

diablo Moonwatch

Mount Diablo Astronomical Society

number 7 • july 2010 • www.mdas.net



NGC 602 and Beyond

Credit: NASA, ESA, and the Hubble Heritage Team (STScI / AURA) - ESA/Hubble Collaboration

Near the outskirts of the Small Magellanic Cloud, a satellite galaxy some 200 thousand light-years distant, lies 5 million year young star cluster NGC 602. Surrounded by natal gas and dust, NGC 602 is featured in this stunning Hubble image of the region. Fantastic ridges and swept back shapes strongly suggest that energetic radiation and shock waves from NGC 602's massive young stars have eroded the dusty material and triggered a progression of star formation moving away from the cluster's center. At the estimated distance of the Small Magellanic Cloud, the picture spans about 200 light-years, but a tantalizing assortment of background galaxies are also visible in the sharp Hubble view. The background galaxies are hundreds of millions of light-years or more beyond NGC 602.

The Dawn of Creation: The First Two Billion Years

MDAS July Meeting - Main Speaker

Marni Berendsen

The beauty of the universe, the galaxies, clusters of galaxies, and most of the stars, got its start in the first billion years after the beginning of time, the Big Bang. Every deep picture of the sky reveals thousands of these galaxies, each made up of billions of stars like the Sun.

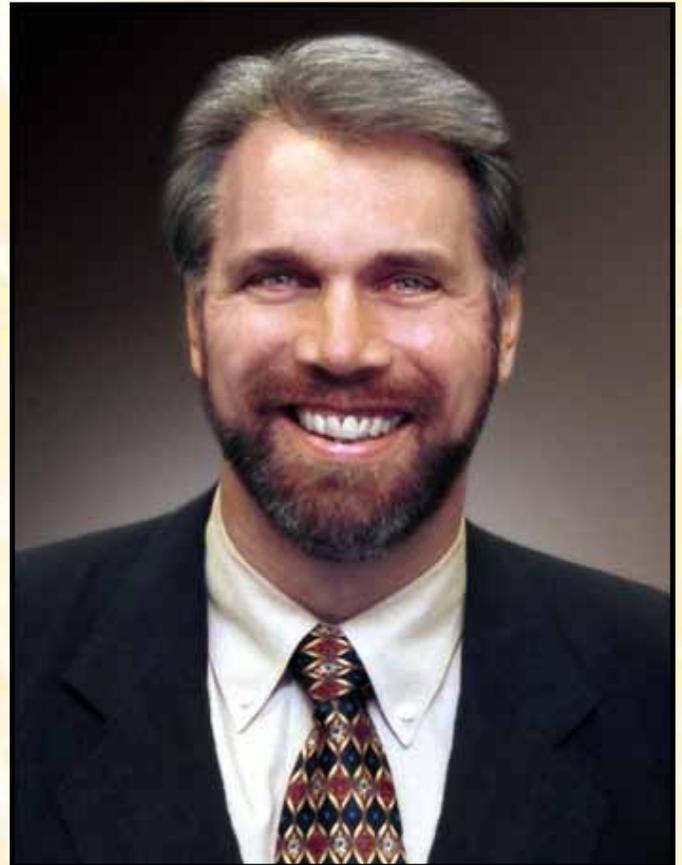
But did the universe always look like it does today? If we could have been there to witness it, what would the universe have looked like in its infancy?

Join us on Tuesday, July 27th when **Dr. Steven Beckwith** will take us back to when the first galaxies were created and the universe started to develop the structure that has resulted in the patterns of galaxies we see today.

Modern technical wonders like the Hubble Space Telescope have made it possible to look back to a time when the universe looked very different than it does today. The intricate spiral structures of the Milky Way as well as the very smooth distributions of the larger elliptical galaxies took shape slowly, building up from many pieces in the detritus of the initial explosion. This development was governed by the dark matter that we can sense but still not see.

Dr. Steven Beckwith is the Vice President for Research and Graduate Studies for the University of California's ten campuses, and he is the immediate past Director of the Space Telescope Science Institute. His 30-year research career spans a wide spectrum of interests including the formation and early evolution of extra-solar planetary systems, the evolution of young stars, and the birth of galaxies in the early universe. In 2004, he led the team that created the Hubble Ultra Deep Field, the deepest visual image of the universe, resulting in the discovery of the most distant galaxies ever seen.

Mark your calendar for July 27th: Don't miss what is certain to be an exciting trip back to our beginnings!



Dr. Steven Beckwith

For more information:

Johns Hopkins University

<http://physics-astronomy.jhu.edu/people/faculty/svwb.html>

University of California Office of Research

<http://www.ucop.edu/research/beckwith.html>

Space.com – Q&A with Hubble's Biggest Booster

http://www.space.com/business/technology/050307_beckwith_interview.html

Upcoming programs:

August 24: Dr. Thomas Berger of Lockheed Martin Solar and Astrophysics Laboratory

"Close-up of the Sun: Newest images from the Solar Dynamics Observatory"

Shedding a Little Light on Dark Energy

MDAS July Meeting - What's Up?

Frank Serduke

Mysterious stuff, this Dark Energy. Current data remain fully consistent with Dark Energy as a constant ... the "Cosmological Constant" symbolized by the upper case Greek letter Lambda. Depending on whom you believe, the theoretical "vacuum energy" density of the universe that is the obvious physical candidate for Dark Energy is somewhere between 57 and 128 orders of magnitude larger than the data; "a bone in the throat of theoretical physics", according to Physics Nobelist Steven Weinberg. The true nature of Dark Energy will not be revealed in this talk; if it were, the title would have been very different.

We will make and examine a plot that shows at the interplay between Dark Energy and Matter over much of the history of the universe. It will made clear why we now live in an epoch of accelerated expansion and why this was preceded by a time of decelerated expansion. It is my fondest hope that, at the end, you will say, "Oh, how about that?. I didn't realize it was that simple."

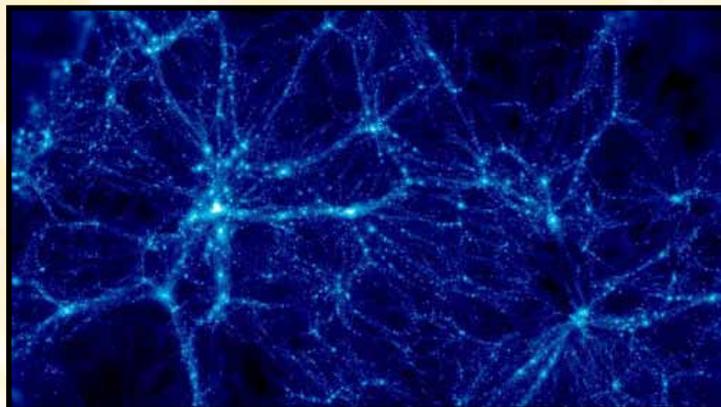
For more information:

Dark Energy, Dark Matter

<http://science.nasa.gov/astrophysics/focus-areas/what-is-dark-energy/>

Dark Energy - Introduction

http://imagine.gsfc.nasa.gov/docs/science/mysteries_l1/dark_energy.html

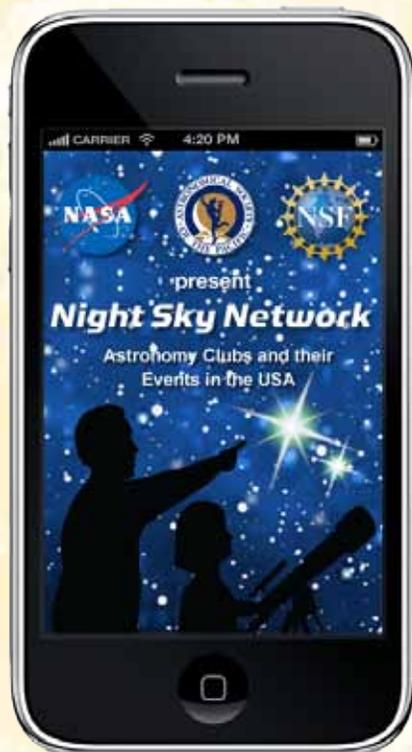


Night Sky Network

Astronomy Clubs bringing the wonders of the universe to the public

Free Night Sky Network iPhone App is Coming Soon!

Marni Berendsen



Did you know several members of MDAS were involved in the beta test of the soon-to-be-released iPhone App that is a portal to NASA Night Sky Network clubs and public astronomy events nationwide?

The Astronomical Society of the Pacific (ASP) thanks MDAS for helping with this vital step in the development of the App. The ASP manages the Night Sky Network for NASA.

Features of the App:

- Designed for use by the public
- Find astronomy clubs & events near your current location or anywhere in the USA
- Find upcoming public astronomy events for the next six months
- Get directions to events from your current location
- Contact an astronomy club
- Check the phase of the moon, sky map, weather report for each event

Watch for the announcement of this free iPhone App before the end of summer.

Solar Sailing Update: Japan's Ikaros Solar Sail

President's Corner

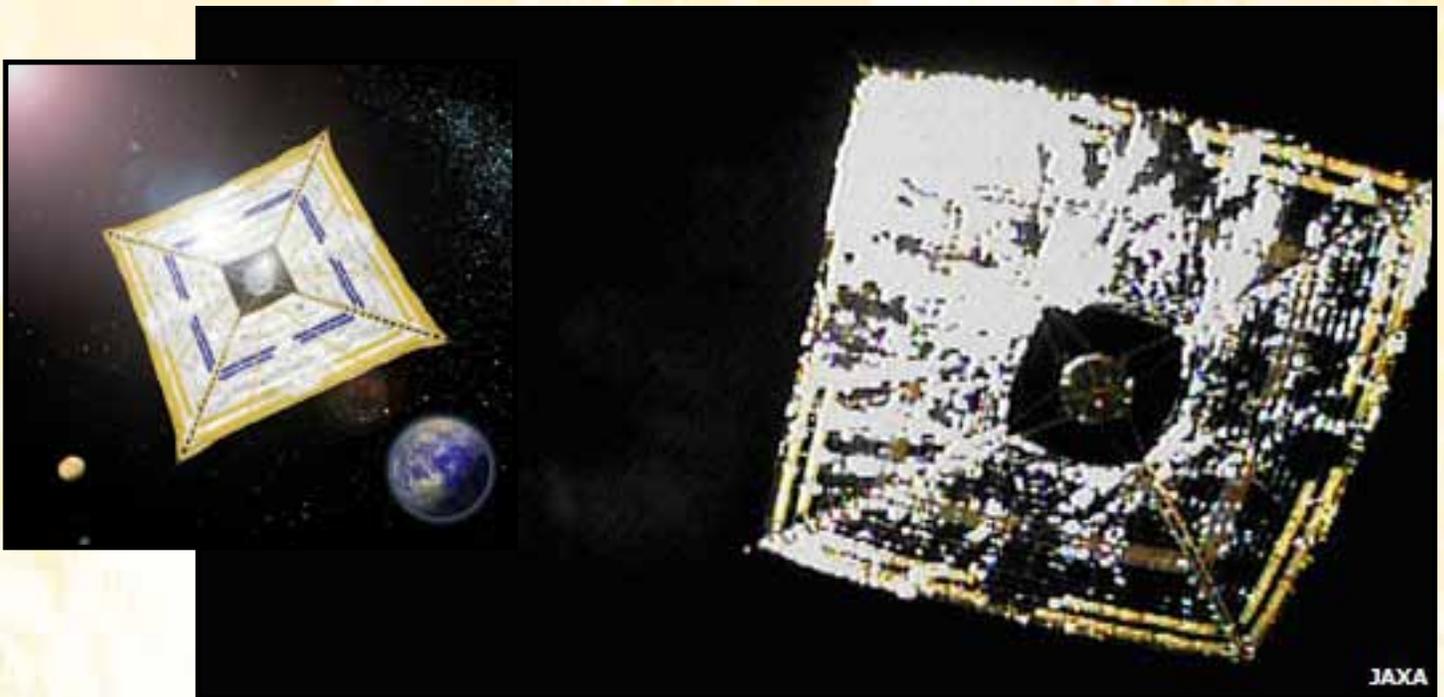
Liede-Marie Haitsma

In a prior President's Corner this year I wrote about the LightSail 1 that is being developed with the aid of The Planetary Society. It was to be launched at the end of 2010 but now seems to be set for the second quarter of 2011.

On June 10th Japan's Aerospace Exploration Agency (Jaxa) confirmed that the solar sail, Ikaros, deployed on June 3rd had expanded successfully, and that some thin-film solar cells embedded in the membrane were even generating power. This occurred 7.7 million km from Earth. The image of the extended solar sail was acquired by a tiny camera ejected from the central hub of Ikaros, and it transmitted the image back to the central hub of the spacecraft, Akatsuki, which then relayed the data back to Earth.

Ikaros is 2,100 sq ft of membrane attached to a small disc-shaped spacecraft that was launched May 21st by an H-IIA rocket, Akatsuki. "Ikaros will demonstrate the principal of using sunlight as a simple and efficient means of propulsion." It will be watched to see if it produces measurable acceleration, and how systems are able to steer the sail through space.

The solar sail was a piggy-back payload to Japan's Venus orbiter, Akatsuki. The launch took place from the Tanegashima Space Center. Akatsuki will arrive at Venus in December (2010); Ikaros will pass Venus.



For more information:

Ikaros Project

<http://www.jspec.jaxa.jp/e/activity/ikaros.html>

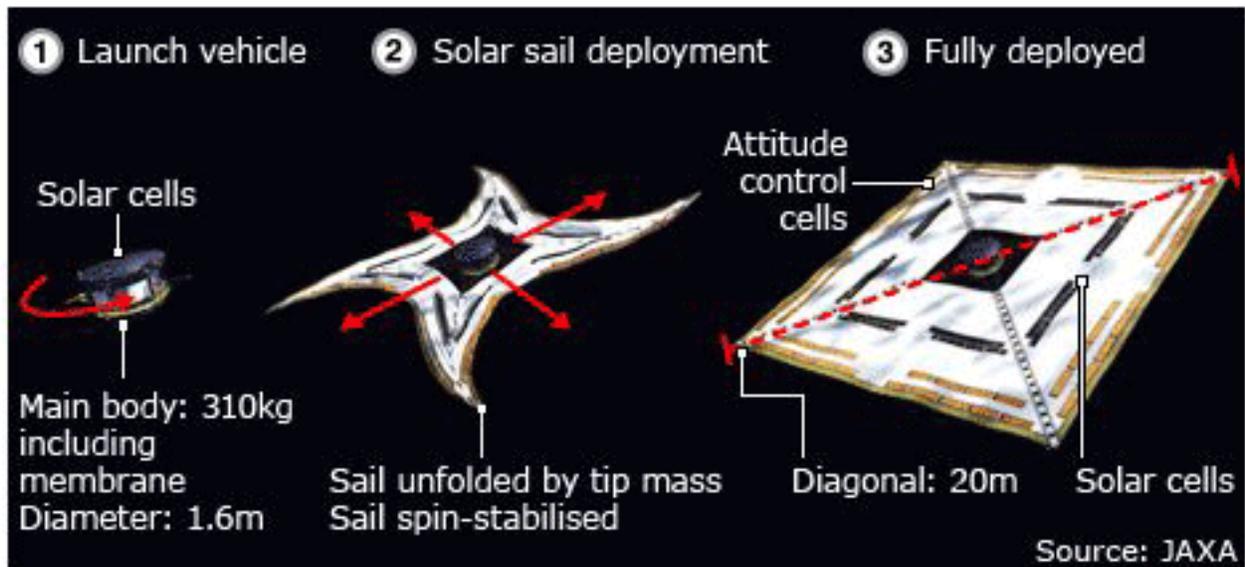
Ikaros - The Planetary Society

<http://www.planetary.org/explore/topics/ikaros/>

Separation Camera Takes Full Images and 'Movie' of IKAROS Solar Sail

<http://www.universetoday.com/2010/06/16/separation-camera-takes-full-images-and-movie-of-ikaros-solar-sail/>

SAILING TO VENUS - HOW IKAROS UNFURLED ITS SOLAR SAIL



- (1) For the deployment, the disc-shaped Ikaros spacecraft was first spun up
- (2) The four weighted corners of the sail were then released and flew outwards
- (3) Finally, the packed sail membrane was liberated and pulled flat by the rotating tips

Have You Tried the Moon Zoo Yet ?

Marni Berendsen

The Moon Zoo is a citizen science project and the goal is to provide detailed crater counts for as much as the Moon's surface as possible. In particular, you're asked to look for craters with boulders around the rim. The speakers at our May MDAS meeting gave us a detailed introduction. It's easy to get started - so sign up today! <http://www.moonzoo.org/>

See the Moon like never before

MOON ZOO

Launch

Welcome to Moon Zoo

Welcome to Moon Zoo — with your help, we hope to study the lunar surface in unprecedented detail.

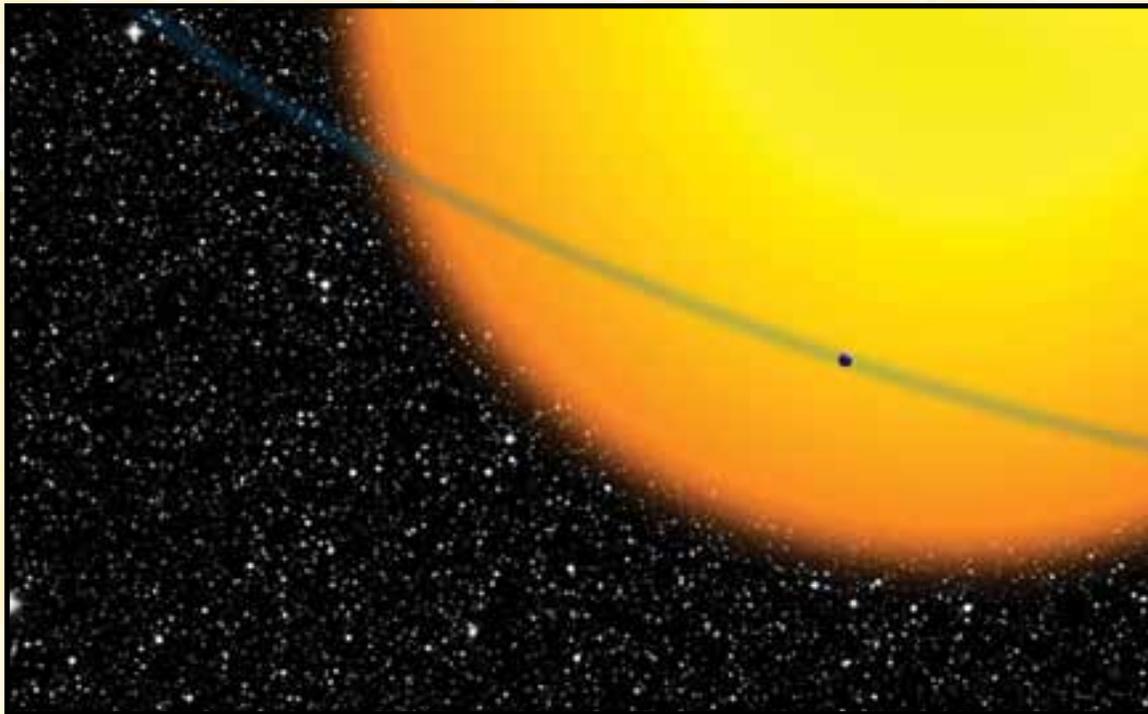
Kepler's Early Findings: Don't Write Off GJ1214-b !

Jim Scala

Our quest to end our cosmic loneliness is alive and well. It's led by the Kepler spacecraft that continuously stares at about 156,000 stars in the constellation Cygnus looking for a telltale light drop that says, "A planet is passing by!" Indeed, a list of 350 newly suspected stars that have one or more planets has already been released. Since thorough earthbound astronomy we already know of 461 planets that brings known extra solar planets to 811! But there's more, Kepler scientists are holding back on the best 400 candidates for further investigation before release.

An artists view of a planet in transit as viewed through the Kepler Telescope

Holding back, or more appropriately, weeding out the false positives makes sense when you think about the time lost and scarce research dollars that are lost tracking down false leads. Recognize that the list started with 12,000 small, albeit suspicious, light dips which was whittled to 956 possible planets by some hard work you can begin to understand why Kepler scientists want to weed out false positives... These can be caused by star spots, unusual double and triple stars and other imposters that aren't caused by plan-



ets. However, that left 956 candidates of which 204 were false positives. If the numbers seem a little confusing it's expected because there are still over 400 light dips in the uncertain category. It'll be partially resolved in 2011 when there'll probably be more candidates and the over 400 that are still uncertain will be released for other scientists to work on.

It appears the Kepler data says, "Be patient, we'll keep you informed." To be sure a planet is an Earthlike planet several things have to fall into place. It must be in what is the star's habitable zone and it should be monitored for several orbits. Look at it this way, if there's an alien Kepler watching our Sun and they saw a light dip, they'd need a couple more years to understand Earth's orbit and to have a feeling for its size. Besides they'd also have to sort it out from sunspots and the other solar planets that could pass in front of the Sun. After about two years they could say, "We've found a good candidate." Then other scientists could start processing all the data and hopefully after another year they could announce with certainty Earth's existence. All in all it could have taken about four years. We've simply got to give Kepler more time, but we know for certain that it's working up to our expectations and possibly even exceeding them.

continued on next page...

For more information:

Kepler: Home Page

<http://kepler.nasa.gov/>

The Carl Sagan Portal

<http://www.carlsagan.com/>

Gliese 581c

<http://www.universetoday.com/guide-to-space/extrasolar-planets/gliese-581c/>

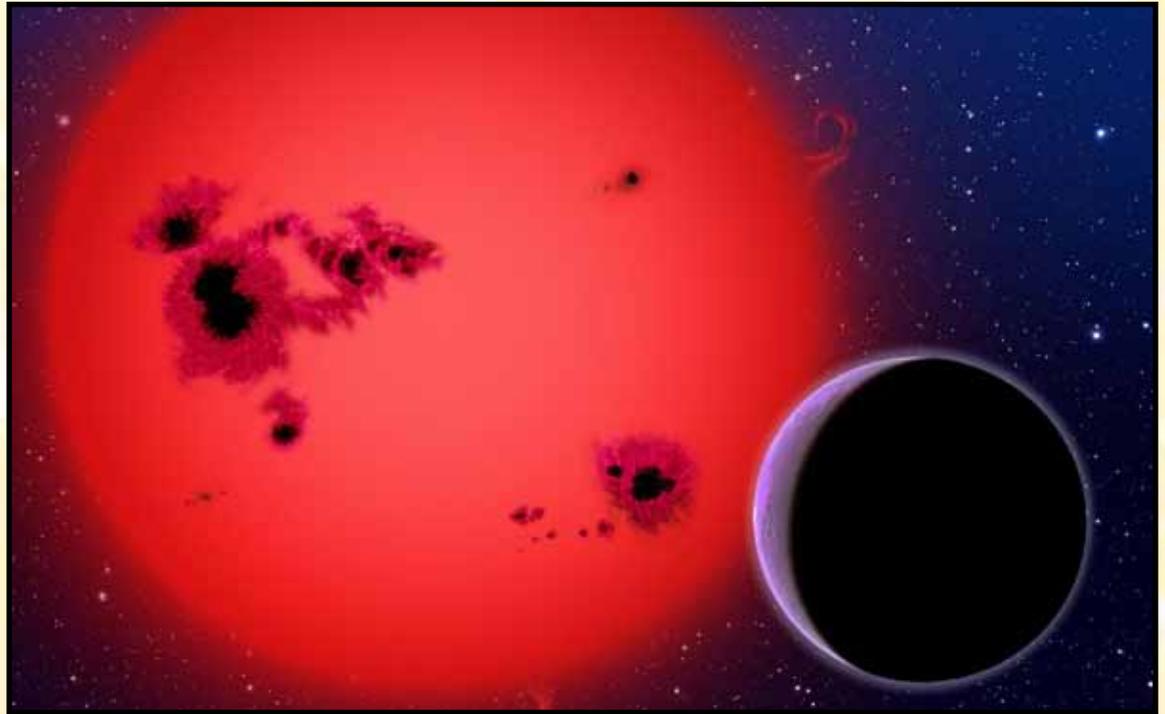
Astronomers Find Super-Earth With An Atmosphere

<http://www.universetoday.com/2009/12/16/astronomers-find-super-earth-with-an-atmosphere/>

Have we forgotten GJ1214-b?

Gliese 581-c and GJ1214b as imagined by an artist.

Last December a paper in Nature announced a planet orbiting inside the habitable zone of Gliese 581c a star only 40 light years away. I got excited because in the mid to late 1970s when people like Frank Drake and Carl Sagan were whipping up enthusiasm for planetary searches Gliese 581c was mentioned as a sufficiently solar like star to consider. When I saw the Nature paper I wished that Carl Sagan could have lived to read the announcement. But, my hopes were somewhat dashed when its senior discoverer, David Charbonneau of Harvard said, "It's a hot Earth; Indeed, it's a hot water planet twice the size of Earth." He continued, "So, don't expect it to harbor life unless it can live in a hot 284° ocean." Its radius is about 2.3 Earth's and its mass is about 6.6 times Earth's. However, as I read Charbonneau's and his 17 other colleagues' paper I thought, "Not so fast, knowing what we do about Earth's life the file on GJ1214-b remains open."



The planet would have an atmospheric pressure many times Earth's which would prevent its hot oceans from boiling. So, GJ1214-b is a gigantic Europa, but instead of its 100% planet covering ocean being ice covered it would be water covered with no land poking through. Indeed, it's a true water covered rather hot rocky planet. However, knowing what we do about Earth's life the door on Gliese's Earth is definitely ajar. We need to know more about Gliese's Earth, because if a few things fall into place bacterial life could be quite possible. Indeed, we might even conclude that some of earth's bacteria could adapt to its conditions and thrive.

One overlooked aspect of life here is Earth's axial tilt of about 24° which creates changing temperatures and nurtures changing the polar caps. While that's all aesthetically pleasing to us, it's quite accommodating for life because it creates significant temperature differences, water circulation and temperature gradients. If Gliese's Earth has no Moon, the possibility of severe and periodic axial tilting causing one hemisphere to face Gliese like Uranus does permanently and like Mars has done periodically is very likely. Again this would create temperature differences that would encourage circulation and gradients. Either way, we can't rule out mountains, volcanoes and active plate tectonics under the vast ocean. There's a large scientific body that says that's just the stuff that got earth's life started. The only mitigating factor is that it's all covered by an ocean. That's a problem.

Every serious discussion on the formation of life gets to a place where the formation of biological membranes is essential. More, membrane development calls for periods of drying in the process which couldn't happen on Gliese Earth unless there's a mechanism for ice formation; hence we need to know if it's got a moon that prevents axial tilts like our moon does here That could resolve the question.

Some bacteria here on earth can thrive at 121°centigrade which requires high pressure to generate. So, if life got started there why couldn't it adapt to the much higher temperatures also stabilized there by high pressure. Don't rule out the extremes bacterial life has adapted to here on Earth. Bacteria thrive where there's lethal radiation, lethal levels of toxic metals and extremes of acid to name just a few extremes. If it happened here, why not there?

Please cut some slack when I say, "Don't rule out the possibility of life on GJ1214b", I'll bet that Carl Sagan would agree with me. Indeed, I have a feeling he'd even raise even more reasons to keep the idea alive. Don't rule GJ1214-b out.

2010 Yosemite Star Party

LeRoy Wiens



The MDAS date for the annual Yosemite Star Party extravaganza is August 6-7th.

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 11 pm., 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 that 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.

Contact me at 925-689-9924 or email LDWiens@pacbell.net if you need more information.

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/>

Other Astro Events

GSSP links

<http://www.goldenstatestarparty.org/>
general info
<http://www.goldenstatestarparty.org/home/2009-registration>
registration
<http://www.goldenstatestarparty.org/home/rules-guidelines>
rules & guidelines
<http://www.goldenstatestarparty.org/events-schedule>
event schedule

Saturday, July 10 - Wednesday, July 14th



Golden State Star Party 2010

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

President:

Liede-Marie Haitsma, stfrncis@ix.netcom.com

Vice President:

Chris Ford, cford81@comcast.net

Treasurer:

Wil Roberge, wil@donahue.com

Secretary:

Malinda "Moon" Trask, metallicamoon@sbcglobal.com

Board members:

Publicity/Member-At-Large: Steve Jacobs
llsjacobs@astound.net

Meeting Program Chair: Marni Berendsen
berendsen@aol.com

What's Up? Program Chair: James Scala
jscala2@comcast.net

Outreach Program Chair/Member-At-Large/AANC Rep:
Jim Head - outreachinfo@mdas.net

Observation Activities Chair/Member-At-Large: Richard Ozer
info@mdas.net

WAA Representative: Jon Wilson
jwilson8721@sbcglobal.net

Web Design: Glenn Spiegelman
webinfo@mdas.net

Newsletter Editor: Rob Haitsma
sjshark2@ix.netcom.com

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

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

MDAS Meetings and Viewing Events in July 2010

| Sunday | Monday | Tuesday | Wednesday |
|--|---|---|-----------------|
| 27 | 28 | 29 | 30 |
| Independence Day 4  | 5 | 6 | 7 |
| 9:00 AM GSSP 11  | 9:00 AM GSSP 12 7:30 PM Board Meeting | 9:00 AM GSSP 13 7:00 PM MDAS Imaging SIG | 9:00 AM GSSP 14 |
| 18  | 19 | 20 | 21 |
| 25 | 26  | 7:15 PM GenMtg: 1st 2 billion yrs 27 | 28 |

| Thursday | Friday | Saturday |
|----------|---------------------------------|--|
| 1 | 8:00 PM Lick Obs Summer Prog | 2 8:00 PM Lick Obs Summer Music Sunset: 8:36 PM |
| 8 | 9 | 10 Society Observing 9:00 AM GSSP Sunset: 8:34 PM |
| 15 | Lick Obs Summer Prog | 16 7:30 PM Lick Obs Summer Music 8:00 PM EXPLORE OUR GALAXY Sunset: 8:30 PM |
| 22 | 23 | 24 Sunset: 8:26 PM |
| 29 | 7:30 PM Lick Obs Summer Prog | 30 7:30 PM Lick Obs Summer Music Sunset: 8:20 PM |

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