# Mount Diablo Astronomical Society

## Diablo MoonWatch

April 2013


**General Meeting**

**Tuesday April 23, 2013**

## Magnetism, Space Weather, and Atmospheric Evolution at Mars

*By Dr. Matt Fillingim*

**Doors open at 6:45 p.m.**
**Lindsay Wildlife Museum**
**1931 First Avenue,**
**Walnut Creek, CA 94597**

*Please park East of the museum, follow the instructions on the last page*

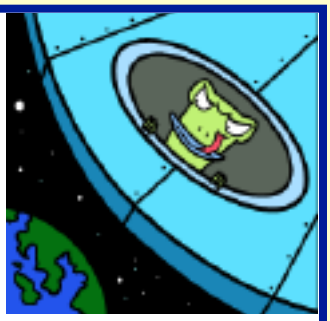
***Unlike Earth, Mars does not have a global scale magnetic field. However, it does have intense and localized crustal magnetic fields.***

Earth's planet-wide magnetic field is thought to shield our atmosphere from the solar wind. Without such a shield, the solar wind has impacted the atmosphere of Mars over the past few billion years substantially changing it. Dr. Fillingim will discuss some of the recent ideas about the history of Mars' magnetic field and how (and why) the atmosphere and climate of Mars has changed. He will also introduce then next mission to Mars, MAVEN, slated to launch in late 2013, which is designed to decipher the atmospheric history of Mars.

Matt Fillingim has been a research scientist at the Space Sciences Laboratory at the University of California, Berkeley, since 2002. Prior to that, he received his Ph.D. in Geophysics from the University of Washington in Seattle and both his B.S. and M.S. in Space Sciences fromthe Florida Institute of Technology in Melbourne, FL. His current research focuses on the magnetic fields and tenuous, ionized gas (aka plasma) surrounding Earth, the Moon, and Mars. He has also been the astronomy instructor at Berkeley City College since 2008.

*Pan-Starrs comet by John Read*

**What's Up**



### *"Space-Creatures"*

**I will share my un-earthed "friends" with you, as we journey through their amazing life, death and. . . rebirth?**

*By Moon Trask*

# President's Corner

## Keeping Steady With Binoculars

*by Chris Ford*

***It is a maxim that every astronomer needs a pair of binoculars.***

For myself, I have two pairs of 7 X 50 and 10 X 50's that have been in my possession for over 30 years. They were given to me by my parents to whom in turn they were given by a film director who used them to scout out locations for shoots. In fact I don't know how old they are or even who the (long-extinct) maker is, but that's not important, they are MY binoculars of great sentimental value, almost indestructible, and they have delivered a wonderful service over the years. I suspect that many of us have similar relic instruments of comparable personal value. However it has become increasingly clear of late that my binoculars do not really compare to what a modern pair of binoculars can deliver in terms of clarity and performance.

*The business end of my hard used and venerable 10 X 50's*

Neither are they that comfortable to use compared to contemporary binoculars that I have recently tried out, all of which led me to look for a new set that are more up to date so I can give my existing pair a long overdue rest.

*These binoculars must be pretty vintage as everything is solid metal. No plastic or rubber anywhere.*

Another common problem experienced with binoculars is keeping the view still and free of "the shakes" (especially the 10 X 50's) and avoiding neck ache while looking at anything over 45 degrees above the horizon unless lying on a recliner. There is though something particularly comforting in viewing with both eyes as our brains are designed to handle a 50% crossover of optical information from both our left and right eyes. This is also a reason when using a binoviewer on a conventional telescope, why though the incoming light is split 50%, the experience can seem nearly as bright as viewing through a mono eyepiece because of the way the brain synthesizes the visual information.

***So binocular viewing is a very natural process and wanting the best experience, I recently decided to update my vintage binoculars with a new set, as everything I read during my research said that most binoculars over 20 years old do not compare with the current state of the optical art.***

So what to buy? Well, this month's president's corner is not meant to be a binocular buying guide, but rather the personal discovery into how far the experience of using binoculars for astronomical purposes has changed for this author. This is the direct result of purchasing a set of the Canon IS (Image Stabilized)

*The Canon 10 X 42 IS (Image Stabilized) binoculars.*

## Keeping Steady With Binoculars *(Continued from the previous page)*

binoculars that are spoken of so highly on many astronomy binocular forums. Simply, I found these binoculars a revelatory experience and to those of you who already have them and need no convincing, let me indulge my moment of enthusiasm!

These are simply quite extraordinary binoculars. At first light, as with most binoculars, you point to an astronomical object and usually "the shakes" lead to stars bouncing around the view unless you are lying on a recliner, and even then keeping the view steady requires a conscious effort. With the Canon IS binoculars, as soon as you press the stabilization button, suddenly everything becomes rock solid and steady. Star clusters resolve from bouncing clouds of stars to the finely resolved objects they really are. Very dim nebulae and galaxies that are difficult to separate from the background suddenly become highly apparent, as your averted vision remains stable in relation to the surrounding sky. I find the effect is like adding 50% more aperture to the binoculars notional aperture.

### *In engineering terms, these binoculars work by using what is called a Vari-Angle Prism.*

Inside there are two sensors that detect horizontal and vertical shaking respectively. The two Vari-Angle Prisms in both the left and right sides of the binocular are controlled by a processor that instantly adjusts the refraction angle of incoming light. On top of the binoculars there is a button that if you want to stop image shake, you just press and hold the button. The result is almost miraculous and a real leap in capability beyond traditional binoculars.

### *So what about the actual optical quality?*

Usually there is no free lunch and there have to be some compromises somewhere, but in the case of these binoculars I could not find any fault. In fact the 10 X 42's that I purchased have Canon's famous red line around each objective, the same as their premium DSLR camera lens, highlighting the fact that they use extra low dispersion optics to produce the crispest and most aberration free view possible. Simply the view is deep, contrasty, and superb. Agin though, it is the stable view that transforms the whole viewing experience and maximizes the quality of the optics. The only real downside I have experienced is that these binoculars require a battery to power the stabilization, and that the batteries tend to drain more quickly in the cold, not untypical for astronomical viewing at night. Also, at around $1,000 these binoculars are not cheap, but in my personal experience, they have completely revolutionized binocular viewing.

### *There are several different size IS binoculars and the 10 X 42's I purchased are the ones that appear to receive the most praise.*

There are higher powered and wide aperture 15 X 50's and 18 X 50 stabilized binoculars available as well,, though they have an increasingly narrow fields of view and because of that can be somewhat harder to locate targets. The 10 X 42's offer a wonderful balance between magnification and field size, providing the widest true field at the highest power for views with the best contrast and the most detail. They are also tough and waterproof. The instruction booklet actually tells you to wash them by dunking them in a bucket of water. (Not something I am going to do with my telescopes) I highly recommend them.

*The Canon 10 X 42's (left) next to the somewhat larger Canon 18 X 50's*

So having upped my game with these wonderful stabilized

## Keeping Steady With Binoculars *(Continued from the previous page)*

binoculars, what next? Well, we can all dream. How about these 12" triplet apochromatic binoculars?

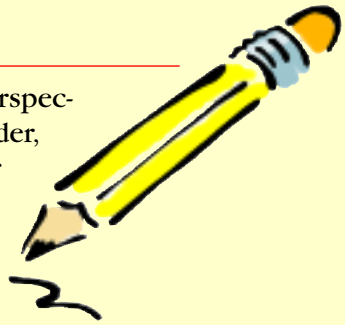
A pair of these binoculars only weighs just over a ton at 2,400 pounds so holding them while lying in a $59 back-yard recliner is not recommended. The Optics are APM-LZOS 304 mm F/7.5 triplet ED Lenses. This configuration of telescope tubes and bino rotating ring was made by Matthias Wirth in Germany for a buyer in China. The price? I suspect a case of "if you have to ask you can't afford it".

***Clear skies!***

*— Chris Ford*

*Your next binoculars? Only 300mm (12") in aperture each.*

## As Always Writers Are Wanted



We are always looking for new articles and content. If you have astronomical perspectives or experiences to share with your fellow members that you would us to consider, please feel free to contact me Chris (cford81@comcast.net) or our newsletter editor Vianney. (veloroute@hotmail.com)

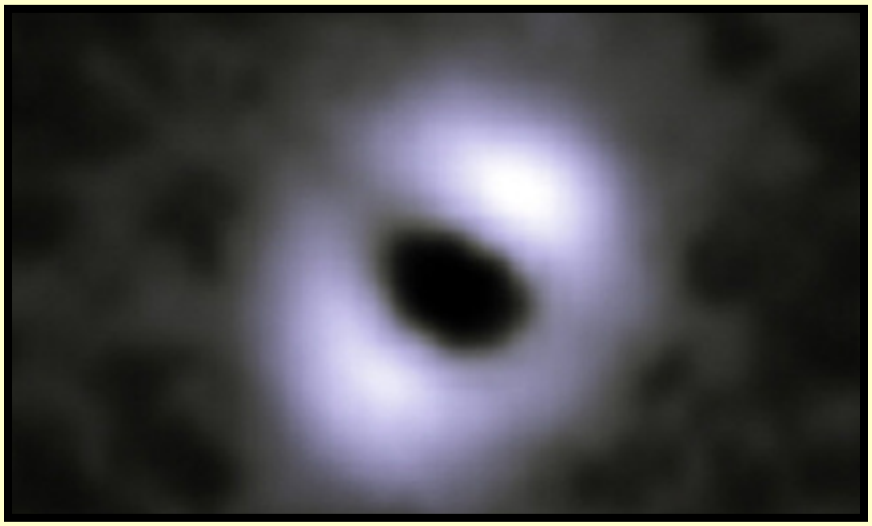
Clear skies!

*Chris and Vianney*

# Retired Star Found With Planets and Debris Disc

*by the European Space agency*

***ESA's Herschel space observatory has provided the first images of a dust belt – produced by colliding comets or asteroids – orbiting a subgiant star known to host a planetary system.***



*Dust disc around Kappa Coronae Borealis*

After billions of years steadily burning hydrogen in their cores, stars like our Sun exhaust this central fuel reserve and start burning it in shells around the core. They swell to become subgiant stars, before later becoming red giants.

At least during the subgiant phase, planets, asteroids and comet belts around these 'retired' stars are expected to survive, but observations are needed to measure their properties. One approach is to search for discs of dust around the stars, generated by collisions between populations of asteroids or comets.

Thanks to the sensitive far-infrared detection capabilities of the Herschel space observatory, astronomers have been able to resolve bright emission around Kappa Coronae Borealis (Î CrB, or Kappa Cor Bor), indicating the presence of a dusty debris disc.

The star is a little heavier than our own Sun at 1.5 solar masses, is around 2.5 billion years old and lies at a distance of roughly 100 light years.

From ground-based observations, it is known to host one giant planet roughly twice the mass of Jupiter orbiting at a distance equivalent to the Asteroid Belt in our own Solar System. A second planet is suspected, but its mass is not well constrained.

Herschel's detection provides rare insight into the life of planetary systems orbiting subgiant stars, and enables a detailed study of the architecture of its planet and disc system.

"This is the first 'retired' star that we have found with a debris disc and one or more planets," says Amy Bonsor of the Institute de Planétologie et d'Astrophysique de Grenoble, and lead author of the study.

***"The disc has survived the star's entire lifetime without being destroyed.***

That's very different to our own Solar System, where most of the debris was cleared away in a phase called the Late Heavy Bombardment era, around 600 million years after the Sun formed."

Dr Bonsor's team used models to propose three possible configurations for the disc and planets that fit Herschel's observations of Kappa Cor Bor.

The first model has just one continuous dust belt extending from 20 AU to 220 AU (where 1 AU, or Astronomical Unit, is the distance between Earth and Sun).

By comparison, the icy debris disc in our Solar System – known as the Kuiper Belt – spans a narrower range of distances, 30–50 AU from the Sun.

In this model, one of the planets orbits at a distance of greater than 7 AU from the star, and its gravitational influence may sculpt the inner edge of the disc.

## Scopes Are Needed!

***Friday April 12, 2013 from 7:45 p.m. to 9:00 p.m.***

Buena Vista Elementary Stargazing, Buena Vista Elementary, Walnut Creek, CA Setup 6:45 p.m.

***Saturday April 13, 2013 from 9:00 a.m. to 1:00 p.m.***

Mt. Diablo State Park Earth Day, Mitchell Canyon Visitor Center, Clayton, CA Setup 8:00 a.m

***Tuesday April 16, 2013***

Diablo View Middle School Stargazing, Diablo View Middle School Starparty, Clayton, CA

***Wednesday April 17, 2013 8:00p.m. to 9:00 p.m.***

Joaquin Moraga Middle School Stargazing, Joaquin Moraga Middle School, Moraga, CA Setup 7:00 p.m.

***Friday April 19, 2013 7:30 p.m. to 9:30 p.m.***

Adams Middle School Science Night, Adams Middle School Upper Field, Brentwood, CA Setup 7:00 p.m

***Saturday April 20, 2013 7;00 p.m. to 11 p.m.***

Public Astronomy Program, Mount Diablo — Lower Summit Parking Lot, Clayton, CA Setup 5:30 p.m.

*Pan-Starrs comet by John Read*

# Mount Diablo Astronomical Society Event Calendar–April 2013

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| 31 | 1 | 2 | 3 | 4 | 5 | 6 Society Observing (Private) Sunset: 7:37 PM |
| 7 | 8 Board Meeting (Private) | 9 | 10 Hillview Stargazing (Private) | 11 | 12 Buena Vista Stargazing (Private) | 13 Observatory Maintenance (Private) 9:00 AM MDSP Earth Day Sunset: 7:44 PM |
| 14 | 15 | 16 DVMS Stargazing (Private) | 17 Joaquin Moraga Stargazing (Private) | 18 | 19 AMS Science Night (Private) | 20 7:00 PM Public Astro: Alien Life Sunset: 7:51 PM |
| 21 | 22 | 23 7:15 PM GenMtg: Mars | 24 El Dorado Star Party (Private) | 25 | 26 | 27 Sunset: 7:57 PM |
| 28 | 29 | 30 6:30 PM Pleasant Hill Stargazing | 1 | 2 | 3 | 4 |

## Yosemite Star Party
## July 5th and 6th, 2013

# Board Members & Address

*President*
*Chris Ford - cford81@comcast.net*

*Vice President*
*Rick Linden - Rick.C.Linden@gmail.com*

*Membership Coordinator, Mtg Room*
*Marni Berendsen - berendsen@aol.com*

*Meeting Program Chair*
*Dick Flasck - rflasck@aol.com*

*Outreach Coordinator, AANC Rep*
*Jim Head - jamesnhead@comcast.net*

*Publicity Board Member*
*Steve Jacobs - llasjacobs@astound.net*

*Observing Committee Chair, Board Member*
*Richard Ozer - rozer@pacbell.net*

*Whats Up Coordinator, Board Member*
*Kent Richardson - kayarind@sbcglobal.net*

*Treasurer*
*Will Roberge - wil@donahue.com*

*Newsletter Editor*
*Vianney - veloroute@hotmail.com*

*Webmaster*
*Jon Steel - jonlee0483@aol.com*

*Secretary*
*Moon - Moonglow6@hotmail.com*

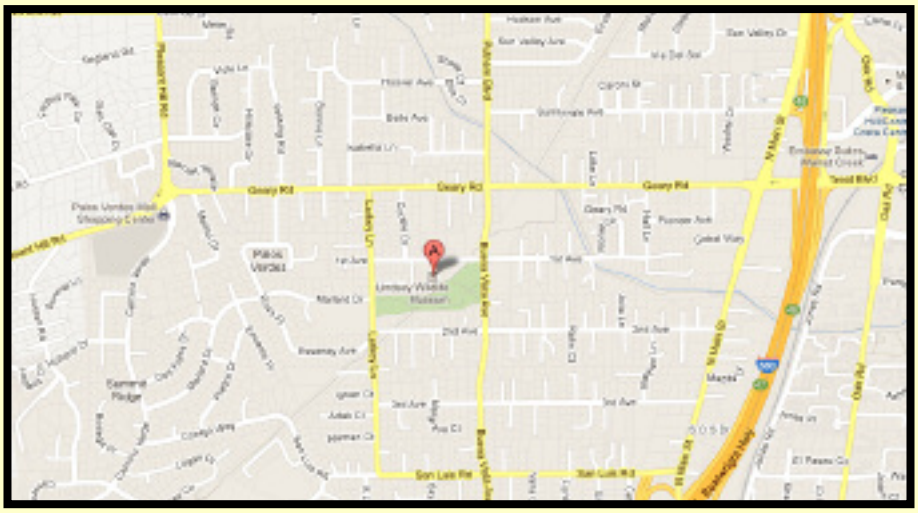
*New Member Steward*
*Nick Tsakoyias - claytonjandl@aol.com*

*Mailing address:*
*MDAS*
*P.O. Box 4889*
*Walnut Creek, CA 94596-3754*

*General Meetings:*
*Fourth Tuesday every month, except on the third Tuesday in November and December. Refreshments and conversations at 6:45 pm; Meeting begins at 7:15*

*Where:*
*Lindsay Wildlife Museum*
*1931 1st Avenue*
*Walnut Creek, CA 94597*
*(925) 935-1978*
*wildlife-museum.org.*

*Directions to facility:*
*From the North: Take 680 South to Treat Blvd. exit. Turn left at light onto North Main St. Turn right on Geary Road. Turn left on Buena Vista. Turn right on First Avenue. The museum is halfway up the block on the left.*

*From the South: Take 680 North. Take the Treat Blvd./Geary Road exit and turn left over freeway. Go three more lights and turn left on Buena Vista. Turn right on First Avenue. The museum is halfway up the block on the left.*

*Parking:*
*The museum is located in a residential area. There are no parking fees nor meters. Please park only in the museum parking lots on the east side of the museum, the Friends Church lot across the street (except Sunday mornings) or on Buena Vista Avenue. Please do not park on First Avenue in front of our neighbors' homes — you will get a parking ticket.*