diablo Moonwatch

Mount Diablo Astronomical Society

number 11 • november 2010 • www.mdas.net

Congratulations San Francisco Giants 2010 World Series Champions

Join the Party: MDAS Board Elections in December!

Nominations are now open. Please make your nominations by November 24th by contacting President Liede-Marie Haitsma (lunaLMH@gmail.com) or Vice President Chris Ford (cford81@comcast.net). Yes, you can nominate yourself (it's called "volunteering"). You are welcome to run for any office. Contact Liede-Marie or Chris for more information on any position.

We'd like to express a big THANK-YOU to Liede-Marie Haitsma for serving as our President for the last two years!

Here's the slate for 2011 so far:

- President: Chris Ford
- Vice-President: OPEN
- Treasurer: Wil Roberge
- Secretary: Malinda "Moon" Trask
- Newsletter Editor: Vianney Serriere
- "What's Up" Speaker Coordinator: Kent Richardson
- Main Speaker Coordinator: Dick Flasck
- New Member Mentor: Nick Tsakoyias
- Members-At-Large (3): Steve Jacobs, Jim Head, Richard Ozer

Have you taken your turn serving the club yet?

If not, here's your chance to lend a hand! We have several positions opening up in January and the person listed will be happy to show you the ropes and get you started. It only takes a few hours a month.

More MDAS service opportunities:

- Refreshments for the Monthly Meeting (contact Moon Trask for details: metallicamoon@sbcglobal.net)
- Astronomical Association of Northern California (AANC) Representative
  (Contact Jim Head for details jamesnhead@comcast.net)

The NT-200 Telescope, Lake Baikal and Neutrinos

President's Corner

Liede-Marie Haitsma

Lake Baikal is a fascinating lake in Southern Siberia, Russia. It contains one fifth of the planet's freshwater, which amounts to more than all of America's Great Lakes combined. The word "Baikal" is thought to be derived from Kurykan, a language spoken by the local people around 1,300 years ago, which means "much water." From an atlas, Baikal would appears as a crescent-shaped body of fresh water spreading 12,159 square miles (31,492 square kilometres) in area within Siberia near the Mongolian border. The lake is 393 miles (635 kilometers) long and on average, 30 miles (48 kilometers) wide – about the size of Belgium which makes it the ninth largest lake in the world. The lake is incredibly deep for its size. The depth of Baikal is around 5,380 feet (1,640 meters) to the floor and holds 5,500 cubic miles (23,000 cubic kilometers) of water. If the lake were completely emptied, a vertigo-inducing canyon over a mile deep would present itself. These proportions of the lake signify a violent geological past. Having been dated back to around 30 million years, it is the oldest in the world. It sits at the junction of tectonic plates which are slowly tearing Asia apart. This trench was originally 5 miles (8 kilometers) deep. Over time silt partially filled the trench, but seismic activities continue along the lake with frequent tremors and several hot springs. Scientists consider the lake to be a future ocean for it continues to widen at an astounding rate of about an inch (2.5cm) a year.

A neutrino is a subatomic particle that is very similar to an electron, but has no electrical charge and a very small mass, which might even be zero. Neutrinos are one of the most abundant particles in the universe. Because they have very little interaction with matter, however, they are incredibly difficult to detect. They are able to pass straight through the Earth without hitting anything. This has led some to dub them "ghost particles".

The NT-200 telescope does not point up to the cosmos but it was created to point down, into the water, to look for the most "elusive" fundamental particle called the neutrino. The Baikal neutrino detector in Siberia was the first of its kind, built in 1993. It made the first ever detection of an atmospheric neutrino in 1994 and started working at full power in 1998.

The telescope has to be in as dark and deep a place as possible and more than a kilometer of water in Baikal's clear abyss turned out to be a perfect solution. With arrays of photomultiplier tubes, the NT-200 telescope resembles an octopus. Underwater, the structure of 192 glass "balls" spans 42m in length and 70m in height. The tubes detect neutrinos by registering the intensity of Cherenkov light - electromagnetic radiation emitted when a charged particle passes through a medium, for example, water or air, at great speed.

For more information:

http://www.springerlink.com/content/a326187w36j473n1/

http://www.bbc.co.uk/news/science-environment-11384614

http://windowstorussia.com/lake-baikal-deep-underwater-telescope.html

http://discovermagazine.com/2010/mar/15-ice-fishing-for-neutrinos-from-middle-of-galaxy

Night Sky Network
Astronomy Clubs bringing the wonders of the universe to the public

How to Get "Wow" When You're Not Showing Saturn

MDAS November Meeting: What's Up?

Marni Berendsen

Did you know:

- Our club is a member of the NASA Night Sky Network?
- That it offers free services to help us run our club?
- How you can take advantage of its support & training for the public outreach we do?

Find out what's new and how to learn more about astronomy, as well as enhance the stories you tell at the telescope. All for free.

Got Vounteer Hours ?

Be sure to log your volunteer hours serving the club and at our outreach events. It helps us to keep track of who is contributing to the club and allows us to properly recognize our dedicated members!

It also allows you to keep track of mileage driven for tax purposes.

How to log your hours and mileage:

1. Log into our club on the Night Sky Network: http://nightsky.jpl.nasa.gov/login.cfm
2. Select "**My Volunteer Hours**" under the heading of "**My Member Information**"
3. Put a check mark in the box (left-hand column) that says "**Include Events for which I have not entered volunteer hours**" and press Search.
4. Look for the events in the list where you helped out and press "**Add**" under Volunteer Hours.

Hands-on Astronomy by Jeff Adkins

Main Speaker

Dick Flasck

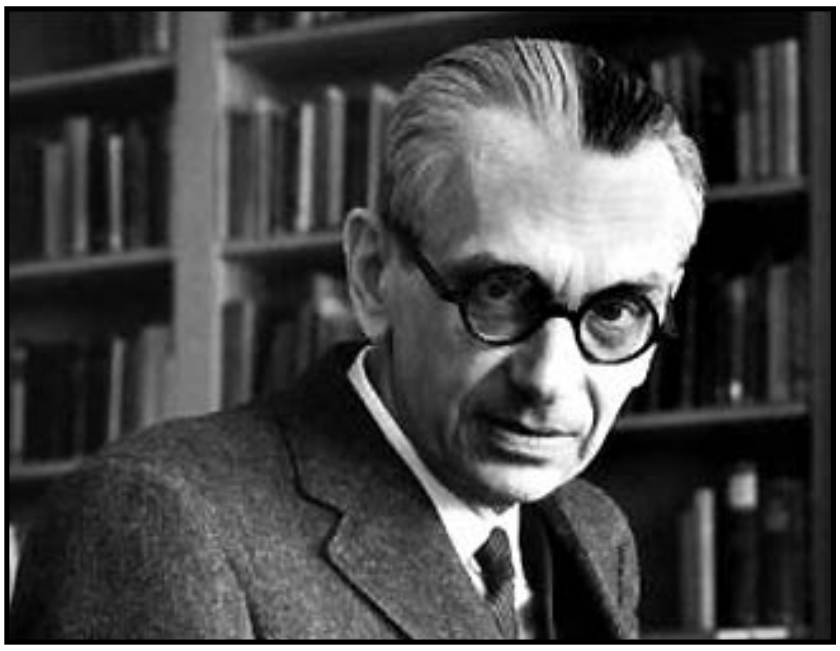
Our speaker for November 2010 is our own award winning Jeff Adkins! In this presentation you will be given some quick and easy activities you can do yourself and share with others, and about how to communicate basic ideas in astronomy. Topics include circles, the value of pi, a sun-pointer, finding the diameter of the sun using a pinhole, and more. As a bonus a planisphere and Galileoscope with tripod will be given away as door prizes.

Jeff Adkins is deeply involved in many astronomy and physics educational projects. In addition, he is an astronomy teacher at Deer Valley High School and Los Medanos College. He is also a NASA Astrophysics Educator Ambassador, director of his schools Science Research Academy, and the author of a workbook, Conceptual Astronomy I, and a novel, "The Boy Who Skipped."

Relativity and Time Travel

Nathaniel Bates

Time travel is a dream of science fiction buffs. Most Physicists believe that it is a pipe dream, given the Second Law of Thermodynamics. The Second Law states that disorder in the Universe will always increase with time. Increasing disorder defines what is called the "arrow of time" which cannot be reversed without violating laws of probability. In addition, Quantum Physics seems to disallow time travel given that such travel appears to violate the Uncertainty Principle. However, it has never been proven conclusively that time travel absolutely could not exist. In particular, both Newtonian and Einsteinian Physics seem to allow for the possibility of time travel. Even Quantum Physics allows for the concept of "many universes," which could allow for time travel without violating the Uncertainty Principle.



Leaving aside the infamous paradoxes around time travel, Relativity does allow for the possibility of backwards travel through time. Relativistic travel back in time was first considered by a good friend of Albert Einstein, the brilliant and eccentric logician Kurt Gödel. Kurt Gödel was not a Physicist, but he was well respected in intellectual circles given his profound discoveries in mathematics. In particular, Gödel delivered a stunning blow to mathematical Formalism when he proved that any attempt to boil mathematics down to a simple system of axioms would be incomplete. Gödel, a mathematical Platonist, believed that Mathematics was part and parcel of a higher reality just as the ancient Greeks did. Gödel did not delve much in to Physics, but he did make one important contribution to Relativity, the idea that an orbiting object moves back in time if it accelerates to speeds close to the speed of light. To understand Gödel's brilliant leap of logic, it is necessary to understand how Gödel's friend Albert Einstein opened the possibility of future time travel.

According to Einstein's theory of time dilation, proven beyond any shadow of a doubt by experiment, time is not constant. Rather, the fabric of space and time are themselves bendable while the only constant is the speed of light. Einstein built his notions of Relativity on the ideas of classical physicists like Faraday, Michelson/Morley, and Gauss. Crucial to his departure from classical physics, however, was the fact that Einstein made the speed of light absolute in any frame of reference. A light beam will always travel at the speed of light with respect to any object observing it, no matter what the speed of that object might be. Astonishingly, if a rocket ship accelerates to a speed close to that of the speed of light and travels to Alpha Centauri for a round trip, that ship would make it there and back in, let's say about ten years. If we shine a light in the direction of Alpha Centauri, that light would make it there in approximately 4.37 years. The ship would make it there in about 5 years, and then back in about ten years. Nothing surprises us here.

Einstein added one twist to the whole picture. Einstein posited that the observer on Earth and the observer in the rocket ship would both measure that same light beam as traveling the same speed! In other words, we on Earth would measure light as traveling slightly more than 186,000 miles per second. Yet, the observer on the rocket ship would also measure that same light beam as traveling 186,000 miles per second, even when common sense would seem to suggest that the observer on the rocket ship would see the light as traveling much slower with respect to herself. In order to preserve the speed of light as an absolute constant in all frames of reference, Einstein had to view space and time as less than absolute. Time on board an accelerating rocket ship would pass at a slower rate than time would on Earth. If we were to measure the time it took for the rocket ship to make the round trip, we would measure ten years but the passengers on board the ship would experience possibly as little as a year. This would not be mere perception. Even an atomic clock on board ship would come up with a measurement of time much less than ten years while we would measure ten years.

Space and time on board the rocket are altered by the acceleration of the rocket. This result shocked the world, and it has been repeatedly confirmed by experimentation. Yet, Gödel added one more twist to the whole plot. Gödel added the possibility of time travel to the past! His model was simple. If an object orbits around a center point at a speed near the speed of light, the object in rotation will experience time dilation. Gödel's calculations showed that such time dilation would actually allow the object to travel backwards in time. The reason has to do with the fact that time dilation is only in the centrifugal direction, not through the center. Time travel was possible mathematically, even though it has never been verified experimentally. Gödel went ahead and posited that Universe itself was rotating, but cosmologists have never gone along with that one. Still, no one could disprove Gödel's equations allowed for time travel. The possibility of an object orbiting something gravitationally massive such as a superstring and then traveling back in time was even explored in a Star Trek episode a while back.

Time travel may be possible, or it may violate causality, but it still excites the imagination. Kurt Gödel's name may not be as well known as Einstein's, but both men discovered truths about space and time that continue to excite the imaginations of scientists and science fiction buffs alike.

A Short Look at Arthur C. Clarke's Philosophy

Jim Scala

I miss Arthur C. Clarke who was a prolific author of scientific articles, nonfiction books and fiction. But he is most widely known for his science fiction. Most people are familiar with the epic-classic movie 2001 A Space Odyssey. which is based on his short story The Sentinel. Many scientists including the late Carl Sagan were Arthur C. Clarke fans. Indeed, Clarke armed with an excellent education in physics was best described as a futurist, who extrapolated current scientific discoveries.. He also had a fundamental belief in the human spirit and this philosophy worked its way into everything he wrote.

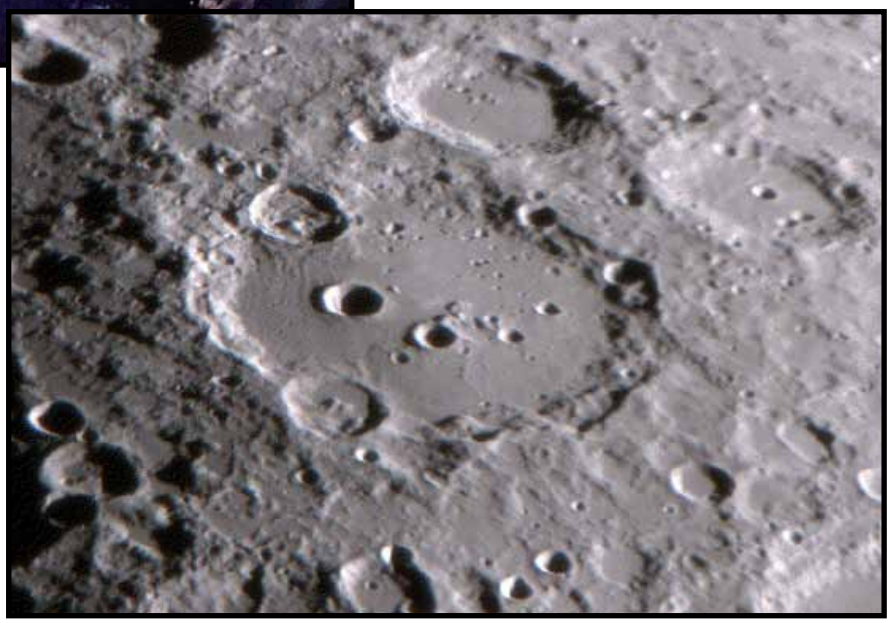
A spaceship leaving the permanent space station in 2001 as envisioned by Arthur C. Clarke and Stanley Kubrick. The space ship went on to Clavius Base where Clarke envisioned a permanent base by 2001. Will it ever be?

A question illustrates Clarke's optimism.

Shortly after 2001 A Space Odyssey appeared in late 1968, Arthur C. Clarke was the Sigma Xi lecturer and I, along with about 10 others was invited to a small pre-lecture luncheon. I asked him some burning questions beginning with, "In several interviews you said we would detect alien intelligence by 1999. How did you decide 1999?" He explained that by 1980 we would have a large radio telescope array dedicated to SETI and we'd surely detect a signal in less than 10 years; then allow five years to verify and get agreement, so 1999 is safe. "So," he followed, "I simply left myself some wiggle room." Knowing how difficult it is to get esoteric projects funded I thought, "Boy, this guy is an optimist."

I shifted my questions to the movie, 2001 and asked if he really believed we could have a lunar base, by 2001 in 1968 that was 3 decades in the future. He agreed that 2001 was an optimistic concept, but felt we'd have a small, but growing outpost on the Moon by then.

Since I support manned exploration he boosted my enthusiasm for the future. We then discussed the concepts expressed in 2001 and he clarified some of the symbolism he expressed through the motion picture eyes of Stanley Kubric. You have to see the movie to understand the symbolism.



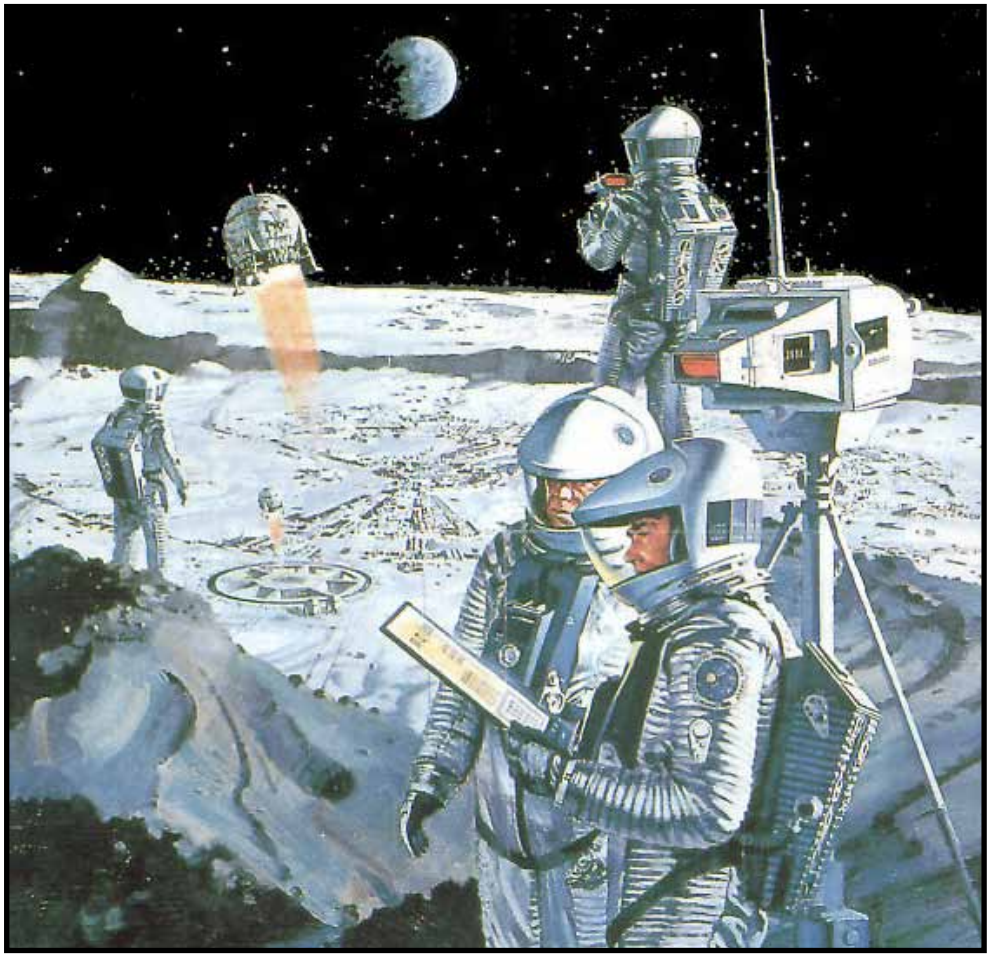
Clavius Crater as it would appear through a four inch telescope. At 225 KM Clavius is really a "walled plain" even though Clarke referred to it as a crater.

Four decades after that luncheon I realize that Clarke was an optimist. Will astronauts step on the Moon again before 2020? We thought SETI would supposedly be running at top speed in 2010 when the Allan Array was due for completion, but to say it's stalled doesn't quite describe its grim situation. Clarke himself became less optimistic about discovering extraterrestrial intelligence and his book, 3001. The Final Odyssey, filled with science that would appear like magic to us man hadn't yet detected alien life. However in an usual stellar explosion – a nova - he proved he still had hope for intelligent alien life.

The Space elevator illustrates the science in Clarke's science fiction?

Arguably, Clarke's most esoteric concept in was the space elevator. In its simplest form, a ship in a precise stationary orbit above a planet drops a cable to earth which allows things to be raised and lowered into and out of space. In 1990 Richard Smalley headed a Rice University chemists group working on Buckminster Fuller's carbon chemistry concepts and linked 60 carbon atoms together in an unusual tubular arrangement. The structure they produced has higher tensile strength than diamond! Not surprising, when Dr. Smalley won the Nobel Prize in chemistry he said, "This material would make Arthur C. Clarke's space elevator concept possible."

This space elevator appears in Clarke's books and in The Songs of Distant Earth he even described an accident that could occur which he went on to illustrate a rather unusual problem our modern medical science is creating for future citizens. On the other hand it makes all kinds of interesting applications possible; not the least of which is cheap space travel.



Space ship landing on Clavius Base as envisioned by Arthur C. Clarke. Will this ever be?

Did our conversation influence Clarke in 1968?

At the luncheon that day, I managed to ask why he seemed to ignore Fermi's paradox He explained that he didn't believe that von Neumann's robotic concepts were realistic; hence Fermi was wrong. Rather, he said that intelligent beings would segue immediately into information exchange via radio and not bother with travel even by machine. Other scientists at the luncheon proposed concepts of "informational von Neumann probes." The overall consensus at the luncheon was that we still have to listen. Like Fermi they all though we sould have received some evidence by 1968 in spite of ourselves.

I like to think that the luncheon consensus and others like it influenced him into learning more about the possible abundance of intelligent life because after that his writings took two diverging directions. In the Rama series he explored the many forms alien life could take including widely varied means of communication. In most of his other books and short stories he introduced life; especially in the Rescue Mission. In this, nearly his last short story he brings out his unabashed belief in mankind's incredible resiliency and our ability to overcome just about any challenge that nature can toss our way. In this story, he managed to introduce one more scientific extrapolation; the transoceanic "vacuum" tunnel which some scientists are already planning and Norway is considering seriously.

Give this a try and enjoy yourself.

Rent the movie 2001: A Space Odyssey, and then rent 2010: The Odyssey Continues and let your imagination wander.

Astro Classifieds

1986 - Meade 2045
4" Schmidt Cassegrain Telescope

I am helping my friends sell a telescope for her friend: This telescope is the forerunner of the ETX model, but it is constructed with mostly metal parts. I have never used it, but I have downloaded a few old reviews. One person said the 2045 is a poor man's Questar! In 1986, the telescope's cost was approximately $500 without the T-Adapter, Lumicon, Orion & Meade sunshade accessories and books.

The telescope comes with the following accessories;

a. 9 mm and 25 mm eye pieces;
b. Eyepiece holder/diagonal prism;
c. 5 x 24mm view finder;
d. 126 - 2x telenegative amplifier (Barlow)
e. 3 thread-in tripod legs for setting onto a table;
f. T-Adapter for astronomical photography;
g. Lumicon illuminated k.12 mm eyepiece;
h. Lumicon 211 Research Drive w/cables;
i. Lumicon switch pod;
j. Orion erecting prism;
k. Meade 582 sunshade
l. AC power cord;
m. Very sturdy aluminum carry case;
n. Meade Operating Instructions;

Books:

a. Astrophotography - A step by Step Approach by Robert T. Little, 1986;
b. Astrophotography 2nd edition by Barry Gordon, 1983;
c. Scientific America - The Planets, 1983
d. Sky Catalogue 2000.0, volume 1, 1982
e. Sky Catalogue 2000.0, volume 2, 1982
f. Star Map for Beginners by Levitt & Marshall

Misc:

a. Rangematic Distance Finder
b. Leather wrapped 1 3/8" Antique telescope (?) extends to 23 ½" made by Ross, London
c. **If you are interested in any of these items, please call Leary Wong and we can discuss prices - (925) 930-7024**

Cool Astro Links

Night Sky Network: Club Member Login
http://nightsky.jpl.nasa.gov/login.cfm

Night Sky Network: Astronomy Clubs
http://nightsky.jpl.nasa.gov/

Astronomy Picture of the Day
http://antwrp.gsfc.nasa.gov/apod/

NASA - Home
http://www.nasa.gov/

Jet Propulsion Laboratory
http://www.jpl.nasa.gov/

ESA Portal
http://www.esa.int/esaCP/index.html

JAXA | Japan Aerospace Exploration Agency
http://www.jaxa.jp/index_e.html

Main Hubble Page
http://hubble.nasa.gov/

HubbleSite:
Out of the ordinary...out of this world
http://hubblesite.org/

Universe Today
http://www.universetoday.com/

Bad Astronomy
http://blogs.discovermagazine.com/badastronomy/

SpaceWeather.com: News and information about the Sun-Earth environment
http://www.spaceweather.com/

Cloudy Nights
http://www.cloudynights.com/

Astromart
http://www.astromart.com/

The Planetary Society
http://www.planetary.org/home/

Astronomical Society of the Pacific
http://www.astrosociety.org/

AANC: Astronomical Association of Northern California
http://www.aanc-astronomy.org/

Mount Diablo Astronomical Society
http://www.mdas.net/

Astro Classifieds

I have a **Konusmotor 114** (4.5", 900mm, f/8) equatorial reflector telescope with tripod available for sale. I got it in August 2008, but have never set it up or used it.

After attending some star parties, I realized rather quickly that I was more interested in stargazing with the naked eye.

I wonder if anyone might be interested in purchasing it.

Thanks for your help.

Nancy Brown - ndowdsbrown@hotmail.com

Rubylith, red, clear, transparent, huge 24" x 36" sheets. For flashlight lens, laptop covers, car lights, etc.

$5.00 per sheet, can be picked up at my home in Oakland, or at an EAS or MDAS meeting or viewing night that I attend.

But if you want shipping, you have to order here:
http://dragonflybridge.com/Rubylith/

Jon Steel
510-531-6218
jonlee@aol.com

MDAS Meetings and Viewing Events in November 2010

< Novemb			
Sunday	Monday	Tuesday	Wedn
31	1 7:30 PM Board Meeting	2	
7	8	9 7:00 PM MDAS Imaging SIG	
14	15	16 7:15 PM GenMtg: NASA Education	7:00 PM S Valley Le
21	22	23	
28	29	30	

ber 2010 >			
esday	Thursday	Friday	Saturday
3	4	5	6 Society Observing Sunset: 6:05 PM 
10	11 Veterans Day	12	13 Society Observing Sunset: 4:59 PM 
17 Silicon ctures	18 6:00 PM NSN Telecon	19	20 Sunset: 4:54 PM
24	25 Thanskgiving Day	26	27 Sunset: 4:51 PM
1	2	3	4

Mount Diablo Astronomical Society
P.O. Box 4889
Walnut Creek, CA. 94596-3754