



AU AstroNews

The Newsletter of the Astronomical Unit

March 2003

Sponsored by the Santa Barbara Museum of Natural History

Mirrors and Solar Eclipses

Last month we had two speakers. One was our AU secretary, Dr. Craig Prater, who spoke of his recent trip to the Australian outback to chase a total solar eclipse. He says, "The presentation was a blast. It was like reliving the big event. I hope I helped spawn a new generation of eclipse chasers." Thanks for the inspiration, Craig! The other speaker was AU member Tom Whittemore, who gave a talk on mirror making. Tom's presentation created a lot of interest among members, so he will be offering a mirror making workshop. The course will concentrate on mirror making, but Tom is confident that other members could give good advice on how to ultimately construct a variety of well-made telescopes. The workshop will involve work on 6", 8", and 10" mirrors and the kits will run \$75 for the 6" kit, \$150 for the 8" kit, and \$200 for the 10" kit. The kits will contain all the materials, instruction, and testing to complete a high-quality mirror. There will be a sign-up sheet at the next Friday meeting for anyone interested in joining the fun. Tom is also more than happy to help those who already have a "mirror in progress". The classes will be held on the SBMNH campus, but Tom still needs to work out all the details with Krissie Cook. Please contact Tom at kometes@aol.com for details on the exact location. Thanks Tom!

March Speaker

Our speaker for March will be Dr. Stephen J. Edberg, who will speak on "The exploration of the Saturn system by an orbiting spacecraft over a four-year mission". The Cassini spacecraft arrives at Saturn in less than 17 months. This spacecraft is so advanced that it will provide huge volumes of data that will, in many cases, rewrite what we know about the planet. Steve will present our current state of knowledge and what the known mysteries are, so we can better follow Cassini's exploits when it arrives on July 1, 2004. The talk will include the Cassini mission trajectory, status, and results to date, the Cassini plans for arrival at Saturn, and the Huygens

probe exploration of Saturn's largest satellite, Titan. It will also include the Cassini orbiter's four-year tour of the Saturn system, and the mysteries of the planet, rings, satellites, and magnetosphere. Steve has been an Astronomer at the Jet Propulsion Laboratory, California Institute of Technology, National Aeronautics and Space Administration for 23 years. He has been a participant in the Cassini mission to Saturn for 11 years, and earlier with the Galileo mission to Jupiter. He is also the Grand Poobah of the annual RTMC Astronomy Expo.

February Outreach Volunteers

Outreach volunteers Warren & Liliana Bitters, John Boyd, Joe Brown, Dora Drake, Chey Hahn, Art Harris, June Kelley, Pat and Chuck McPartlin, Edgar Ocampo, Helen Osenga, Ron Pembleton, and Jim Williams showed the cool stuff in the night sky to 514 customers since the last newsletter.

AU Events for March

Saturday, March 1, all night – Dark Sky observing. Contact Paul Winn (strg8zn@cox.net) to find out where and when.

Friday, March 7, 7:30 PM – Monthly meeting in Farrand Hall at SBMNH.

Saturday, March 8, 4 PM – AU planning meeting at SBMNH at Krissie's office. Everyone's welcome - get involved in AU activities!

Saturday, March 8, 6 PM – Monthly Public Star Party at SBMNH.

Monday, March 10, setup 6:30 PM – Telescopes for 100 5th graders and their siblings, parents, and teachers at Franklin School.

Wednesday, March 12, 8 PM – Free lecture by the Kavli Institute for Theoretical Physics on "The Physics of Star Trek" at UCSB. Call 893-4111 for

reservations. For more info try this link:

<http://www.kitp.ucsb.edu/activities/public/lkrauss03/?id=286>

Friday, March 21, 7:30 PM – Monthly Public Observation at Westmont College's Van Kampen Observatory.

Tuesday, March 25, setup 5:30 PM – Telescopes for Hope School Science Night.

Saturday, March 29, all night – Dark Sky and Messier Marathon at the Gun Club. As usual, we will have observing handouts listing a suggested order for tackling the Messier Catalog for both setting-circle users and star-hoppers.

Remember that outreach events often change at the last minute. Contact Edgar or Chuck for the latest developments.

Speaking of Eclipses

See Three Annular Eclipses This Month! Right now Jupiter is in a phase of its orbit that occurs every six years (twice per orbit) where the plane of the orbits of the Galilean Moons is very edge-on to the Earth. When this happens, in addition to the normal transits, eclipses, and shadow transits of the Galilean Moons and Jupiter, you can see mutual transit and eclipse events among the moons themselves. This month, you can see three annular eclipse events, where one moon casts its shadow onto another, but doesn't entirely shade it. On Saturday, March 8, at around 11:20 PM PST, you can watch Callisto eclipse Io for a total of 94 seconds. All four moons will be strung out on one side of Jupiter. Their order from Jupiter outward will be Io, Callisto, Europa, and Ganymede. On Monday, March 10, near 1:55 AM PST, Io will eclipse Europa for about 40 seconds. Once again, all four moons will appear on one side of the planet. Their order outward from Jupiter will be Europa (very close), Io, Ganymede, and Callisto. On Monday, March 24, near 8:10 PM PST, Callisto will eclipse Europa for over two minutes. Ganymede will be invisible behind Jupiter. Io will be alone on one side of the planet. On the other side will be Callisto and Europa, with Callisto closer to Jupiter. Unless you have excellent viewing conditions, you will have trouble seeing the disks of the moons, and thus the ring effect of the annular eclipse, but you should still see the brightness of the eclipsed moon drop appreciably. None of these

events will be as spectacular as a solar eclipse, but at least you can watch them from your own back yard!

Astronomy Questions?

Based on an inquiry at one of the planning meetings, we've set up an email address where folks can send astronomy questions. Any and all astronomy questions are welcome! Send your email to: ask_the_astronomer@yahoo.com

National Dark Sky Week

With National Dark Sky Week coming up April 1-8, the AU would like to encourage members and the community to do what they can to reduce light pollution. For example, consider replacing light-polluting fixtures with full-cutoff fixtures. Full cutoff fixtures direct the light down towards the parts of your property you want to illuminate and reduce stray light going where it isn't wanted. Here are some light fixtures that are good for dark skies: <http://www.darksky.org/fixtures/fixtures.html>
Specific links for residential & floodlights: <http://www.darksky.org/fixtures/res.html>
<http://www.darksky.org/fixtures/flodspot.html>

More Cool Links

Here is a site that shows a fantastic spacecraft journey to Mars and beyond. This is not only educational, but fun. Most images are from NASA. <http://www.spacewander.com/USA/english.html>

AU member Tim Crawford found Feynman's 1960 lecture on the future of small stuff (which spawned nanotechnology) to be very interesting and prescient: <http://www.zyvex.com/nanotech/feynman.html>

New AU Equipment

At Jim Williams' request, the AU bought a color video camera eyepiece. Krissie then requisitioned a SBMNH television on a roll-cart. These will be attached to a dedicated telescope for viewing at each SBMNH Star Party on the second Saturday of each month. At the last star party, the consensus was that we should have done this years ago. The views of the moon and Saturn were crisp and clear, and could even be videotaped for later enjoyment.

Request for Equipment

Tony Galvan is soliciting for spotting scopes and tripods to be donated to the Eyes in the Sky (EITS) and Meet Your Wild Neighbor (MYWN) programs; part of the Santa Barbara Audubon Society's outreach. The EITS program takes a raptor into a middle school classroom and helps children learn about man's impact on wild creatures (not all their birds can be released back into the wild). The MYWN program takes

children from schools into the field and works to educate them about their wild neighbors and why it's important they help protect their habitat. The majority of the schools visited have a high level of students from low-income families. This is where the program can use a spotting scope or two (nothing fancy) and a tripod or two. Plus, they could use binoculars (6Xs are better than 8Xs or 10Xs) for the field trips (little hands, no stability). The items do not have to be new. Tony is asking the AU folks because astronomers are birders and vice versa. The Santa Barbara Audubon Society is a 501 c-3 non-profit so any donation is tax deductible. Questions can be directed to Tony at 685-5387 or galvan@dosgatos.com.



Invisible TORNADOS by Dr. Tony Phillips

The biggest problem with tornados—next to the swirling 300-mph winds—is that it's hard to see them coming. But soon scientists will be able to foresee, not merely tornados, but the severe storms that spawn them, hours before there's even a cloud in the sky! Mind you, this isn't a vague "30 percent chance of rain today" type forecast. Thanks to a new satellite technology being co-developed by NASA, NOAA and the U.S. Navy, emergency personnel will actually watch the invisible beginnings of a storm unfold. "They're going to know where the storm centers are forming before the storms are there," says James Miller, project manager for Earth Observing 3 (EO3), a satellite that will test out this new technology in 2005 or 2006. Unlike the tiny water droplets that make up clouds, the water vapor that feeds storms is invisible to the human eye. Water vapor is easy to detect, however, at infrared (IR) wavelengths. EO3 will use an IR-sensitive device called GIFTS—short for Geosynchronous Imaging Fourier Transform Spectrometer—to make 3D movies of temperature, pressure, and water vapor in Earth's atmosphere. Three or four hours before the storm clouds are visible, meteorologists will notice water vapor converging toward an area. This water vapor, which provides the "fuel" for the coming storm, is too close to the ground for today's weather satellites to see. Then meteorologists will check precisely how the air temperature over that area varies vertically (something else ordinary satellites can't do). This temperature variation determines whether the humid air will rise to form storm clouds. And when these conditions look ominous, the meteorologists can alert the public. The goal of EO3 is to "test drive" this new technology and prove that it works. If successful, NOAA plans to incorporate GIFTS-style sensors into its next generation of weather satellites. These future satellites will give meteorologists exactly what they need in order to give the people exactly what they need: an earlier warning that tornados may be on the way. GIFTS and EO3 are managed by NASA's New Millennium Program. NASA and NOAA will operate EO3 during its first year in geosynchronous orbit above the United States. If the technology works as planned, the U.S. Navy will assume control of EO3, move the satellite to a point above the Indian Ocean, and use it to monitor weather in shipping lanes there. The EO3 web site at <http://nmp.jpl.nasa.gov/eo3> has more about the mission and the GIFTS instrument.

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