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Mount Diablo Astronomical Society

Diablo Moon Watch

February 2012

GENERAL MEETING

Tuesday February 28, 2012

“Quantum Mechanics, Gravity, and the Multiverse”

Dr. Yasunori Nomura

*Doors open at 6:45 p.m.
Concord Police Association Facility
5060 Avila Road, Concord*



The discovery of the accelerating universe has led to the dramatic new view that our universe may be one of the many universes in which low energy physical laws take different forms: the multiverse.

Dr. Yasunori Nomura will explain Tuesday February 28 why and how this view is supported both observationally and theoretically, especially by string theory and eternal inflation.

He will then describe how quantum mechanics plays a cru-

cial role in understanding the multiverse, even at the largest distance scales. The resulting picture leads to a revolutionary change of our view on spacetime and gravity, and provides complete unification of the eternally inflating multiverse and many worlds in quantum mechanics.

Yasunori Nomura received his Ph.D. from University of Tokyo in 2000, where he held a fellowship of Japan Society for the Promotion of Science. He was a Miller Research Fellow at

University of California, Berkeley from 2000 to 2002, and an Associate Scientist at Fermi National Accelerator Laboratory from 2002 to 2003. He joined the Berkeley physics faculty in July 2003. He was awarded DOE Outstanding Junior Investigator Award (2004), Alfred P. Sloan Research Fellowship (2005), Hellman Family Faculty Fund Award (2005), and Simons Fellow in Theoretical Physics (2011). He is currently the Group Leader of the Berkeley Particle Theory Group.



WHAT'S UP *Astronomy in K-12 Schools and Scouting Programs.*

A brief look at how our outreach program can augment the California Department of Education Science Standards for Primary and Secondary education.

Jim Head

PRESIDENT'S CORNER

Adventures in Aperture Fever (Part 2)

by Chris Ford

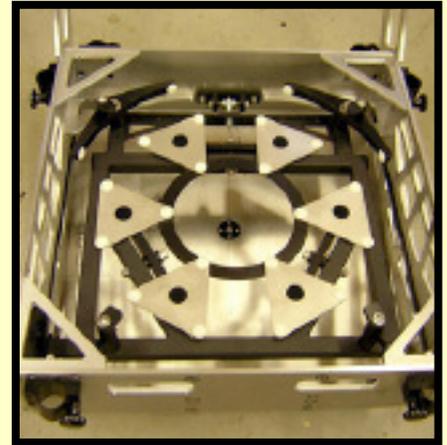
Last May I described the decision process that led me to place an order for a 24" fast F/3.3 newtonian reflector from Tom Osypowski of Equatorial Platforms.

Since then, almost eight months has passed and now is a good time to review how the telescope is proceeding as part of my promised case study on the experience of having a large telescope custom built should any other society member be thinking along similar lines.

To recap, my initial requirements were for a 24" newtonian consisting of an aluminum structure with full tracking and GOTO capabilities, compact enough to fit in a medium sized SUV, have no need for large ladders, adaptable to video-astronomy and photographic purposes, and from a practical point of view able to fit through the various doors and openings in my house. All of these requirements coincided in a timely manner with the ongoing trend to very fast mirrors in large aperture dobsonians and why I finally settled for the fast focal ratio of F/3.3. Interestingly since I ordered my telescope, and as some of you may have read on Cloudy Nights, we are now seeing the appearance of even faster F/2.8 dobsonians, though all telescopes this fast need coma correcting optics such as the Televue Parracor 2.

The heart of the telescope is of course the primary and secondary mirror assembly and I ordered these optical components last May from Mike Lockwood who currently enjoys a reputation as one of the - if not the, premier makers of large diameter fast mirrors for amateur telescopes. After some discussion between Tom, Mike, and I, we selected a supremax 1.6" thin mirror for its faster cool down properties. Thinner mirrors however have more demanding support requirements, and an interesting aspect of the telescope is the 18-point mirror cell support, whose characteristics were calculated using the PLOP CAD software analysis tool to optimize the cell design for a mirror of this diameter and thickness. Developed by Aurora Precision in Oregon, the mirror cell has no edge support slings or traditional three collimation adjustments found in many dobsonians. Instead the mirror rides on a solid aluminum cradle with four rocker edge supports that is collimated using just two brass adjustment knobs on the rear.

A scheduling challenge has been synchronizing the delivery dates of the mirror from Mike Lockwood with the structure from Tom Osypowski, but the timelines appear to be coming together nicely. Mike is a busy full time professional mirror-maker, but informed me in December that my mirror will be entering production in January 2012. Mike will also be producing the secondary mirror and will test both together.



A 18-point mirror cell from Aurora Precision.

As of January 2012, the aluminum structure of the telescope is almost complete. Given that most commercial dobsonians are made of wood, not everyone may be aware of some of the processes that go into making an aluminum telescope and Tom Osypowski kindly sent me a photo summary of some of the constructional aspects as follows:



(1) This is a picture of the azimuth ring attached to the azimuth ground plate disc on which the entire telescope will be mounted. The ring started out as 3/4" square bar that is rolled and

Adventures in Aperture Fever (Part 2) *(Continued from the previous page)*

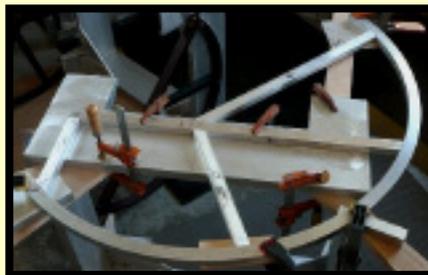
welded into a ring and then attached to the disc with 15 screws.



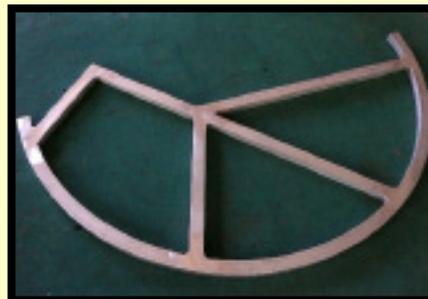
(2) The ring and disc were then jugged up on a table and the curve on the ring trued up with a router bit as can be seen in the slot in the bottom right. The feet pads have also been attached.



(3) Next, the altitude half-rings were fabricated. Again, they started out as straight bar (3/4"x1") that was rolled into a half ring and then jugged up onto the mirror box. Straight bar is then cut to strengthen the ring to allow it to be mounted onto the rocker box:



(4) The straight bar pieces are jugged up and clamped to a piece of plywood, and then welded to the half ring, forming a solid one-piece unit:



(5) The result is one altitude half ring. There is more:



(6) Next, both alt half-rings are trued up with a router bit on the same jig as the azimuth full ring so they are all perfectly matched.



(7) The finished result is two alt half-rings that are precision cut to the same curve, ready to be mounted onto the rocker box.



(8) Meanwhile the mirror box, rocker box and upper cage assembly have also been constructed from Aluminum sheet and tubing.



(9) The completed upper cage assembly

Adventures in Aperture Fever (Part 2) *(Continued from the previous page)*



(10) And here it is, the 24" aluminum telescope assembled together at last in bare metal. Next it will be disassembled again and anodized in a dark grey. At maximum (zenith) height the eyepiece will be just over 80" high up from the ground. A foot stool will be necessary in that situation, but for a wide range of elevations, feet will be firmly planted on the ground.

Other ongoing work includes selecting the Starlight Instruments, Feather Touch focuser, installing the wiring for the secondary dew heater and other accessories, the integration of the slipstream drive system from Sidereal technologies that integrates a slip clutch on both axis for manual and motorized control without hav-

ing to lock/unlock clutches. In

fact the telescope rests purely by weight alone on the rollers you can see in the picture on the left and can casually be moved to any position. There is no teflon or formica, and in fact this telescope has very little in common with a classic dobsonian, though that name has stuck to describe almost any alt/azimuth mounted amateur newtonian.

Most recently, I chose a 80mm Stellarvue (Raptor) refractor as the finder, and also selected the shroud and carrying bags for the truss poles and upper cage. Now everything is set for the completion of the mirror and its final integration with the structure followed by star testing the all up telescope. It's going to be a long few months but there is still time to pull everything together before the GSSP!

If anyone is looking at a large aperture dobsonian and has any questions on the research that went into this whole experience, please do contact me.

Chris Ford

Time to Order Your MDAS Jacket!

Show your colors! Place your order for the royal blue, embroidered and personalized MDAS jacket. We are planning to place the order by the end of April, so reserve yours now:

http://www.mdas.net/mdas_store.html#MDAS_Jacket



You may also reserve your personalized jacket by sending an email to memberinfo@mdas.net or call Marni Berendsen at 925-930-7431.

BE SURE TO TELL US THE SIZE YOU WANT (M, L, XL, XXL) AND THE FIRST NAME YOU WANT EMBROIDERED ON THE JACKET.

You can bring a check for \$55 made payable M.D.A.S. to the next meeting or send the check to this address:

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

The Merits of Having a Space Colony

by Nathaniel Bates

I almost fell off my chair when I heard him say it:

Newt Gingrich, of all people, desires a colony on the Moon! I did not expect to hear about a Moon colony on NPR, indeed I compartmentalize my mind such that Astronomy is a night time endeavor to be enjoyed after dark when clear boundaries blur and the sense of liminality takes over. Yet, there is was, a discussion of a manned space program that begins to colonize other rocks in the Solar System. With enough time, and enough movement in this direction, the Earth itself will be seen as the “other rock” by denizens of the Moon and neighboring worlds.

It is time to discuss whether this is a good idea for our species.

It is not only Gingrich who advocates some kind of space program. President Obama also advocates a venture to Mars. In the case of Gingrich’s plan, I personally wonder to what extent his program will be civilian or military in nature. (A military space program would raise ethical questions to say the least, ones that will not be explored at this time.) In the case of the President’s program, I wonder to what extent his plan his feasible in the way it is laid out. Both programs raise questions around sovereignty and international controversies over which nations will be included in the colonization of other Solar bodies. However, there are deeper questions concerning us that arise when we consider the possibility that both the Moon and the red

planet that filed our ancestors with a sense of mystery might become the familiar territories of human planners. Those questions will certainly redefine, or at the very least revise, our human identity. It is this deeper question that I wish to address.

Humans arose in a natural environment.



Most of our deepest notions of individuality are products of our natural heritage. From Rousseau’s “natural man” to the pastoral images of various cultures and religions, humanity is seen as most himself when surrounded by plants and animals. Most philosophers have viewed any human cut off from the natural world as also being alienated from himself. This is where Darwin and the various Creationists of different religions would agree; that humans did not arise in cities. Indeed, if we are to settle humans in an environment like the moon that is not natural to us, we are taking a gamble as to what possi-

ble psychological effects might manifest. As for terraforming Mars, the execution of the plan might take a long time before Mars becomes “natural.” Meanwhile, humans would have to adapt to a fundamentally alien environment in which it would be difficult to connect to any sense of feeling imbedded in the ecology of one’s home world. Even such funda-

mental questions as the degree to which humans would be able to exercise sovereignty and self-government under entirely artificial conditions have never been tested. One would expect a need for psychologists among the burgeoning space colonies in order to address

these issues.

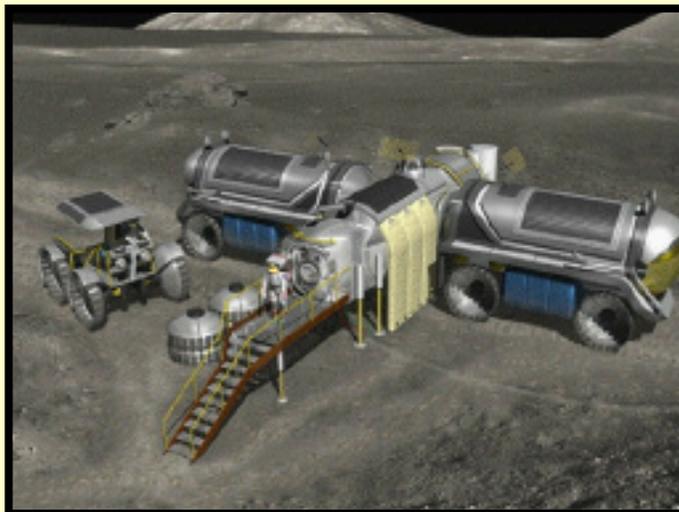
Add to the list of possible objections the fact that many, perhaps most, space scientists prefer unmanned exploration to manned exploration. It is not hard to understand why Astrobiologists and space scientists are not all that “enthused” about spending precious resources out of the NASA budget on manned exploration that could have gone to pure science research. This is by no means a universal sentiment, even among NASA scientists. There are certainly scientists who are supporters of the Planetary Society. Often, however, these scientists assume that science would

The Merits of Having a Space Colony *(Continued from the previous page)*

be the main goal of space colonies. Lets remember that science was not the main goal of settling the new world of the Americas—profit was. A lot of resources will go to the colony, and it would be naïve to assume that the founders of the colony would not want a return on investment.

So many objections. . .

One wonders why we would want such a thing as a space colony. After all, we have been a wandering and exploring species, preferring to see new horizons for itself, as opposed to viewing them as images sent from a robotic probe! Most of us thrilled to Star Trek and felt our spirits lifted when the Astronauts brought humanity to space. We have to admit that the idea of continuing to be an earth-bound species has a reactionary sense of dread to it. We might also admit that we are imbedded in Nature but there is some sense among us that the future demands of us that our descendents move upward. Even those who believe that humanity's greatest error was in alienating ourselves from our natural environment must admit or concede that the accomplishment of a Mars colony would be a thrilling one indeed.



Also of note should be the iron law of statistical probability. If we stick around on Earth long enough, we WILL face an asteroid coming our way. It is not a matter of “if” we face an object hurdling towards us, but “when.” A species that simply lives on one planet has less of a chance of survival than a species that has moved on to terraform a neighboring planet. Again, it is a simple matter of statistics. Straddling Earth and Mars

would give us a better chance of survival. A space colony would seem to be desirable under such circumstances. Personally, I feel that the President's plan would address this issue far better than Newt Gingrich's lunar plan. Then again, Mars is further away than the Moon and it is possible that a baby species needs baby steps before attempting large leaps.

Most of us are between the two extremes of Primitivism and Techno-Futurism. Primitivists like the philosopher John Zerzan would have us return to the hunter gatherer period. It would

be their honest wish for us to leave even agriculture behind, believing that this would be the only way we could save the planet and fulfill our sense of personhood. By contrast, Techno-Futurism has such a regard for technology and space travel that it embraces Transhumanism, the notion that our destiny is to merge with machines. Presumably, only by merging with machines would we be able to withstand the rigors of space. I often wonder if the clash between these two extremes will define many of the struggles of the future. The first group will lament disappearing species and a sense of the loss of Nature. The second group will lament it if we do not make it in to space and advance further than we have. Oddly, the one thing both groups might agree upon is a sense that their personal autonomy has been restricted in the world as it is, if little else.

One final issue, often, population is said to be a good reason to push out in to space. Space travel is not a realistic solution to human population dilemmas. Populations grow exponentially, while the surface area of Mars itself is less than that of Earth. It would take a long time to colonize the entire surface of Mars, and it may not necessarily solve our population issue or ecological problems (although some conceivable solutions might exist out there).

The Merits of Having a Space Colony *(Continued from the previous page)*



If we push out, it is not our numbers that push us. Rather, we venture out because we must.

There might well be something in us that demands that we continually explore. We pushed out of Africa. We pushed to all Continents. It may well be that there is something deeper than profit, deeper than scientific curiosity, and deeper than solving problems that would compel us out there. If we as a species decide to move out in to space, and if we survive long enough we will do it. Most of us in this Club

who point our Scopes to the firmament know instinctively why we do it. There is something about the night that compels us. It is not entirely by choice. We do not move toward the Orion nebula in the lit blackness of winter night. It moves us toward itself and we had better admit it.

Lets agree that most of us rest between the two extremes of Primitivism and Techno-Futurism described previously. The majority of humans view space as the Final Frontier, but would hope to bring their humanity with them. Most hope to explore the Solar System, but would hope to do it with human stereoscopic vision and without the eyes of a machine. You do remember when I stated that we are a species that prefers to see for ourselves,

unmediated by a screen? The ability to actually see a planet with human eyes was the great hope of Star Trek. Nothing can replace the personal experience with all its senses.

It is probably unlikely that we would actually be able to walk around an alien planet and have it be earthlike, a green and lush place. Our Star Trek fantasy allowed for this, but reality probably would not allow this for some time. If we do push out in to space, we have to be realistic about what our venture will be. It will not be Star Trek. Nor do I think we will merge with machines.

We will experience human life in all of its complexities on Mars or anywhere else. We will have brought the angst of our species, along with our full emotions, out in to the blackness of space.

It's Membership Renewal Time!

Renew your MDAS membership and your magazines online!

ANNUAL MEMBERSHIP DUES OF \$25 ARE DUE BY APRIL 1, 2012 for members on the April membership cycle. That's almost everyone. Some of our members renew in October, but they will be notified separately.

To renew your club membership, you may either:

- Renew online using Paypal or your credit card at: http://mdas.net/mdas_store.html, select Membership Renewal. On the same web page, please consider making an additional MDAS Donation of \$10 or \$15 to further support our club. Even \$5 helps.

- Or if you do not have internet access or prefer not to make online payments, you may mail a check for \$25 (or more!) made payable to the M.D.A.S. to this address:

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MAGAZINE SUBSCRIPTION RENEWALS

All Sky & Telescope and Astronomy magazine subscriptions renewals are handled online AT THE CLUB DISCOUNT RATE!

The Astronomical Society of the Pacific has made arrangements with these magazines to allow members of the NASA Night Sky Network to renew at the club discount rate. All you need is a login for the Night Sky Network (NSN) through our club.

You can log into Night Sky

Network and go to the Magazine Subscriptions and Links page to find the "New and Renewal Subscriptions" link. Here's the direct link:

<http://www.astrosociety.org/magazine/>

If you don't have access to a computer, please renew by mail directly with the magazine using your renewal notification.

Any questions, please email memberinfo@mdas.net or call Marni Berendsen at 925-930-7431.



Mount Diablo Astronomical Society Event Calendar—February 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29	30	31	Westwood Science Fair (Private) 1	Indian Valley Stargazing (Private) 2	3	4 Sunset: 5:35 PM
5	6	7 	8	9	10	11 Observatory Maintenance (Private) Sunset: 5:43 PM
12	Board Meeting (Private) 13	MDAS Imaging SIG (Private) 14 	15	16	17	18 Society Observing (Private) Sunset: 5:50 PM
19	Washington's Birthday 20	21 	22	23 Hidden Valley Science Fair (Private)	24	25 Society Observing (Private) Sunset: 5:58 PM
26	27	7:15 PM GenMtg: Quantum Multiverse 28	29	1	2	3

FOR SALE: MEADE LX200 (8") ASTROPHOTOGRAPHY SETUP.

I have just purchased a new imaging telescope and mount, and will be selling my current Telescope, mount, and some accessories. Includes:

- Meade LX 200 – 8" F10 Telescope and mount;
- Meade 1207 Electric Focuser;
- Meade balancing weight set;
- JMI hard carrying case for the LX200;
- Heavy-duty Milburn Wedge;
- LX90 OTA and Guide Star Mount; Meade
- Dew shield for the LX200; LX90 Dew Shield.
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MDAS

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Walnut Creek, CA 94596-

General Meetings:

Fourth Tuesday every month,

except on the third Tuesday

Refreshments and conversations

Meetings begin at 7:15pm.

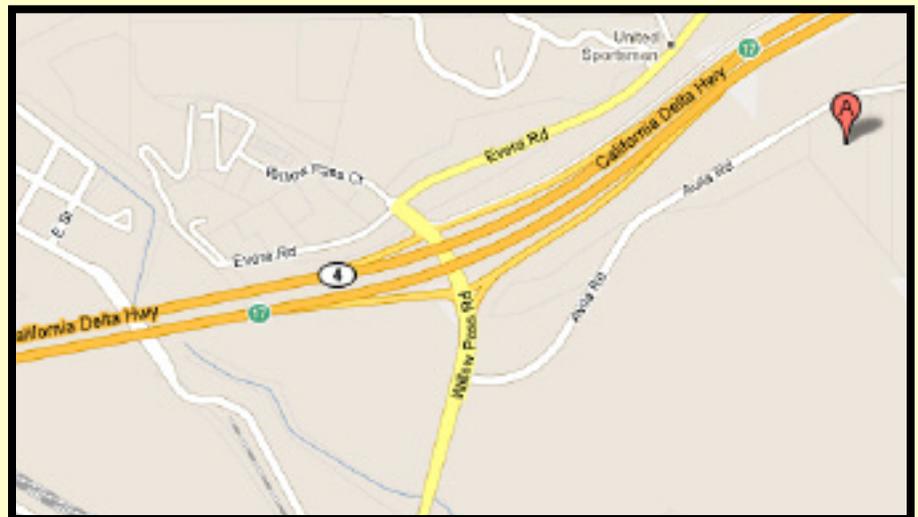
Where:

Concord Police Association

5060 Avila Road, top of the

Take Avila Road from Willow

Directions to facility:



Your Help Would Be Greatly Appreciated

Our association needs a few members to come at 6:30 p.m. before our monthly meeting which starts at 7:15 p.m. to help in setting up the chairs and other elements needed to conduct the general meeting.

Similarly at the end of each meeting the chairs and tables have to be removed, the room has to be cleaned and the garbage emptied.

Thank you for your help.

