November-December
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The Observer

The Newsletter of Central Valley Astronomers of Fresno

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CVA Calendar

November 2-CVA Star Party at Eastman Lake

November 9-CVA Public Star Party at River Park

November 16-Monthly meeting at CSUF 7pm

November 30-CVA Star Party at Eastman Lake

December 14-CVA Monthly Meeting at CSUF 7pm-officer elections

December 28-CVA Star Party at Eastman Lake

Another Space Pioneer Slips into the Stars: Scott Carpenter 1926-2013

Astronomical Object of the Month

M38, also known as NGC 1912, is one of the lesser known Messier objects. An open cluster, it is 3,400 light years from Earth in the constellation Auriga, and is about 25 light years in diameter. It is one of three M open clusters, almost in a row, running through Auriga; the others are M36 and M37. M38 along with its siblings, is always a fun object to view. Image-HST/NASA

Quote of the Month:

The fact that we have not yet found the slightest evidence for life — much less intelligence — beyond this Earth does not surprise or disappoint me in the least. Our technology must still be laughably primitive; we may well be like jungle savages listening for the throbbing of tom-toms, while the ether around them carries more words per second than they could utter in a lifetime.

-Arthur C. Clark

● November 3-New Moon ○ November 17-Full Moon ● December 2-New Moon ○ December 17-Full Moon

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President's Message

I will start with some quick club business before I dive into the subject that interests me the most right now, Comet ISON.

Thanks to Dr. Fred Ringwald for a very interesting talk at the October meeting about atmospheric phenomena and an update on Fresno State's astronomy program. Thanks, also, to everyone else who has made a presentation this year. Chad Quandt is giving the November talk (November 16) and Dr. Ringwald has promised to find a good (or bad) sci-fi movie for the December meeting (December 14), which will include elections for 2014 club officers. Our last River Park star party of the year is November 9 and we have Eastman star parties scheduled for November 2 and 30 and December 28. Will the weather hold? The $64,000 question this fall is "will Comet ISON thrill or disappoint?" Well, that depends. I hate to be so non-committal, but comets are a fickle bunch. Instead, I will stick with the safer prediction that the San Francisco Giants will win the 2010 and 2012 World Series in fine style.

Back to the comet. From about October 2012 to about June 2013, Comet C/2012 S1 (ISON) was tracking the early brightness predictions pretty closely, brightening from about magnitude 18 to about magnitude 16. This was still too faint for visual observing with typical amateur telescopes, but it gave us a reason to be optimistic. Then, from June to September, Comet ISON was too close to the Sun from our point of view to be measured reliably. Unfortunately, when September rolled around, Comet ISON was found to be tracking below the early brightness predictions. The good news is that the most recent reports indicate a brightness surge, somewhat reminiscent of Comet Holmes in October 2007. However, because of Comet ISON's distance, this surge did not put the comet into the realm of the unaided eye. As of this writing (October 28), Comet ISON is about magnitude 8 and brightening. This puts it well within the reach of binoculars and small telescopes. Comet ISON is currently located about five degrees east of Mars in the southern part of Leo. Coincidentally, Comet 2P/Encke (a resident of the inner solar system sporting a 3.3 -year orbit) is nearby, being located about five degrees east of Beta Leo (Denebola). Comet Encke is about the same magnitude as Comet ISON, so this is a twofer.

If you want to see Comet ISON, Comet Encke, and Mars right now, you have to get up really early or stay up really late. Mars rises first, around 2:30 a.m., followed by Comet ISON around 3:00 a.m. and Comet Encke around 4:00 a.m. This means that they won't be very high in the southeastern sky until sunrise approaches. As the calendar advances, these three objects and their host constellation will rise earlier each morning. Will you?

What this means for CVA is that we will not be hosting a comet party for ISON this year. The early morning hours and unpredictable fall weather make a public event impractical. Early next year—when Comet ISON becomes an evening object—isn't looking so good either for a public event, mainly due to unpredictable winter weather. However, if we get good weather in late December and into January, Comet ISON will be well-placed in northern skies for you to take a peek.

Comet ISON reaches perihelion on Thanksgiving (November 28) and could reach negative magnitudes that rival or surpass Venus (the early predictions were around magnitude –14). Because Comet ISON is a sungrazer, the window of opportunity for peak brightness will only be a few hours long. Fortunately, this window is during the daytime for California. On Thanksgiving, Comet ISON's elongation from the Sun will be about one degree, which will make observing it very challenging and potentially dangerous. According to SkyTools 3, Comet ISON will reach peak brightness about 11:00 a.m. on Thanksgiving. Elongation on the day before and the day after will be a slightly more generous five degrees, but the comet will not be nearly as bright, though it will likely still have a negative magnitude.

You can learn more at NASA's Comet ISON Observing Campaign website: http://www.isoncampaign.org/Present#

Clear skies-Fred

CVA Calendar November-December 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 Day of the Dead-Mexico	2 CVA star party at Eastman Lake
3 New Moon Daylight Savings Time ends Solar eclipse in Africa and Atlantic Ocean	4	5	6	7	8	9 CVA public starparty at Riverpark
10	11 Veterans' Day	12 Voyager 1 flies past Saturn-1980	13 Mariner 9 orbits Mars-1971	14	15	16 Luna 17-first wheeled rover on the Moon-1970 CVA monthly meeting CSUF-East Eng 191-7pm
17 Full Moon	18	19	20	21	22	23
24	25	26	27 Hannukkah begins at sunset	28 Thanksgiving Day	29	30 CVA star party at Eastman Lake
December 1	2 New Moon Galileo uses his new telescope to look at Moon for the first time-1609	3 Pioneer 10 flies past Jupiter-1973	4	5	6	7 Pearl Harbor Day
8	9	10	11	12	13	14 Mariner 2 flies past Venus-1962 CVA monthly meeting CSUF-east eng 191-7pm
15 Venera 7 lands on Venus-1970	16	17 Full Moon	18	19	20	21 Winter Solstice
22	23	24 Christmas Eve Apollo 8 orbits the moon-1968	25 Christmas Day	26 Kwanzaa Boxing Day in Canada and England	27	28 CVA star party at Eastman Lake
29	31	31 New Year's Eve	Jan 1, 2014 New Year's Day	2	3	4

What's New In Space-

Now Only One is Left-Scott Carpenter dead at age 88

Scott Carpenter, one of the original Mercury astronauts, died on October 10, 2013, in a hospice home in Denver, Colorado, NASA announced. The cause of death was due to complications from a stroke that he suffered earlier in the year. With Carpenter's passing, John Glenn, at age 91, is the last surviving member of the original seven Mercury astronauts. Ironically, Glenn was the oldest of the seven.

Carpenter was born Malcolm Scott Carpenter(he hated the name Malcolm, and rarely used it) in Boulder, Colorado, in 1926. His parents divorced when he was three, and he was raised by his maternal grandparents. He attended the University of Colorado, then joined the Navy as a reconnaissance aircraft pilot, flying missions along the Russian and Chinese borders in the 1950s. He was so good at it that he was sent to test pilot school, and then recommended as an astronaut candidate when NASA went looking for the first group in 1959. While going through astronaut qualification testing, he and John Glenn became best friends; they were also by far the two most physically fit of all the candidates, and both were selected (it was said that NASA was originally going to choose only six, but rumor has it that Carpenter and Glenn tied, so they both became astronauts).

Carpenter flew the fourth U.S. manned space mission, aboard Aurora 7, on June 24, 1962. The flight was controversial from the start: Donald "Deke" Slayton was originallyscheduled to fly it, but he was grounded with a minor heart anomaly, and Carpenter, as Glenn's backup on the Friendship 7 flight, took his place. Malfunctions with the spacecraft while in orbit caused it to overshoot the landing zone by 250 miles, and there were fears that the craft and pilot were lost. Although a NASA investigation absolved Carpenter of any blame for the problems, a number of influential people, including Christopher Craft, the lead flight director, blackballed him from any future flights. Afterwards, although he remained with NASA, Carpenter became involved with the Navy's Man-in-Sea program, eventually living for 30 days in an underwater habitat in 1968. He left both NASA and the Navy in 1969, and went into private business, and eventually returned to his home state of Colorado. In one of his last public appearances, he and Glenn appeared at the Kennedy Space Center in February 2012 for the 50th anniversary of Glenn's flight.

Scientists Outline Proposals for 2020 Mars Rover

In July, scientists and engineers from the U.S., ESA, and CNES(French Space Agency) submitted a series of recommendations for the rover that NASA will send to Mars in 2020. Foremost among them was a scientific lab package to search for biological evidence of life on the Red Planet. The 2020 rover will be based on the current Mars Curiosity rover, and will have the ability to travel over 25 miles across the surface of Mars. With the recommendations, NASA announced that the 2020 rover, which is so far unnamed, will be the first in a series of unmanned rovers paving the way for a manned mission to Mars around 2030 using the Orion/MPCV system which is now being developed. ESA and CNES are partners due to the fact that NASA is partnering up with a ESA/CNES rover that will go to Mars in 2018

Eight New Astronauts Announced-The Class of 2013

NASA announced eight new astronauts on June 18, four men and four women, who were chosen from over 6,000 applicants. Six of them are from the military, and two are civilian scientists. They are : Joshua Cassada-former Navy pilot; Victor Glover-Navy pilot; Tyler Hague-Air Force pilot; Christina Mammock-civilian scientist; Nicole Mann-Marine Corps fighter pilot; Jessica Meir-

(con't on next page)

Profiles in Astronomy

William Cranch Bond 1789-1859

Bond was born and raised in Maine, and as a young man had a particular interest in science. He witnessed a solar eclipse at age 17, and became an avid amateur astronomer afterwards; one of his early accomplishments was being one of the co-discoverers of the Great Comet of 1811. His father was an expert clock and watchmaker, and Bond followed him into that profession, which complemented his astronomical interests. The younger Bond eventually became an outstanding clockmaker himself.

In 1815, Bond became associated with Harvard College, which sent him on a trip to Europe to study major observatories there. Afterwards, he continued his work as a clockmaker combined with a growing reputation as an astronomer(when he built his house, he put his own personal observatory on the roof) over the next twenty years or so. In 1839, Harvard asked him to come to Cambridge as an astronomical advisor, and, in 1843, the school raised funds for him to build and direct an observatory on the campus grounds. It opened in 1847 with a 15" refractor telescope, one of the largest in the world at the time.

Using the 15", and later other telescopes that he procured for the Harvard Observatory, Bond made a number of important discoveries. In 1848, he discovered Saturn's moon Hyperion(it was seen at the same time by William Lassell in England; today, both men are given credit for it). He and his son George Bond also discovered the inner ring of Saturn, which has since been named the Crepe Ring, in 1850. Bond was also a pioneer in astrophotography, taking the first photographic image of a star(Vega) in 1850. As well, he did pioneering work in lunar studies.

A crater on the moon and an asteroid(Bond 767) are named after him. When he died in 1859, his son, George Philips Bond, a noted astronomer in his own right, became director of the Harvard Observatory.

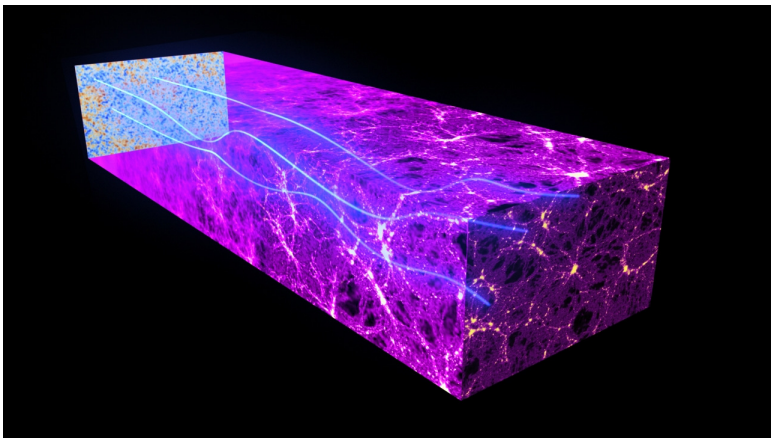
(from What's New in Space)

civilian scientist; Dr. Andrew Morgan-physican; and Anne McClain-Army helicopter pilot. The space agency indicated that they will probably not fly for several years at the earliest, given that NASA is currently sending astronauts up one at a time as paying passengers aboard Soyuz flights. But it did say that they will most likely go into space aboard commercial American spacecraft by 2017, and also fly missions to an asteroid and beyond in the 2020s. With the new additions, NASA currently has 57 people in the astronaut corps. With the end of the Space Shuttle program in 2011, many of the astronauts, realizing that there would be little chance of them going into space again at NASA, left for other ventures. Some of them are currently working for companies like Space-X and Sierra-Nevada, hoping to fly again in a few years aboard commercial spacecraft.

Space-X Has Competition

On September 18, Orbital Sciences Corporation successfully launched its Cygnus unmanned spacecraft to the International Space Station. It docked with ISS several days later, showing that it, too ,could deliver supplies to the space outpost. The Cygnus launch was notable in several respects: Space-X's Dragon now has competition for unmanned supply missions to ISS, and also, it was the first major orbital launch from NASA's Wallops Island launch facility in eastern Virginia, which, in the shadow of the Kennedy Space Center , and also Vandenburg Air Force Base, receives little publicity. Wallops Island is NASA's "other" space launch center, and has been around since 1945; only now is it coming into its own as a significant launch site(in a future issue, I will have a full-scale article on the history and logistics at Wallops Island).

Long-Sought Pattern of Ancient Light Detected



The journey of light from the very early universe to modern telescopes is long and winding. The ancient light traveled billions of years to reach us, and along the way, its path was distorted by the pull of matter, leading to a twisted light pattern.

This twisted pattern of light, called B-modes, has at last been detected. The discovery, which will lead to better maps of matter across our universe, was made using the National Science Foundation's South Pole Telescope, with help from the Herschel space observatory.

Scientists have long predicted two types of B-modes: the ones that were recently found were generated a few billion years into our universe's existence (it is presently 13.8 billion years old). The others, called primordial, are theorized to have been produced when the universe was a newborn baby, fractions of a second after its birth in the Big Bang.

"This latest discovery is a good checkpoint on our way to the measurement of primordial B-modes," said Duncan Hanson of McGill University in Montreal, Canada, lead author of the new report published Sept. 30 in the online edition of Physical Review Letters.

The elusive primordial B-modes may be imprinted with clues about how our universe was born. Scientists are currently combing through data from the Planck mission in search of them. Both Herschel and Planck are European Space Agency missions, with important NASA contributions.

The oldest light we see around us today, called the cosmic microwave background, harkens back to a time just hundreds of thousands of years after the universe was created. Planck recently produced the best-ever full-sky map of this light, revealing new details about of our cosmos' age and contents. A fraction of this ancient light is polarized, a process that causes light waves to vibrate in the same plane. The same phenomenon occurs when sunlight reflects off lakes, or particles in our atmosphere. On Earth, special sunglasses can isolate this polarized light, reducing glare.

The B-modes are a twisted pattern of polarized light. In the new study, the scientists were on a hunt for the kind of polarized light spawned by matter in a process called gravitational lensing, where the gravitational pull from knots of matter distorts the path of light.

The signals are extremely faint, so Hanson and colleagues used Herschel's infrared map of matter to get a better idea of where to look. The researchers then spotted the signals with the South Pole Telescope, making the first-ever detection of B-modes. This is an important step for better mapping how matter, both normal and dark, is distributed throughout our universe. Clumps of matter in the early universe are the seeds of galaxies like our Milky Way.

Astronomers are eager to detect primordial B-modes next. These polarization signals, from billions of years ago, would be much brighter on larger scales, which an all-sky mission like Planck is better able to see.

"These beautiful measurements from the South Pole Telescope and Herschel strengthen our confidence in our current model of the universe," said Olivier Doré, a member of the U.S. Planck science team at NASA's Jet Propulsion Laboratory, Pasadena, Calif. "However, this model does not tell us how big the primordial signal itself should be. We are thus really exploring with excitement a new territory here, and a potentially very, very old one."

Text and image from nasa.gov, Oct 21, 2013

Number of extra-solar planets found as of October 2013-1,010
How many more are out there?

(left) Orbital Sciences rocket balsting off from the Wallops Island launch center on September 18. (right) OS's Cygnus spacecraft being captured by the International Space Stations's remote arm prior to docking.
Images by NASA

Central Valley Astronomers of Fresno

Our Goals:

- **Provide a place for those interested in astronomy to come together and share their hobby**
- **Share the wonders of astronomy with the public**
- **Be a source of astronomy education and information for our schools, the public, and the media**

Our Interests:

- **To learn about astronomy and related topics**
- **To enjoy the nights sky with the unaided eye, telescopes, and binoculars**
- **To learn from others and share what we known about astronomy from others**

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Please submit articles in Microsoft Word format

Happy holidays and a wonderful 2014 to all of our CVA members and friends!