

Main Speaker: Dr. Thomas Berger

A Clear View of the Dynamic Sun

Program notes by Marni Berendsen

The International Year of Astronomy (IYA) continues with the May theme of Our Sun.

On May 26th, Dr. Thomas Berger of the Lockheed Martin Solar and Astrophysics Laboratory will share highlights from the Japanese/US/UK “Hinode” (Sunrise) satellite mission. This enlightening mission has been observing the Sun nearly continuously since its launch in November of 2006.

Dr. Berger will focus on his work with the Solar Optical Telescope (SOT), one of the instruments aboard Hinode. SOT has revealed new and very mysterious dynamics in prominences, those large systems of gas we can see protruding from the edges of the Sun in our hydrogen alpha telescopes.

Studying the dynamics of these prominences may lead to a better understanding of large “coronal mass ejections” or CMEs. CMEs can impact Earth and destroy orbiting satellites and/or disrupt terrestrial radio communications.

Although the Hinode mission is less than three years old, it is safe to say that it has provided us with revolutionary data for studying the solar magnetic field and its effects on the solar system.

The Lockheed Martin Solar and Astrophysics Laboratory is in Palo Alto, California. Dr. Thomas Berger is a solar physicist and earned his Ph.D. in Applied Physics from Stanford University in 1997, working with Dr. Alan Title at Lockheed Martin. He is currently a Chief Observer for the SOT instrument, traveling frequently between the US and Japan.

Be sure to catch Dr. Berger’s talk about our nearest star.

Upcoming programs:

June 23: Clusters of Stars: Members share the universe

July 28: Dr. Steven Beckwith, The Dawn of Creation: The First Two Billion Years



What’s Up? Speaker: Ken Coates

Sunspots: From Galileo to Global Warming

Since this is the International Year of Astronomy and celebrates the 400th anniversary of Galileo’s first use of the telescope to look at space, this talk will start with Galileo’s observation of sunspots, examine the sunspot record over the centuries since, and relate solar activity to Earth’s climate.

An intriguing new theory of how the Sun’s magnetic field affects Earth’s climate by modulating the amount of cosmic rays that reach the atmosphere will be explored. In the last 1200 years the Earth experienced the Medieval Warming Period and the Little Ice Age. These climate events show a striking correlation with sunspot cycles.

The Earth has gone through many hot and cold climate swings in its history. The very long term cycle (on the order of 140 million years) may be explained by the passage of the solar system through the Milky Way galaxy.

Ken Coates • ken@betacygni.com

Get Your Diablo Moonwatch Online

by Liede-Marie Haitsma

Those members of the Mount Diablo Astronomical Society who receive their copy of the Moonwatch electronically (via email or the website) have already read this article, because they got their copy a few days ago online. They were able to admire the colors in the articles, and if they chose, could print out the issue. This would be the preferable, faster, economical and more environmentally sound method of distribution.

For those of you who are receiving the Moonwatch by US Mail, we would invite you to consider joining this group and help cut down on the costs of printing and mailing.

Just send an e-mail to the Membership Chair, Tom Harris, at memberinfo@mdas.net. This will assure that we have a valid e-mail address for you. You must also be sure that incoming mail from the Editor is not blocked by your spam filter.

Soon after it is mailed to members, the Moonwatch is also posted on the MDAS web site.

Thank you.

Diablo Moonwatch Submissions

by Rob Haitsma

The Moonwatch is always looking for interesting and timely additions to its content. Astronomy related articles, images and reviews will gladly be accepted for inclusion. Items however, must be in an editable digital format.

Please send all items to Rob Haitsma (sjshark2@ix.netcom.com). Thank you very much.

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Meetings are held:

Fourth Tuesday every month, except on the third Tuesday in November and December.

Refreshments and conversations are at 6:45pm.

Meetings begin at 7:15pm.

Where:

Concord Police Association Facility

5060 Avila Road, top of the hill.

Take Avila Road from Willow Pass Road.

Directions to facility:

http://nightsky.jpl.nasa.gov/club-view-directions.cfm?Address_ID=18

Satellites and Birds

by *Liede-Marie Haitzma*

There are two kinds of satellites. Artificial satellites, those who have been placed into orbit by humans, and Natural satellites, such as the Moon. The first artificial satellite was Sputnik 1, launched by the Soviet Union on October 4th, 1957, and initiating the Soviet Sputnik program. This in turn triggered the Space Race between the Soviet Union and the United States.

Earth observation satellites are satellites intended for non-military usage such as environmental monitoring, meteorology, map making etc. The latter part of the twentieth century and early twenty-first century has brought various satellites, through NASA, to study and observe the various areas of our Earth. The **Earth Observing System (EOS)** is a program of NASA comprising a series of artificial satellite missions and scientific instruments in Earth orbit designed for long-term global observations of the land surface, biosphere, atmosphere, and oceans of the Earth. The satellite component of the program was launched in 1997. The program is centerpiece of NASA's **Earth Science Enterprise (ESE)**.

Argos is the satellite-based system which was established in 1978 to process and disseminate environmental data from fixed and mobile platforms worldwide. It utilizes the Doppler Effect to study marine mammals and sea turtles of both coastal and oceanic species. Argos was developed between the **Centre National d'Etudes Spatiales (CNES, the French space agency)**, the **National Aeronautics and Space Administration (NASA, USA)** and the **National Oceanic and Atmospheric Administration (NOAA, USA)**. The Argos satellites collect data on every orbit from several hundred **platform terminal transmitters (PTTs)**.

Radio transmitters have been used in research studies to gain additional information about avian biology that cannot be obtained with leg bands or other methods. Since 1996, biologists at the Alaska Science Center - Biological Science Office used surgically-implanted radio transmitters to locate the Bering Sea wintering area of the Spectacled Eider; a threatened species that nests in western and northern Alaska. Transmitters have also been used to study the lingering effects of the Exxon Valdez oil spill on Harlequin ducks in Prince William Sound; response of White-Fronted geese to aircraft disturbance; and Red-Throated Loon migration from breeding to wintering areas. With additional tracking of wildlife by satellite as they migrate regarding Polar Bears, Long-tailed Ducks, Common Eiders, Brants, Sockeye Salmon, Walrus, Pintail Ducks, Bar-tailed Godwits, Bristle-thighed Curlews, and Long-billed Curlews.

Until very recently, scientists had little idea about the actual route that migratory songbirds take on their yearly trek. They knew the general areas where birds nest, pass through on migration, and spend the winter. But for an individual bird, the exact time they leave to migrate, how long it takes them to migrate, and the exact locations they stop were a complete mystery.

All this changed, in 2005/2006, with the use of geolocators, tiny mechanical devices attached with a harness to the bird's back and a little loop that goes around each leg, to track their locations much as a GPS unit does, to spy on Wood Thrushes and Purple Martins. In 2008, geolocators were attached to Bobolinks in Vermont and Seaside Sparrows in Delaware. This summer, 2009, geolocators will be attached on the rare Bicknell's Thrush and the Wood Thrush to study their breeding ranges.

What are **geolocators** — a tiny bird backpack that contains sophisticated sensors and weighs less than a dime (about 1.5 grams). The new technology has opened up vast new possibilities for bird researchers. Already, it is yielding surprising findings — for example, that some birds fly even faster than previously thought. But its real importance, biologists say, is the opportunity to unlock mysteries of bird migration that could help preserve species threatened by habitat loss and climate change. It involved 34 birds, but only 7 were recovered with their sensors. The tracking system relies on instruments called solar geolocators that collect and store data on where the birds are in relation to the sun. Researchers remove the sensors, download the information and calculate where the birds were, and when they were there. The devices could not transmit data in real time, but they recorded the exact time of sunrise and sunset, allowing the researchers to download the data later and calculate where each bird was on any given day. Analyzing the sensor data, the researchers found that their birds flew two to six times faster going north than south — up to about 370 miles in a day, which she said was much faster than had been thought. A female martin flew almost 5,000 miles in 13 days, including 4 stopover days. The only bird unable to use the geocator is the Hummingbird.

The PPT's, weigh less than seven-tenths of an ounce. The hermetically sealed housing is about the size of a BIC lighter with an eight-inch stainless steel antenna. Inside is an electronic module with sensors to measure temperature and an animal's activity. The unit can be programmed to transmit at a steady rate during migration and be virtually dormant when the bird is nesting and sedentary. It was used to study peregrine falcon migratory paths, the migrations of eagles and other large birds, such as the albatrosses.

The Snowy Owl also proved to be a recent wonder when satellite studies found them far out on the Arctic sea ice. They also flew great distances as one was seen in North Dakota, while another ended up on the eastern point of Newfoundland.

I spend a great deal of time looking up. At night to the stars, Moon, Jupiter, Saturn, and those tiny lights going across the night sky, satellites. During the day not only to the Sun, but especially to birds. As an avid birder I'm fascinated watching them, and with the use of modern technology we are gathering knowledge that once was unknown and only guessed at. So next time you watch one of those feathered friends in your yard or flying overhead, they might be transmitting information to a satellite further above.

2009 Yosemite Star Party



Yosemite 2009

by Leroy Wiens

The MDAS date for the annual Yosemite star party extravaganza is August 14-15. This is a third-quarter moon weekend with moonrise after midnight. The public star parties are scheduled for both Friday and Saturday evenings. The public usually thins out after about 10 or 11pm, so you can enjoy the dark skies as you wish after that. You can pick up a flier at the MDAS meetings, and I hope you will take advantage of this opportunity to visit Yosemite with free entry to the park and free camping at Bridalveil Campground. It is a spectacular place for a star party, as you can see from this photo taken during set-up a couple of years ago.

The IYA theme for May is Our Sun.

Celebrate the International Year of Astronomy 2009 with the **IYA Discovery Guides**:
<http://www.astrosociety.org/iya/guides.html>

The May Discovery Guide provides tips to safely observe the Sun and about the Earth's relationship to our closest star.. Enjoy a new theme, story, activity, and observing object each month!

Featured Observing Object for May:
 The Sun

May Discovery Guide:
http://nightsky.jpl.nasa.gov/download=view.cfm?Doc_ID=304



MDAS Outreach in May

Date	Venue	City	Time	Notes
May 27 or 28th	Hannah Ranch Elementary	2480 Refugio Valley Rd., Hercules	setup 7pm	We're hoping one of these dates will be clear!
May 29th	Walnut Acres Elementary	Walnut Creek	setup 7pm	Doug Grebe
For information regarding upcoming and possible future events, please contact: MDAS Outreach Program Chair: Jim Head, outreach@mdas.net				

MDAS Meetings and Viewing Events in May / June

Date	Event	Location	Time	Topics
May 12th	Imaging SIG Meeting	Walnut Creek	7:00pm	
May 23rd	Society Night	Mount Diablo		
May 26th	MDAS General Meeting	Concord	6:45 / 7:15pm *	
May 30th	Public Night	Mount Diablo		
June 9th	Imaging SIG Meeting	Walnut Creek	7:00pm	
June 20th	Society Night	Mount Diablo		
June 23rd	MDAS General Meeting	Concord	6:45 / 7:15pm *	
June 27th	Public Night	Mount Diablo		
* Refreshments and conversations are at 6:45pm. Meetings begin at 7:15pm.				

Event Announcements

Date	Event	Notes
May 22-25th	Riverside Telescope Makers Conference / Expo http://www.rtmcastronomyexpo.org/general.html	
June 20-24th	Golden State Star Party http://goldenstatestarparty.blogspot.com	
August 14-15th	Yosemite Star Party Contact: Leroy Wiens mailto:ldwiens@pacbell.net	See article in this newsletter.

Book Review

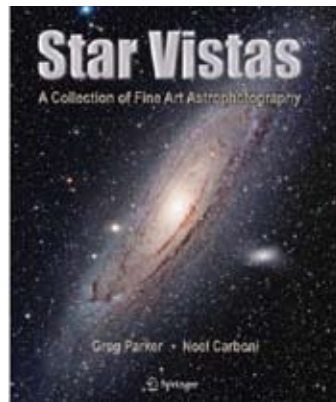
Star Vistas

A Collection of Fine Art Astrophotography

by Robert Haitsma

You know a book is special when the Forewords are written by Sir Arthur C. Clarke, Dr. Brian May and Sir Patrick Moore. Star Vistas is a book showcasing the Astrophotography talents of Greg Parker and Noel Carboni.

Greg Parker is a professor at the University of Southampton, Hampshire in the UK. He has published over 120 scientific papers and is a very accomplished imager.



Noel Carboni is a software engineer and recently founded ProDigital Software, his own company. As well as being an excellent imager, Noel is also known for his ground-breaking work developing Photoshop plug-ins in the form of his popular, "Noel Carboni's Actions."

The book is loaded with images that both Greg and Noel have collaborated on, from deep space to images of the moon. All of the images are crystal clear and include a description of the object itself as well as a small sentence telling of how the image was taken and any special work done to it.

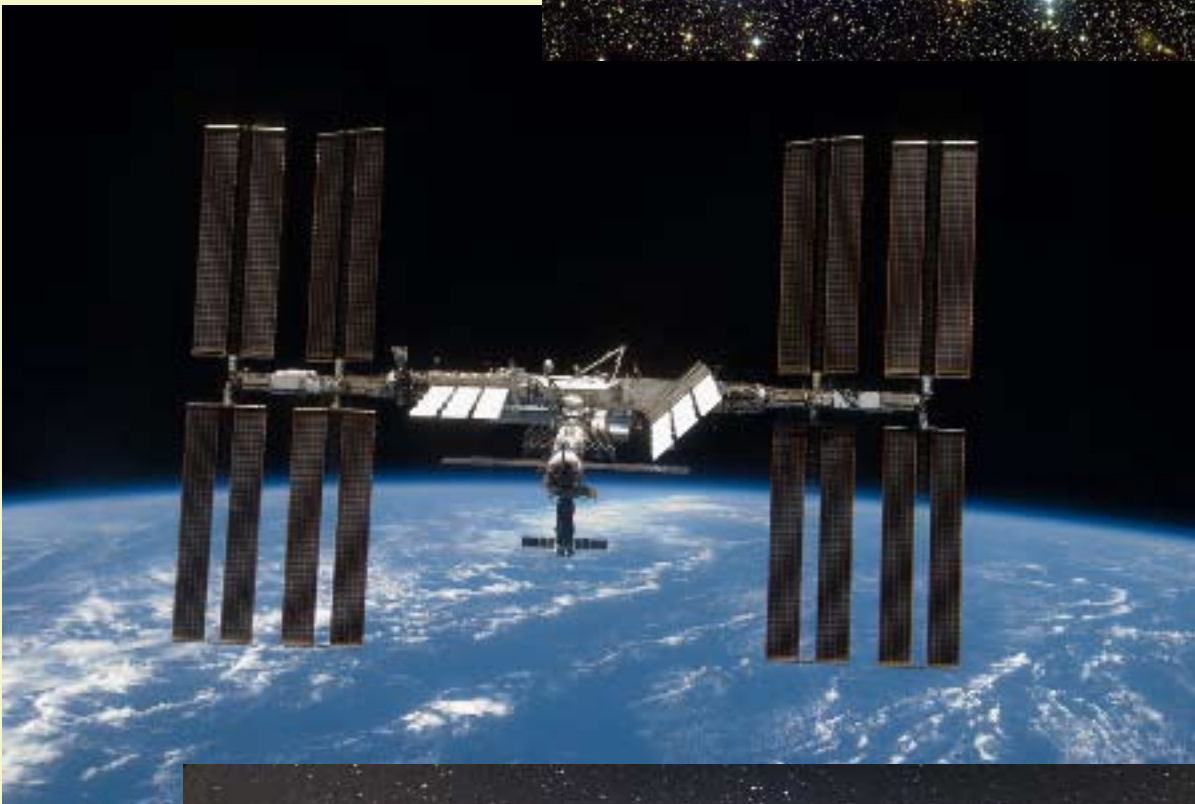
The images in the book were created using two systems. One, a Celestron C11 equipped with a HyperStar by Starizona (a system which replaces the secondary mirror with a lens and camera) and the second system using a Takahashi Sky-90 refractor. Both systems were using cameras by

Starlight Xpress. The processing was done using Maxim DL and Adobe Photoshop.

The images in Star Vistas are beautiful and showcase what can be done with today's equipment. I highly recommend this book to anyone interested both in Astronomy and Astrophotography.



Astronomy
Picture of the Day



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