30 P.M.)

### JULY

- 4 Independence Day
- 10 General Meeting at D.U.'s Olin Hall (Begins at 7:30 P.M.)
- 17 E-Board meeting at Chamberlin Observatory (Begins at 7:30 P.M.)
- 18-20 EGK Dark Sky weekend
- 25 DAS Picnic (Begins at 3:00 P.M.) and Open House (Begins at 8:30 P.M.)

*Public nights are held at Chamberlin Observatory every Tuesday and Thursday evenings*

*beginning at the following times:*

*March 9 - April 14 at 8:00 p.m.*

*April 15 - September 1 at 8:30 p.m.*

*September 2 - March 8 at 7:00 p.m.*

*Costs to non-members are: \$3.00 adults, \$2.00 children.*

*Please make reservations via our website ([www.denverastro.org](http://www.denverastro.org)) or call (303) 871-5172.*



The Denver Astronomical Society  
C/O Chamberlin Observatory  
2930 E. Warren Ave.  
Denver, Colorado 80210

### The DAS Now Has a FACEBOOK Site.

Search Denver  
Astronomical  
Society at  
Facebook.com  
and join up!

We can share  
photos, stories,  
anecdotes, etc.