Club News

December, 2002

John Kocijanski, Editor

Jim McKeegan, President
John Kocijanski, Vice President
Brian Deis, Secretary
Bud Wertheim, Treasurer

Brian Deis has volunteered to be our club secretary. Brian is from Chester and built his own observatory. He has invited the club down to see it on December 7th. We will hold our regularly scheduled observation session there instead of at Walnut Mountain. The meeting will be held regardless of sky condition. If it does turn out to be clear then Brian doesn't mind if members to bring their own scopes. Directions to his house are listed below.

Directions from the north: Take route 17 East to exit 126.
Turn Left at the stop sign. You're now on Rt 94. Drive about 1.8 miles. You'll see at yellow handicap sign on the right. I'm the first driveway on the right after the sign. The number 4194 is on the mailbox.

Directions from south of Chester.

Take Rt 17 West to exit 126. Turn left at the first light (17M) Turn Left at the next light. (Rt 94) Drive 2 miles. You'll see at yellow handicap sign on the right. I'm the first driveway on the right after the sign. The number 4194 is on the mailbox.

The driveway is about 600 feet up a grade. The observatory is in the back left.

My phone number is (845) 651-2671

Brian

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The club would like to hold a few indoor meetings on Saturdays during the winter. We are looking for a place to hold them. We held a few meetings at Sullivan County Community College during weekdays but it would probably be more convenient for members if they were held on Saturdays. Members homes have been suggested as well as the Blue Horizon Diner in Monticello. Anyone else have any suggestions?

The November 2nd and 30th observation sessions were cancelled due to cloudy skies.

The next December club observation session after the 7th is on the 28th at Walnut Mountain.

Astronomy News:

FAST-FLYING BLACK HOLE YIELDS CLUES TO SUPER-NOVA ORIGIN

A nearby black hole is hurtling like a cannonball through the disk of our galaxy. The detection of this speed demon is the best evidence yet, some astronomers say, that stellar-mass black holes — those that are several times as massive as the Earth's Sun — are created when a dying, massive star explodes in a violent supernova. The stellar-mass black hole, called GRO J1655-40, is streaking across space at a rate of 250,000 miles per hour, which is four times faster than the average velocity of the stars in that galactic neighborhood. At that speed, the black hole may have been hurled through space by a supernova blast. Even though, by definition, black holes swallow light, the runaway black hole has a companion star, allowing astronomers to track it. NASA Hubble Space Telescope's sharp view allowed astronomers to measure the black hole's motion across the sky in images taken in 1995 and 2001.

To see and read more, please click on
http://oposite.stsci.edu/pubinfo/pr/2002/30
http://oposite.stsci.edu/pubinfo/latest.html
http://oposite.stsci.edu/pubinfo/pictures.html
http://hubblesite.org/go/news and
http://hubble.esa.int

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Dark Rings
NASA Science News
November 8, 2002

Many years ago Pioneer 11 flew through Jupiter's rings, but no one

knew it at the time. This week NASA's Galileo spacecraft did it again ... and scientists were ready.

In 1974, NASA's Pioneer 11 spacecraft plunged through the rings of Jupiter.

And no one noticed.

Jupiter's dark rings—as wide as Saturn's yet nearly invisible—hadn't been discovered yet. Indeed, it wasn't until five years later that cameras onboard Voyager 1 caught sight of them for the first time. On Mar. 5, 1979, the spacecraft swung behind Jupiter, and from inside the planet's shadow the faintly sunlit rings were visible—but just barely. Ever since, researchers have wished for another flyby like Pioneer 11's. NASA's Voyager, Cassini and Galileo spacecraft have photographed the rings many times, but always from a distance. No probe had actually entered the rings for 28 years.
Until this week.

On Nov. 5, 2002, Galileo took the plunge and flew through Jupiter's rings again. And this time scientists were ready.

"We've been looking forward to this flyby for a while," says Joe Burns, a planetary scientist at Cornell University and a member of the Galileo imaging team. "It's an opportunity to study the particles that make up these rings and to learn about their environment."
Galileo is nearing the end of its twice-extended 7-year mission to Jupiter. Risky maneuvers like flying through Io's volcanoes and Jupiter's rings were
saved for last. This week's ring encounter and close-approach to Jupiter is
one of the final things Galileo will do before it plunges into Jupiter itself next year.

Unlike Saturn's rings, which are made of bright, icy chunks as

large as houses, Jupiter's rings consist of fine dust akin to the particles in cigarette smoke. The dust grains are dark (they reflect barely 5% of the sunlight that hits them) and they are spread so thin that the rings are almost transparent. This is what makes the rings so hard to study.

The origin of Jupiter's rings was revealed by Galileo's cameras more than five years ago. "The dust comes from small rocky moons orbiting Jupiter," says Burns. These moons are constantly pelted by meteoroids, which burrow into the ground and explode. Jupiter's rings are the debris from those impacts.

In fact, Jupiter has several rings: The main ring is the brightest. It's close to Jupiter and made of dust from the satellites Adrastea and Metis. Two wide gossamer rings encircle the main ring. These come from the satellites Thebe and Amalthea. There is also an extremely tenuous and distant outer ring that circles Jupiter backwards. No one is certain, but that ring might be made of captured interplanetary dust.

When Galileo approached Jupiter last Tuesday, it passed through one of the gossamer rings. The spacecraft's close approach to Amalthea on the same day was much-anticipated by scientists who will figure out the mass of that moon from its gravitational tug on Galileo.

Saturn's rings probably formed from the total breakup of an icy moon about the size of Amalthea (100 km wide). Jupiter's rings, on the other hand, are merely dust from the surface of such moons. "Saturn's rings are millions of times more massive than Jupiter's," notes Burns. Meteoroids have been striking Jupiter's moons and kicking up dust for billions of years. So why isn't there more "stuff" in Jupiter's rings? Why are Jupiter's rings so much less massive than Saturn's?

Burns explains: "Dust grains ejected into Jupiter's rings don't stay in the rings forever. The grains spiral in toward Jupiter and eventu-

ally disappear." They lose orbital energy for several reasons: Sunlight is one. Dust grains absorb and re-emit sunlight, losing momentum in the process. Scientists call this "Poynting-Robertson drag."

Plasma collisions are another reason. Jupiter's magnetosphere (a magnetic bubble that surrounds the planet) is filled with electrified clouds called plasmas. The dust grains in the rings are themselves charged—like the static-charged dust that accumulates on your computer screen. When charged grains collide with plasma clouds, the grains can lose orbital momentum.

The "age" of Jupiter's rings depends on which of these mechanisms dominates. Plasma collisions might de-orbit ring particles in only a few years. Poynting-Robertson drag, which Burns favors, takes longer, perhaps 100,000 years. (The age of Saturn's rings is likewise controversial. Read Science@NASA's "The Real Lord of the Rings" for more information.)

Jupiter's rings are constantly replenished by meteoroid impacts, so they won't disappear any time soon. Next year's rings, however, might be made of different "stuff" than this year's. In that sense, Jupiter's rings might be younger than you are.

When Galileo flew through the rings this week, the spacecraft's suite of electromagnetic sensors and its Dust Detector were working well. (The spacecraft itself, bombarded by radiation from Jupiter, went into safe mode near the end of the ring encounter, but not before data had been collected.) Burns hopes the unprecedented in situ measurements will finally solve the puzzle.

Or they might reveal more surprises. Jupiter's dark rings remain, after all, unexplored territory.

Note: Galileo left Earth aboard NASA's space shuttle Atlantis in 1989. JPL, a division of the California Institute of Technology in Pasadena, manages the Galileo mission for NASA's Office of Space Science, Washington, D.C.

http://www.nearearthobjects.co.uk/
news_display.cfm?code=news_intro&itemID=137

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First UK Impact Layer Discovered
Matthew Genge, NEO Information Centre
November 14, 2002

In an article published today in the journal Science researchers led by Dr. Gordon Walkden of Aberdeen University have reported the discovery of a 214 myr old impact layer in the rocks of the west of England. The 2cm thick layer consists of millimetre-sized green spherules that were formed as molten droplets of rock in the impact of a large asteroid or comet with the Earth. The droplets formed by condensation from gases generated by vaporisation of rocks at enormous temperatures and were scattered over the entire Earth surface.

Speaking to the NEO Information Centre, Walkden said “I discovered the layer in 1983 but didn’t realise it was an impact layer until the late 1990s.” Mr Julian Parker, from Aberdeen, studied the spherule layer with Walkden and discovered quartz grains that had been deformed by intense pressures. “The orientation of the distorted planes through the grains showed they had been shocked,” said Walkden, “and prove the layer was formed as debris thrown out from a giant collision.”

Dr Simon Kelly, from the Open University, measured the age of the west country spherule layer using the decay of radioactive potassium, that is found in all potassium-bearing minerals. The age of 214 myrs is the same as the 100 km wide Manicouagan Crater in Canada which is, therefore, the likely source of the impact layer. Kelly, however, suspects that a number of craters that have similar ages may have formed at the same time as a string of impacts.

At the time, 214 myrs ago, early dinosaurs and mammals lived in, what was then, the red arid deserts of Southwest Britain. The fall

of the spherules, which may have still been molten, and the other effects of the impact did not, however, cause a mass extinction. The animals of the Triassic period were not affected and survived until 13 million years later when many became extinct for an, as yet, unknown reason.

”The lack of a mass extinction,” says Gordon, “suggests that in large impacts, where the collision occurs is just as important as its size.” The impact at Chicxulub 65 myrs ago, that is widely believed to have caused the extinction of the dinosaurs, occurred into carbonate and sulphate rocks and it is thought that the gases generated by the impact caused climatic changes that resulted in the extinction.

The location of the impact layer is currently being kept secret in order to protect it. Specimens of the layer, however, are being put on public exhibition at the Natural History Museum in London, at the NEO Information Centre at the National Space Centre in Leicester, and the National Museum of Scotland, Edinburgh. Dr Gordon Walkden is also taking part in a public discussion on impacts and mass extinctions, together with Dr Matthew Genge from Imperial College, at 2.30 pm GMT on Nov 15 at the Darwin Centre of the Natural History Museum. This discussion will be broadcast live on the internet and at the National Space Centre, Leicester and the National Museum of Scotland, Edinburgh.

http://www.psrd.hawaii.edu/Nov02/EuropanBands.html

Bands on Europa
Planetary Science Research Discoveries
November 25, 2002

— Rifting at Earth’s mid-ocean ridges is a good analogy for Europan band formation.

Written by Linda M.V. Martel

High-resolution Galileo images of Jupiter's icy moon Europa show linear, curved, and wedge-shaped bands crisscrossing the surface. The bands are one of five primary terrain types previously mapped on Europa; the other types are plains, chaos, ridge, and crater materials [see PSRD article: The Europa Scene in the Voyager-Galileo Era.] Now a team of scientists from the Applied Physics Lab (APL), Brown University, Cornell University, the Nordic Volcanological Institute (Iceland), and the Institute of Planetary Exploration (Germany) have made detailed maps of five distinct bands. Louise Prockter (APL) and her colleagues compare the Europan bands to Earth's mid-ocean ridges. They discuss fast-spreading and slow-spreading models for the Europan bands showing how warm ice may have welled up to the surface through fractures. The team concludes that mid-ocean ridge rifting is a good analogy for Europan band formation, that bands were responsible for hemisphere-wide resurfacing on Europa, and that the style of resurfacing has changed over time.

Reference:

Prockter, L. M., J. W. Head III, R. T. Pappalardo, R. J. Sullivan, A. E. Clifton, B. Giese, R. Wagner, and G. Neukum (2002) Morphology of
Europan bands at high resolution: A mid-ocean ridge-type rift mechanism, Journal of Geophysical Research, 107(E5), 10.1029/2000JE001458.
Full story here:
http://www.psrd.hawaii.edu/Nov02/EuropanBands.html

http://www.lanl.gov/worldview/news/releases/archive/02-127.shtml

Los Alamos National Laboratory
News and Public Affairs
Los Alamos National Laboratory
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Mid Evening Observing Highlights for December

Saturn can be found in the eastern sky in Taurus. Orion and Gemini are rising in the east. Auriga and Taurus are higher in the eastern sky. Auriga contains the open clusters M36, M37, and M38. The open cluster M34 can be found in the northeastern sky between Andromeda and Perseus. The Double Cluster is high in the northern sky between Cassiopiea and Perseus. The bright star Aldebaran can be found in Taurus. The Andromeda Galaxy is almost directly overhead. The Great Square is moving into the western sky. The Milky Way stretches from the east to west. Cygnus is setting in the western sky. Full moon is on December 19th and new moon is on December 4th. The Geminid meteor shower will peak on the morning of the 14th.

Observations and Photographs

If you are interested in submitting an observation or photograph please contact John at kocis@catskill.net.

This picture of the last gibbous moon was taken by John Kocijanski with an Olympus D-550 three megapixel digital camera through a 40 mm Orion Sirius plossl eyepiece with an Orion XT 4.5 dobsonian reflector. No zoom or filter was used. The camera was set at minimum brightness.

Barlow Bob is a member of the Rockland Astronomy Club.

These American Indian story come from Audrey Salvatore of RAC.

Rabbit on the Moon

How many have ever seen the full Moon? (Pause)

Well one night Rabbit saw a full moon and thought how great it would be to ride the moon across the sky. (Use hands to show the moon crossing the sky). He thought, if I ran up a big hill and jumped up. I could catch the moon and ride it across the sky.

So— one night he tried and of course he couldn't reach it. So he decided he would ask the Hawk I he could fly him up to the moon, so he could ride it across the sky. When he asked Hawk. The hawk said he couldn't fly that high. But he should ask the Eagle because he could really fly high.

So Rabbit went and asked the Eagle if he could fly him up to the moon, so he could ride it across the sky. The Eagle said that he could really fly high. But NOT THAT HIGH.

Well poor Rabbit he was so sad and he went and asked all the little birds if they could fly him up to the moon so he could ride it across the sky. Well the little birds all laughed, how could they reach the moon? Rabbit started to cry, he really wanted to ride the moon across the sky. The Crane bird was listening, and said. That he had really BIG wings. Maybe he could fly Rabbit up to the moon. Do you really think so said Rabbit? Well! we could give it a try. Grab hold of my legs and we'll try. So the Crane bird started to flap, and flapped again and again. (I flap my arms and talk softly then flap faster and get louder) He started to come off the ground so he flapped faster and faster. Before you know it he reached the moon. Rabbit was sooo happy. He thanked the Crane bird and said he was giving Crane a present of red feathers. He touched the Crane on

the top of his head and the feathers on the top of his head turned all red. If you look at a Crane bird today you will see that he still has red feathers on the top of his head. But while he was flying up to the moon with Rabbit holding his legs Rabbit got heavier and heavier, and stretched and stretched Cranes legs, so that the Crane Bird has the longest legs of all the birds.

The best part of this story is: that if you look up at the full Moon, You will see the Shadow of the Rabbit on the Moon.

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Try to come out to our observational nights and meetings. We look forward to having as many members participate as possible. It is a learning experience for all of us at whatever level of expertise we possess. Each experience has been varied and different. As the nights change so do the challenges.

As we have demonstrated, the size of the telescope is irrelevant as each size has it's advantages. The small scopes show many more stars (a wider angle of viewing), the larger ones show more detail. The long focal lengths have greater magnification but the faster ratios allow for faster photographic imagary.

A good pair of binoculars work well for many of the subjects, so it isn't the equipment, it's the knowledge of what to look for and when. Come out and join us.