



# The Mason-Dixon Astronomer

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## Star Points for November 2011

“Aquanauts Path Finding for Asteroid Journey”

by Curtis Roelle

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A group of international astronauts and aquanauts have been performing underwater simulations in preparation for a possible future manned journey to an asteroid. Because all asteroids possess a small size, low mass, and weak gravitational field compared to Earth, an undersea training facility is being used where participants take advantage of water's buoyant quality in simulating working on the surface of an asteroid body.

The training facility is located 60 feet below the water's surface about 3.5 miles offshore of Key Largo, Florida. The Aquarius Underwater Laboratory (UAL) has so far been used for 15 “aquanaut” expeditions in the NASA Extreme Environmental Mission Operations (NEEMA) program. NEEMA is a joint venture between NASA, the National Oceanic and Atmospheric Administration (NOAA), and the University of North Carolina, Wilmington.

In October, a 13-day NEEMA expedition had to be cut short due to Hurricane Rita. Among its six-member crew was veteran astronaut Shannon Walker. In 2010 Walker spent 163 days in space on Expedition 21/22 of the International Space Station (ISS).

NASA and its contractors are developing a human-capable spacecraft for a variety of missions to possible destinations including the Moon, asteroids, and eventually, Mars. The heart of the Multi-Purpose Crew Vehicle (MPCV) is the Orion capsule. At the U.S. Rocket Center at Huntsville, Alabama, this summer I saw a full-sized Orion mockup. It resembles the conical Apollo command module (CM) that carried men to and from the Moon in the late 1960s and early 1970s. However, the CM carried three persons whereas the significantly larger Orion seats up to six.

In one hypothetical asteroid mission nicknamed Operation Plymouth Rock, two MPCV spacecraft join nose-to-nose and journey off to a near-Earth asteroid. As the spacecraft performs “station keeping” a short distance from the asteroid, an astronaut will spacewalk to the asteroid using a Manned Maneuvering Unit (MMU) backpack similar to those previously used on several space shuttle missions.

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**November Meeting:** Wednesday, November 9, 2011, 7:30 p.m., Bear Branch Nature Center

**Speaker:** Gary Hand of Hands On Optics will lead a Telescope Buyers Workshop. Please see a description on page 5.

**Next WASI Observing Weekend:** Friday and Saturday, November 18 and 19

## President's Message for November

by Jim Reynolds

All,

It's hard to believe that November is here already. It seems like it was just a few weeks ago that September was just ending.

Last month my October message was not published because I got the deadlines mixed up, so I want to profusely apologize to the MDA editor (Vanessa) for my mistake and to thank her for her patience in explaining to me why I was so mixed up over the deadlines. Vanessa has done a really outstanding and professional job this year, and I hope that everyone realizes how much personal time she has put into putting out the MDA so faithfully.

November is, has, and always will be one of my favorite months for stargazing. Some of the summer constellations can be seen around dusk with the added benefit of winter constellations coming into view at more convenient times.

November has a lot to offer everyone outstanding observational opportunities.

November 10<sup>th</sup> – Full Moon (“The Full Beaver”): This was the time to set beaver traps before the swamps froze, to ensure a supply of warm winter furs. Another interpretation suggests that the name Full Beaver Moon comes from the fact that the beavers are now actively preparing for winter. It is sometimes also referred to as the Frosty Moon. (Source: FarmersAlmanac.com)

The following list of meteors showers is from earthsky.org:

### **November 5, 2011** South Taurids

The South (and North) Taurids are perhaps best suited to die-hard meteor aficionados. The meteoroid stream that feeds the Taurids is very spread out and dissipated. That means the Taurids are extremely long lasting (September 25 to November 25) but usually don't offer a lot more than about 7 meteors per hour, even on the South Taurids' expected peak date of November 5/6. The big and bright waxing gibbous Moon ruins the show during the evening hours on November 5, but if you're a night owl, try watching after moonset, or in the wee hours after midnight on November 6.

### **November 11 and 12, 2011** North Taurids

This shower is long lasting (October 12 – December 2) but modest, and the peak number is forecast at about 7 meteors per hour. Typically, you see the maximum numbers at around midnight to 1 a.m., when Taurus the Bull moves nearly overhead. This year, the bright waning gibbous Moon shines right in front of the constellation Taurus, making 2011 an unfavorable year for watching these rather slow-moving but sometimes bright North Taurid meteors. The greatest numbers of North Taurid meteors come at late night and after midnight on the nights of *November 11 and 12*, but you might want to write off this year's North Taurids because of the strong moonlit glare.

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## Star Points *continued*

In a more advanced plan, NASA sends a new spacecraft along with the MPCV. The Space Exploration Vehicle (SEV) would support various configurations depending on the target body. One configuration equipped with stubby legs and a remote manipulator arm would gingerly land directly onto an asteroid, permitting tethered astronauts to disembark. Tethering is required to prevent the astronauts from drifting away in the asteroid's weak gravity.

The idea of astronauts working in water or "neutral buoyancy" environments have been around since Buzz Aldrin led the way and made Maryland history. He used a 75-foot pool at the McDonough School in Owings Mills while training for his own 1966 space walk on the Gemini 12 space mission. The NEEMO project is helping NASA flesh out the procedures and techniques allowing humans to operate safely on and around an asteroid. These include methods for anchoring to the asteroid surface, establishing and maintaining a connection to the anchoring system, and collecting scientific data and surface samples.

Because of the delay in communication between Earth and a manned crew on a distant asteroid due to the finite speed of light, a 50-second delay was inserted into transmissions between Aquarius and NEEMO's mission control center. The farthest humans have traveled from Earth is to the Moon. On lunar missions the communications delay due to light speed was just over one second.

So how soon before a person sets boot or glove on an asteroid? In its current plan, NASA is targeting the year 2025. The candidate asteroids will be relatively puny, up to a little larger than a football field across. Which asteroid will be targeted depends on many variables, with schedule being a key factor.

The mission is by no means a done deal. NASA's shifting focus is in reaction to direction at the top. In 2004 then-president George W. Bush directed NASA to return humans to the Moon by 2020 and eventually speed on to Mars at some future date.

In 2010 president Obama replaced Bush's plan with his own. In it he also replaced the lunar effort with a manned asteroid mission in 2025, followed by humans going to Mars in the mid 2030s. An earlier manned Mars effort was proposed by George H.W. Bush in 1989, but was canceled by Congress.

There will be at least two and as many as four new administrations in power before the 2025 target date is reached. Between now and then the goals may change and shift several more times.

*"Star Points" by Curtis Roelle appears in the Carroll County Times on the first Sunday of each month. Visit the website at <http://www.starpoints.org> or send email to [StarPoints@gmail.com](mailto:StarPoints@gmail.com).*

## President's Message *continued*

### **November 17, 2011** Leonids

Historically, the Leonids have produced some of the greatest meteor storms in history, with rates as high as many thousands of meteors per hour. These storms sometimes recur in cycles of 33 to 34 years. Most years, the Lion whimpers rather than roars, producing a maximum of perhaps 10-15 meteors per hour. Like the October Orionids, the Leonids ordinarily pick up steam after midnight and display the greatest meteor numbers just before dawn. This year, however, the last-quarter Moon will be shining near the radiant point of the shower in the constellation Leo. The unwelcome presence of the Moon is sure to dampen this year's Leonid display. If you're game, you can try watching from late night November 17 till dawn November 18, though the moonlit glare will subdue the 2011 Leonid meteor shower.

November is also a month for giving thanks. One way to give thanks is to donate some of your spare time (assuming you have any) to astronomy public outreach. It's not only very personally satisfying, but it's also a great way to keep Westminster Astronomical Society ranked as one of the Night Sky Network's highest rated astronomy clubs/societies (but we all already know that we're the best)!

If you're interested in doing public outreach, "Project ASTRO" is still looking for volunteers for the next academic year 2012 – 2013. So be sure to let me know if you're interested in this fantastic chance to share your love of astronomy with others.

There are many other opportunities throughout the year via WASI, so be sure to volunteer your time if you can spare it.

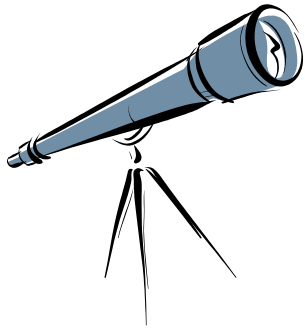
I hope to see a lot of folks at the November monthly meeting on November 9th.

It's been an real honor to serve as the president of WASI this year, but I am very pressed for spare time and I will not be putting my name in the hat for re-election. I wish the next WASI president all the best. I will continue to share the planetarium show schedule with Curt while Brian Eney, our planetarium director, is working on his post-graduate degree. I'm hoping to have some spare time to assist in other WASI public outreach events as well.

Take care all!

Regards,  
Jim Reynolds

## Upcoming Events



**Monthly WASI Meeting** November 9, 7:30 p.m., at Bear Branch Nature Center (BBNC)

**Soldiers Delight Public Stargazing** November 12, 8 p.m., at Soldiers Delight Natural Environment Area in Owings Mills

**WASI Member Observing Weekend** November 18 & 19 at BBNC

**Planetarium Show** December 3, 7:30 p.m., at BBNC

## NOVEMBER PROGRAM

**Speaker:** Gary Hand

**Topic:** Telescope Buyers Workshop

Gary Hand of Hands On Optics provide tips on purchasing a telescope — what to buy and what to avoid. Aimed at first-time buyers, Gary also has many years of experience helping thousands of astronomers purchasing that “next telescope” as well.

We will be meeting Gary for dinner before the meeting at 6 p.m. at Harry’s Main Street Grille in Westminster.

## Minutes of Meeting on October 12, 2011

Called to order at 7:40 by Jim Reynolds (Club Pres.)

Various Announcements (Skip)

Outreach Event at Maryland Science Center 7:00 PM on Oct 20.

Outreach Event at Great Park in Fairfax (contact Skip for Trans.)

Outreach Event at Air-Space Museum (October 29, 2 to 10 PM according to the Smithsonian web page) Note: If you intend to help-out on it let Skip know early so you get on the list.

Otherwise you will have to pay \$15 parking.

Jim Reynolds announced:

The next meeting will be the annual “how to buy a telescope” meeting with Gary Hand (Hands on Optics).

The December meeting will be the potluck meeting.

Curt: Observatory Report:

- 1) The county has asked for changes (roof, etc.) to get plans in line with the existing buildings.
- 2) We are waiting for the contractor to respond.
- 3) The Parks Dept now wants to be part of the permit process.

Jim Reynolds:

Officers meeting to be held on October 28. Time and place TBA.

Speaker Dr. Rommel J. Miranda of Towson University

Topic: Deep Impact (Impact on students)

Subjects – Points Made:

We have a duty to do outreach

Project Astro was a grant program that was able to continue after its grant ran out.

He has been studying characteristics of science teachers and those of successful students of science (astronomy).

Many teachers feel that the students lack cognitive skills.

Curriculum gets watered down.

They teach to the test.

While knowledge may not be enhanced there are obvious attitudinal improvements.

Many teachers seem to hold an elitist view of science so they tend to lower the bar for disadvantaged students.

Completed at 8:40 PM

Meeting adjourned at 9:00 PM

Respectfully submitted,

Robert L. Clark

## A Report from Skip

Howdy Fellow Astronomers,

Its getting to that time of year when the Ghost and Goblins have gone away, the turkeys start getting nervous, and the kids start acting good hoping Santa has a short memory. By the time you read this we will have done another Air & Scare (loaded up on candy and had 5000+ visitors stop by our telescopes). We will be gearing up for the November meeting, the Telescopes Buyers Work shop or 101 reasons not to get your “Quality” telescope from a chain store. Our “Politically Correct Holiday Meeting” known as talking with your friends while eating good food. Outreach usually slows down during these months except for the BBNC and Soldiers Delight programs. We made the news again ([http://nightsky.jpl.nasa.gov/news-display.cfm?News\\_ID=460](http://nightsky.jpl.nasa.gov/news-display.cfm?News_ID=460)).

For future planning, the Transit of Venus is returning to a local sky near you in 2012. (Don't miss the opening because it won't make it to reruns until 108 years later.) More on this later. Hope everyone saw the auroras on October 24<sup>th</sup>. (It was cloudy where I was in Virginia.) They may be back. If you see any in the future call everyone you know in the club, and they can call everyone they know, and they can call everyone they know, and on and on and on (that should reach 7-8 people).

The James Webb Space Telescope display at the Maryland Science Center was a great success (if the telescope continues to get funds). I had a great time and I'm sure Vanessa did, too. (Vanessa says yes, it was a beautiful night and a lot of fun stargazing next to the full-size JWST model!) Friday nights at the science center are really fun, when the weather cooperates. It's amazing how many people have never looked through a telescope before. It also amazes me that most of the people at the Inner Harbor are visitors, but are still willing to donate a dollar for our observatory. Speaking of observatories, things are still going forward at this time. We may need one more financial push to cover all the expenses (remember your donations are tax deductible).



WASI telescopes and the James Webb Space Telescope model at the Maryland Science Center in October 2011. *photo by Vanessa Thomas*

I had the chance to spend several days out in the mountains of Virginia and West Virginia and was amazed at the views of the Milky Way, Jupiter, and lots of assorted nebulas, galaxies, and clusters. It got me excited about astronomizing again. It also has reinforced the need for light-pollution awareness. We miss so much of the majesty of the night sky because we can't see it due to the mistaken notion that more is better. (I'll save this for another article.)

Thanks for reading.  
Skip



## The Gray Cubicle You Want to Work In

By Dr. Tony Phillips

It's another day at the office.

You're sitting in a gray cubicle, tap-tap-taping away on your keyboard, when suddenly your neighbor lets out a whoop of delight.

Over the top of the carpeted divider you see a star exploding on the computer screen. An unauthorized video game? No, this explosion is real. A massive star just went supernova in the Whirlpool Galaxy, and the first images from Hubble are popping up on your office-mate's screen.

It's another day at the office ... *at NASA*.

Just down the hall, another office-mate is analyzing global temperature trends. On the floor below, a team of engineers gathers to decode signals from a spaceship that entered "safe mode" when it was hit by a solar flare. And three floors above, a financial analyst snaps her pencil-tip as she tries to figure out how to afford *just one more* sensor for a new robotic spacecraft.

These are just a few of the things going on every day at NASA headquarters in Washington, DC, and more than a dozen other NASA centers scattered around the country. The variety of NASA research and, moreover, the variety of NASA people required to carry it out often comes as a surprise. Consider the following:

NASA's Science Mission Directorate (SMD) supports research in four main areas: Earth Science, Heliophysics, Astrophysics, and Planetary Science. Read that list one more time. It includes everything in the cosmos from the ground beneath our feet to the Sun in the sky to the most distant galaxies at the edge of the universe. Walking among the cubicles in NASA's science offices, you are likely to meet people working on climate change, extraterrestrial life, Earth-threatening asteroids, black holes, or a hundred other things guaranteed to give a curious-minded person goose bumps. Truly, no other government agency has a bigger job description.

*(Continued on next page)*



And it's not just scientists doing the work. NASA needs engineers to design its observatories and build its spacecraft, mathematicians to analyze orbits and decipher signals, and financial wizards to manage the accounts and figure out how to pay for everything NASA dreamers want to do. Even writers and artists have a place in the NASA scheme of things. Someone has to explain it all to the general public.

Clearly, some cubicles are more interesting than others. For more information about the Science Mission Directorate, visit [science.nasa.gov](http://science.nasa.gov). And for another way to reach the Space Place, go to <http://science.nasa.gov/kids>.

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*Some of the employees of NASA's Science Mission Directorate may work in gray cubicles, but their jobs are anything but dull. They get to study Earth, the Sun, the solar system, and the universe!*