March-April
2012
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Issue 2

The Observer

The Newsletter of Central Valley Astronomers of Fresno

In this Issue:

CVA Calendar

March 10-CVA meeting 7pm CSUF

March 24-Messier Marathon at Eastman Lake

March 31-Public star party at Riverpark

April 7-CVA meeting 7pm at CSUF

April 20-22-CSUF Vintage Days

April 28-Public star party at Riverpark

Brilliant New Views of the Earth

This dazzling image of the Earth's western hemisphere was taken by the Suomi NNP satellite in January 2012, Soumi NPP was launched from Vandenberg AFB into a polar orbit on October 28, 2011; its mission is to monitor air pollution and climate change. More about Soumi NPP and its images inside.

Image-NASA

Astronomical Quote of the Month-

...The vastness of the heavens stretches my imagination-stuck on this carousel my little eye can catch one million year old light.

Richard Feynman, from *The Feynman lectures on Physics*, 1961

Full Moon March 8 | New Moon March 22 | Full Moon April 6 | New Moon April 21

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The Observer is the newsletter of the Central Valley Astronomers of Fresno- Established 1952

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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CVA members-
Spring is coming!
Get your telescopes ready for the Messier Marathon on March 24, Riverpark public viewing
on Saturdays starting March 31,
And good viewing throughout the summer!

Profiles in Astronomy

Andrew Common 1841-1903

Common was born in Newcastle-upon-Tyne in England in 1841. His father was a surgeon who died when Andrew was young; as such, the boy quit school to work to help support the family. Several years later, an uncle gave him a position in his engineering firm; Common worked for the company for the rest of his career, until his retirement in 1890, and lived quietly until his death in 1903.

Common had no university degree, and astronomy was a merely an amateur's hobby for him. Nevertheless, he pioneered the craft of astrophotography. As a boy, he was interested in astronomy, and his mother borrowed a telescope from a local doctor for him to use. In his 30s, after his engineering position had become established, he returned to astronomy, bought a 5.5" refractor, built a frame on it to hold a camera, and began taking pictures of the moon and the planets using gelatin-covered glass plates. In 1876, he became a Fellow of the Royal Astronomical Society. The same year, he moved to Ealing, a town just outside of London, constructed his own observatory in his backyard, and began building his own reflector telescopes. In 1878, based on observations with a homemade 18" reflector, he made and published photographs of the planets.

In 1879, Common bought a 36" mirror and built a frame for it in his observatory. Over the next several years, among other things, he studied Minas, the moon of Saturn, and determined that its orbit had been incorrectly calculated; and took the first photographs of a comet, C 1881/K1. Between 1880 and 1884, he took a series of long exposure photographs of the Orion Nebula, M41, which showed it in detail never before seen. These images earned Common the Gold Medal of the Royal Astronomical Society. Eventually, he sold the 36" to British politican Edward Crossley; it would ultimately become the 36" Crossley reflector at Lick Observatory in California.

In 1885, Common bought a 60" mirror blank, and attempted to grind and polish it for his next telescope. However, he had problems with the curvature, and a second 60" mirror was unsuccessful as well. He put both aside and went on to other projects. After his death, his estate sold the mirrors to the Harvard Observatory. They were sold again in 1933, and are now at the Boydon Observatory in South Africa.

Common's observatory in the back yard of his house In Ealing. The centerpiece of it is his 18" reflector, which he used to take his pioneering astrophotos

Common's best known image, that of the Orion Nebula, M42' which he took in 1883, and which won him the gold medal of the Royal Astronomical Society.

CVA Calendar March-April 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8 Full Moon	9 Discovery of active volcanoes on Jupiter's moon Io-1979	10 Discovery of the rings of Uranus-1977 CVA monthly meeting at CSUF-EE191-7pm
11	12	13 William Herschel discovers Uranus-1781	14 Pi Day	15 The Ides of March-Beware, Caesar!	16	17 St. Patrick's Day
18 First spacewalk by Alexi Leonov-1965	19	20 Spring Equinox	21	22 New Moon	23 Comet Shoemaker-Levy 9 discovered-1993	24 Messier Marathon at Eastman Lake
25 Titan, Saturn';s largest moon discovered-1655	26	27	28	29	30	31 CVA public star party at Riverpark
April 1 April Fool's Day Palm Sunday	2	3	4	5	6 Full Moon Good Friday	7 First Day of Passover CVA monthly meeting at CSUF EE191 7pm
8 Easter Sunday	9	10	11	12 First manned spaceflight-Yuri Gagarin-1961 First Space Shuttle flight-1981	13	14
15	16 IRS Tax Day	17	18	19	20	21 New Moon Vintage Days at CSUF Messier Marathon #2
22 Earth Day	23	24	25 Hubble Space Telescope deployed -1990	26	27 Arbor Day	28 Astronomy Day CVA Public starparty at Riverpark
29 Astronomy Week Begins	30	May 1 May Day	2	3	4	5

Suomi NPP Provides Dramatic New Views of the Earth

The Suomi NPP (for National Polar Orbit Partnership) satellite was launched on October 28, 2011 from Vandenberg Air Force Base in Southern California. It is joint venture between NASA and NOAA, the National Oceanographic and Atmospheric Administration, and is being managed by the Goddard Space Flight Center near Washington D.C. The spacecraft was named after the late Verner Soumi, a meteorologist at the University of Wisconsin, and is the latest and newest in a series of Earth Sensing satellites whose goal is to monitor the planet for environmental patterns and changes. Already, though, it has made its mark with awe-inspiring images of the Earth, the latest version of the "Blue Marble" as seen from space. The imager here, as well as the one on the front cover, were taken by Suomi NPP in a series of scans on January 8-9, 2012, and released by NASA a few weeks later. Currently, Suomi NPP is in a polar orbit 512 miles above the Earth, and is scheduled to operate for the next three years.

Right-an image of the eastern hemisphere taken by Suomi NPP in January 2012

Below left-an image of Suomi NPP

Below right– A Delta II carrying Suomi NPP being launched from Vandenberg AFB on October 28, 2011

Number of extra-solar planets found as of February 2012-760

How many more are out there?

What's New in Space

2013 Federal Budget Rips out Mars Exploration Programs

On February 11, President Obama released the 2013 federal budget, and NASA's share of it was cut. In fact, the Mars exploration program, one of the space agency's jewels now that the shuttle program is gone, was severely hit. Currently, NASA's 2013 budget is $17.7 billion, $59 million down from 2012. In particular, the Mars program budget was cut from $1.5 billion to $1.2 billion, which space agency officials say will eliminate two missions, in 2016 and 2018, which were intended to be flown in partnership with the European Space Agency. The latter one was being proposed as a soil and rock return mission. Planetary scientists, especially those who have deeply involved in the Mars series of robotic missions, expressed shock and dismay, claiming that the U.S. is abandoning planetary exploration. They are hoping that the funding will be restored by Congress. On the other hand, NASA's funding for commercial space missions was almost doubled, from $450 million to $830 million. President Obama has been a strong advocate of the commercialism of space flight by the private sector, and plans for NASA to eventually fly American astronauts to ISS aboard American commercial spacecraft. However, the first manned flights of vehicles such as Space-X's manned Dragon and Sierra-Nevada's Dreamchaser manned craft has been pushed back to at least 2015 due to funding delays.

Space-X Dragon Spacecraft Prepares for ISS Mission

In December 2011, Space-X announced that it will conduct an ISS docking mission with its unmanned Dragon spacecraft in early 2012. The flight was originally scheduled to be launched in February 2012. But has now been rescheduled for April. Dragon will be launched atop a Falcon 9 rocket from Cape Canaveral, carry about 5,000 pounds of cargo t ISS and, dock with it. Astronauts will unload the capsule, then fill it with materials to be returned to Earth. The craft will splash down in the Pacific about a week after launch. If all goes well, under a contract signed with NASA, Dragon will start making regular flights to ISS as an unmanned cargo carrier; 2 in 2013, 3 in 2014, and 4 in 2015 and 2016.

In the meantime, Space-X has received approval from NASA to build a man-rated version of Dragon, and plans to have it ready for manned flights by 2016. Space-X has hired former shuttle astronaut Ken Bowersox to head up its manned spacecraft program, and to begin procedures for eventually selecting, hiring, and training pilots to fly the craft. The company did not say when they would be chosen.

Space-X, in conjunction with NASA, is also beginning work on what it is calling the "Red Dragon" program, using a modified Dragon spacecraft and its recently announced heavy lift booster for a possible eventual flight to Mars. This would be unmanned, and if, Congress agrees to the lower expenditure, might be launched as early as 2018. Unlike previous Mars flights, this would be a return mission that would take up to two years. Much, of course, depends on NASA's budget, which(as noted above) has been cut.

China Announces Space Goals for the Next Five Years

In the meantime, the Chinese Space Agency has announced an ambitious program of manned and unmanned space missions over the next five years, intended to challenge the U.S. and Russia in space exploration. They are planning a whole series of manned space flights over the next few years, which will lead to a permanently manned space station by 2018, and a possible lunar landing mission by 2020.

In unmanned space flight, and as preparation for manned missions, the Chinese have said that they will launch an unmanned lunar rover which will scoop up and return soil and rock samples to Earth. This mission is being planned for 2016

John Glenn and NASA Celebrate the 50th anniversary of his Epochal Flight

February 20 was the 50th anniversary of John Glenn's Mercury flight, and to commemorate it, Glenn and the only other surviving Mercury astronaut, Scott Carpenter, appeared at the Kennedy Space Center and talked about the early days of manned spaceflight. Glenn, now 90, and still in good health, said that he remembered that day as clearly as ever, the excitement and the worry as well. He and Carpenter toured the old Mercury facilities and spoke to thousands of employees and guests. Glenn praised the original Mercury team, several of whom also appeared at the ceremony, and strongly criticized President Obama's decision to end the Shuttle program, saying it was "a terrible mistake." NASA chief administrator Charles Bolden, a former shuttle astronaut, also spoke, saying that he, too, was disappointed over the end of the shuttle program, but reminded people that the U.S. and NASA must move on to other space goals.

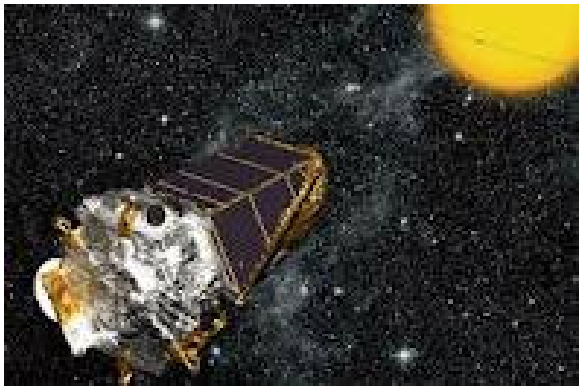
A note from the editor-

On February 20, 1962, I was a nine year old schoolboy, living in Kirkwood, a suburb of St. Louis. Although I did not know of St. Louis' connection to the space program(the Mercury and Gemini spacecraft were built at then McDonald Aircraft, later McDonald-Douglas, and now Boeing, a few miles away in North St. Louis) at the time, I felt the excitement, along with my classmates and teachers; all we did that day was watch TV, from the launch to the splashdown. And, of course, it was all over the papers the next day. I was already in love with space; I had watched a Disney program around 1960, which focused on the coming space age, and the satellites and the eventual people who would go into orbit. But Glenn's flight was for me, and probably millions of others, confirmation that it was really happening, that humans were orbiting the Earth, and would eventually go to the Moon. The Space Age became concrete that day. And when he came back after a scare involving a false sensor reading on the heat shield, he was admired from coast to coast, the new American hero who dared the unknown and came back.

A *Newsweek* article several years ago looked back on the early days of the space program and concluded that the seven original Mercury astronauts, and Glenn in particular, were the last American heroes, before Vietnam, before Watergate, before the advent of "personality journalism" that ripped peoples' lives apart in search of the next big story, before the long era of American self-doubt about its goals and abilities. Even some of the "Sacred Seven" were afterwards found to be less than immaculate, with their womanizing and drinking and recklessness. Glenn, though, was the one who always stood out: the "Clean Marine," dedicated to family, faith, and country, like very few of the astronauts ever were. Respect and admiration for Glenn was so high that, as he learned many years later, President Kennedy and later President Johnson blocked his requests for another flight because they considered him too important a symbol to be risked in space again. Eventually, he left the space program and the Marines, became a soft drink executive, then a U.S. senator, and, in 1984, briefly ran as a candidate for president. Not until 1998, when he talked NASA into investigating the affects of spaceflight on the aging process did he go into space again, aboard a shuttle mission at the age of 77. Even then, it was less about the scientific research to be gained than the name of Glenn, still magic, still creating a stir in the American psyche. Hundreds of thousands came to the Cape to watch the launch, and millions followed the mission as it unfolded. After 36 years, the excitement was in the air once again.

Those who attended the 50th anniversary ceremonies at the Cape, and watched and listened to Glenn(and also Scott Carpenter, who reenacted his famous words as capsule communicator, "Godspeed, John Glenn"), said later that they felt that same excitement and thrill. Even reporters covering the events said that there was something in the air that they had rarely known or felt before, a sense that this country was good and right after all, and capable of doing anything it set its mind to. Maybe *Newsweek* was correct: Glenn was, and is, the last American hero, with his reverence to ideas far above himself, and when he is finally gone, whether, in this narcissistic and tragic culture, there will ever be another like him.

NASA'S KEPLER ANNOUNCES 11 PLANETARY SYSTEMS HOSTING 26 PLANETS



NASA's Kepler mission has discovered 11 new planetary systems hosting 26 confirmed planets. These discoveries nearly double the number of verified planets and triple the number of stars known to have more than one planet that transits, or passes in front of, the star. Such systems will help astronomers better understand how planets form.

The planets orbit close to their host stars and range in size from 1.5 times the radius of Earth to larger than Jupiter. Fifteen are between Earth and Neptune in size. Further observations will be required to determine which are rocky like Earth and which have thick gaseous atmospheres like Neptune. The planets orbit their host star once every six to 143 days. All are closer to their host star than Venus is to our sun.

"Prior to the Kepler mission, we knew of perhaps 500 exoplanets across the whole sky," said Doug Hudgins, Kepler program scientist at NASA Headquarters in Washington. "Now, in just two years staring at a patch of sky not much bigger than your fist, Kepler has discovered more than 60 planets and more than 2,300 planet candidates. This tells us that our galaxy is positively loaded with planets of all sizes and orbits."

Kepler identifies planet candidates by repeatedly measuring the change in brightness of more than 150,000 stars to detect when a planet passes in front of the star. That passage casts a small shadow toward Earth and the Kepler spacecraft.

Each of the new confirmed planetary systems contains two to five closely spaced transiting planets. In tightly packed planetary systems, the gravitational pull of the planets on each other causes some planets to accelerate and some to decelerate along their orbits. The acceleration causes the orbital period of each planet to change. Kepler detects this effect by measuring the changes, or so-called Transit Timing Variations (TTVs

Planetary systems with TTVs can be verified without requiring extensive ground-based observations, accelerating confirmation of planet candidates. The TTV detection technique also increases Kepler's ability to confirm planetary systems around fainter and more distant stars.

Five of the systems (Kepler-25, Kepler-27, Kepler-30, Kepler-31 and Kepler-33) contain a pair of planets where the inner planet orbits the star twice during each orbit of the outer planet. Four of the systems (Kepler-23, Kepler-24, Kepler-28 and Kepler-32) contain a pairing where the outer planet circles the star twice for every three times the inner planet orbits its star.

"These configurations help to amplify the gravitational interactions between the planets, similar to how my sons kick their legs on a swing at the right time to go higher," said Jason Steffen, the Brinson postdoctoral fellow at Fermilab Center for Particle Astrophysics in Batavia, Ill., and lead author of a paper confirming four of the systems.

Kepler-33, a star that is older and more massive than our sun, had the most planets. The system hosts five planets, ranging in size from 1.5 to 5 times that of Earth. All of the planets are located closer to their star than any planet is to our sun. The properties of a star provide clues for planet detection. The decrease in the star's brightness and duration of a planet transit, combined with the properties of its host star, present a recognizable signature. When astronomers detect planet candidates that exhibit similar signatures around the same star, the likelihood of any of these planet candidates being a false positive is very low.

"The approach used to verify the Kepler-33 planets shows the overall reliability is quite high," said Jack Lissauer, planetary scientist at NASA Ames Research Center at Moffett Field, Calif., and lead author of the paper on Kepler-33. "This is a validation by multiplicity."

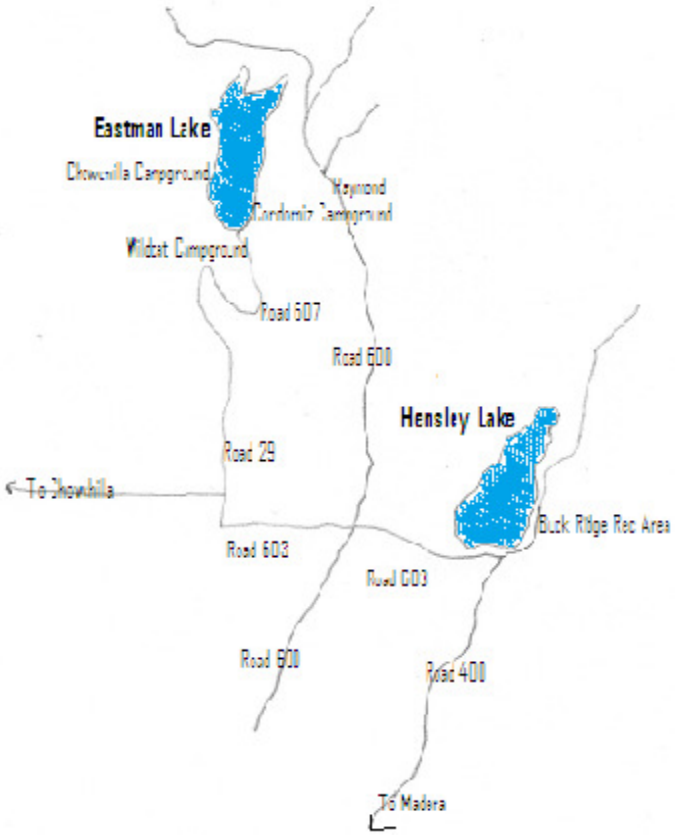
Astronomical Trivia

Last issue's trivia question-"What was it that Galileo observed in 1611, noted in his journal, and then forgot about, something that could have changed the history of astronomy?"

The answer is the planet Neptune. From his notes and observations, scientists are certain that he observed it, but then inexplicably discarded the idea that it might be a new planet, saying simply that it was an odd star-like object. Some scientists believe that he also observed Uranus, but are less definite about it. Uranus was finally observed and recorded by William Herschel in 1783, and Neptune was jointly found by John Couch Adams, Anton LeVerrier, and Johann Gall in 1846.

This issue's trivia question-

What were the names of the Daughters of Atlas, the names that we today give to the seven brightest stars in the Pleiades?



To Hensley and Eastman Lakes-Star party sites. The Eastman Lake star-watching site is at the boat ramp at the end of Road 29, just past the Cardinez campground.

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Deadline for articles submission for the May-June 2012 issue-
April 15

Astronomy Short

Bernard Schmidt was born and raised on an island off the coast of Estonia, and as a boy, lost one arm in an accident while mixing explosives. Unsociable and taciturn, he eventually made his living building telescopes at the Hamburg Observatory in northern Germany. In 1929, the observatory sent him and Walter Baade, a young staff astronomer, to observe a solar eclipse in the South Pacific. While on the sea voyage, Schmidt told Baade that he had an idea for a new kind of telescope, one that would be in perfect focus from one edge of the field to the other. After returning to Germany, Schmidt borrowed a book on optics from Baade, and created a suction device from a pump and a cooking pot. He laid a circular glass blank on top of the pot, sucked all the air out of it until the glass sagged, and then spent the next several days alone in his workshop grinding and polishing the glass to flatness again. When he let the air back in the pot again, the glass popped back, creating a toroidal rippling shape. Schmidt put what he called the corrector glass and a spherical curved mirror in a telescope tube, rigged up a prism and an eyepiece, and that night he and Baade pointed it at a cemetery about a mile away. They could read the names on the gravestones in clear brilliant detail. In fact, it was a moonless night; the light came solely from the stars in the sky. This was the first Schmidt Camera, a device which revolutionized astrophotography.

Baade took a position with the Mt. Wilson Observatory in Southern California a few years later, and among his projects there was the building of the largest ever Schmidt Camera, with a 48" corrector glass, on Palomar Mountain, which saw first light in 1947, and is still used today.