Nightfall

Monthly publication of the Huachuca Astronomy Club

FEBRUARY 2015

President's Notes

What Do Our Dues Do?

Well it's the start of a new year, 2015. You probably already know this, so I'm sorry for saying it again, but if I don't repeat the facts regularly, some may not really know what we do with their dues.

The Huachuca Astronomy Club is a not for profit organization. We try to be frugal. We look to keep ahead of club expenses and only plow the money into outreach, new member packets, and to ply our wonderful speakers with a modest dinner before coming to give us informative talks. That's about it.

We are fortunate to have partners who donate resources and goods: space for our meeting venues (Cochise College and UA South Foundation), and products from astronomy retailers like Starizona and Farpoint to use as door prizes. When necessary, we may purchase an item of general interest (although we've not done so in several years).

Outreach and general meeting expenses for the last few years have come down to insurance, website costs, speaker dinners, solar viewers, and printing. We never charge for our time, mileage, food, or drinks; and we no longer need to print and mail newsletters. The donations for drinks and snacks don't always cover the cost for the cookies and drinks that Katherine and Bill bring to each meeting but it is hard to get them to take club money. We have only been able to give them our thanks. For outreach events at schools, parks and libraries we may bring a few telescopes that have been given to the club over time, but, for the most part, members bring and share their own equipment.

New member packets are a cost we believe in strongly. They provide information that is immediately useful to new members, and include items, such as the planispheres, that go right on giving for years. Membership in our club also enrolls you into membership in the Astronomical League and gives you all the perks that entails.

Our primary form of income comes from your yearly membership dues. We tend to just break even on the shirts, calendars, and handbooks. We do try to solicit donations at outreach events and public nights at the Patterson, but we are not salespersons, so we don't push it.

Did I mention you can make deductible donations to the club?

We also get a trickle in from Amazon sales through our website portal (did I mention how easy it is to click on the Amazon icon on our website?).

Anyway, over the last couple of years, we have just about broken even, and that's good. We have some new members and that is good for the bank, as well as always being a welcome gyration to club dynamics. If you want a look at the real numbers, we bring the latest bank statement to the monthly meetings; just ask. We, the board, worry about budget. That's what we do. As you can tell, your membership funds are crucial to sustaining our activities, and the board tries to be judicious with their use. Every donation and all the volunteered time and effort by members is also crucial and much appreciated, but the membership dues are also crucial to keep our activities going, and so that is why we bug you every year for dues.

Thank you for your continued support,

David Roemer, President

New Members Corner

Joining last month, we welcome Chris Stoecklin of Hereford. We had three new member applications turned in at the January Patterson Public Night: Bonnie and Nathan Hall and children joined. The Halls, who reside in Bisbee, were the winners of the grand prize at our first telescope clinic last year. Scott Smith and Anne Borowiec of Sierra Vista joined. Anne serves on the University South Foundation board of directors. Scott Ritchey of Sierra Vista is our newest military member. Daniel Ivanich and Joseph and Carol Kamai, all of Sierra Vista, joined at the February 6 general meeting. Welcome to the club, we are glad you joined!

March Meeting

Our March meeting will be held at 7PM on Friday March 6. The meeting will be held in the **main lobby area of the Cochise College Library**. This is a change of venue due to the unavailability of our usual meeting location. Please note that previous announcements and event schedules had this meeting scheduled for the Patterson Observatory. That location is considered too small for the expected turnout. The lobby area of the Cochise College library can accommodate a significantly larger number of attendees.

The presentation for the March meeting will feature two distinguished speakers, Rik and Dolores Hill. Rik's talk will detail the near Earth asteroid search program of the Catalina Sky Survey. Rik has been on the CSS team since 1999. Dolores is a meteoriticist at the University of Arizona's Lunar and Planetary Laboratory. She will bring us up to date on the latest exciting news from the OSIRIS REx asteroid sample return mission that will launch toward the small asteroid Bennu in 2016 and return a sample to Earth in 2023. OSIRIS REx is being managed out of the University of Arizona in Tucson.

Rik and Dolores struck up a relationship through a common interest in astronomy and have been married for 35 years. Dolores's job at LPL is described as her dream come true. Rik came to the CSS via positions at Kitt Peak where operated the Burrell Schmidt telescope for the Warner & Swasey Observatory until 1992 when funding for that scope was terminated. He was then picked up at LPL to work with the Planetary Atmospheres and Planetary Occultation groups. When funding for that activity was terminated in 1999 he went immediately to work for the Catalina Sky Survey.

We will treat Rik and Dolores to dinner at the Outback Steak House before the meeting. If you would like to join us for dinner please RSVP to Ted Forte [tedforte511@gmail.com] and plan to be seated at 5PM.

Minor mergers have massive consequences for black holes

By Dr. Ethan Siegel

When you think of our sun, the nearest star to our world, you think of an isolated entity, with more than four light years separating it from its next nearest neighbor. But it wasn't always so: billions of years ago, when our sun was first created, it very likely formed in concert with thousands of other stars, when a giant molecular cloud containing perhaps a million times the mass of our solar system collapsed. While the vast majority of stars that the universe forms—some ninety-five percent—are the mass of our sun or smaller, a rare but significant fraction are ultra-massive, containing tens or even hundreds of times the mass our star contains. When these stars run out of fuel in their cores, they explode in a fantastic Type II supernova, where the star's core collapses. In the most massive cases, this forms a black hole.

Over time, many generations of stars—and hence, many black holes—form, with the majority eventually migrating towards the centers of their host galaxies and merging together. Our own galaxy, the Milky Way, houses a supermassive black hole that weighs in at about four million solar masses, while our big sister, Andromeda, has one nearly twenty times as massive. But even relatively isolated galaxies didn't simply form from the monolithic collapse of an isolated clump of matter, but by hierarchical mergers of smaller galaxies over tremendous timescales. If galaxies with large amounts of stars all have black holes at their centers, then we should be able to see some fraction of Milky Way-sized galaxies with not just one, but *multiple* supermassive black holes at their center!

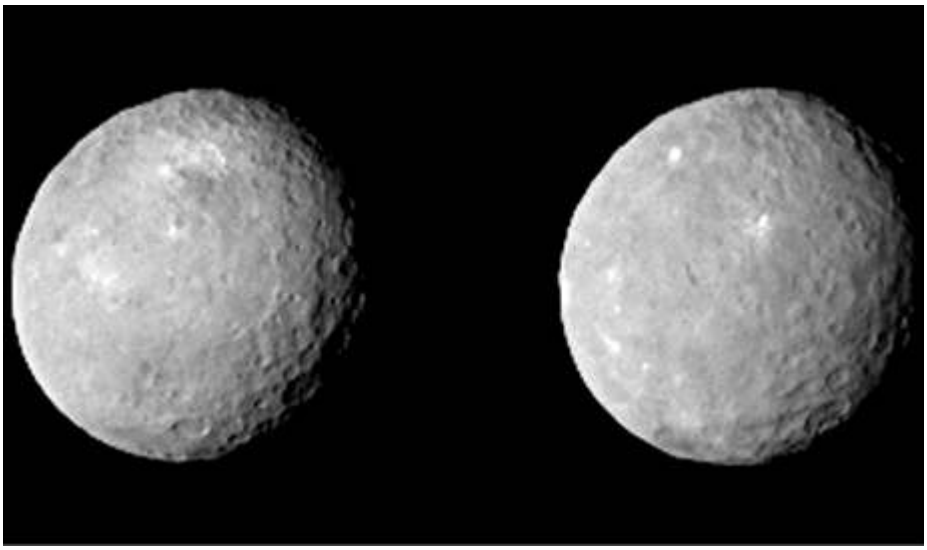
It was only in the early 2000s that NASA's Chandra X-ray Observatory was able to find the first binary supermassive black hole in a galaxy, and that was in an ultra-luminous galaxy with a double core. Many other examples were discovered since, but for a decade they were all in ultra-massive, active galaxies. That all changed in 2011, with the discovery of two active, massive black holes at the center of the regular spiral galaxy NGC 3393, a galaxy that must have undergone only minor mergers no less than a billion years ago, where the black hole pair is separated by only 490 light years! It's only in the cores of active, X-ray emitting galaxies that we can detect binary black holes like this. Examples like NGC 3393 and IC 4970 are not only confirming our picture of galaxy growth and formation, but are teaching us that supermassive relics from ancient, minor mergers might persist as standalone entities for longer than we ever thought!

Check out some cool images and artist reconstructions of black holes from Chandra:
http://chandra.harvard.edu/photo/category/blackholes.html

Kids can learn all about Black Holes from this cool animation at NASA's Space Place:
http://spaceplace.nasa.gov/black-holes.

Images credit: NGC 3393 in the optical (L) by M. Malkan (UCLA), HST, NASA (L); NGC 3393 in the X-ray and optical (R), composite by NASA / CXC / SAO / G. Fabbiano et al. (X-ray) and NASA/STScI (optical).

Editors download photo here: http://spaceplace.nasa.gov/review/partners/2015-01/ngc3393.jpg



Craters and mysterious bright spots are beginning to pop out in the latest images of Ceres from NASA's Dawn spacecraft. These images, taken Feb. 12 at a distance of 52,000 miles (83,000 kilometers) from the dwarf planet, pose intriguing questions for the science team to explore as the spacecraft nears its destination. - See more at: http://dawn.jpl.nasa.gov/feature_stories/Dawn_captures_sharper_images.asp#sthash.P2hMbFsl.dpuf

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Contact Rob Shernick at (520) 458-6790 or by email at nuvolari_p3@q.com

FOR SALE: Meade Starfinder 8" Reflector Telescope. Will Sell at a very reasonable price. Included are a Telrad Finder, Filters, and additional Lenses.
Please contact Mr. Jim Moses at (520) 803-0913 or at email <jjmoses2@gmail.com>

FOR SALE: Celestron Celestar 8 inch S/C Deluxe - $1200. Will also sell pieces individually
Contact Rhonda and Terry Taylor at (520) 366-2378 or by email at <twrl2@yahoo.com>
Or See Craigslist at at http://sierravista.craigslist.org/bar/4523742100.html

FOR SALE: Older Optical Guidance Systems 12.5" f/9 Ritchey-Chretian telescope. Very good Paul Jones ceramic optics, Robofocus secondary focuser, will include Takahashi collimating telescope. Some of the image through the scope are at Mshadephotography.com.
Contact Mike J. Shade at mshade@q.com

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HAC Calendar of Events for February- March 2015

SU	MO	TU	WE	TH	FR	SA
1 February Venus .08° S of Neptune	**2**	**3** 4:09 PM	**4**	**5** 6:30PM Cub Scouts at Patterson	**6** 7PM HAC Meeting Library Room 900 Jupiter at opposition	**7**
8	**9**	**10**	**11** 8:50 PM	**12**	**13**	**14**
15	**16** Mercury greatest elongation W (27°)	**17**	**18** 4: 23 PM	**19**	**20**	**21** Mars 1.5° S Moon, Venus 0.5° s of Mars Member Star party - GRUE
22	**23** Aldebaran 1° S of Moon 6:30PM Pie in Sky JCMS	**24**	**25** 10:14 AM 7:00PM Tourism Commission at Patterson	**26** 6:45 PM Public Night Patterson Obs.	**27**	**28**
1 March	**2**	**3** **Public Hearing P&Z Light and Sign Codes. 5PM**	**4**	**5** 11:05 AM Smallest Full moon of 2015	**6** 7PM HAC Meeting Patterson Obs. Rik & Dolores Hill	**7**
8 Daylight Savings Time Begins (Not Observed Here)	**9** Juno Stationary	**10**	**11** Mars 0.3° N of Uranus 7:00 PM Master Gardeners Patterson	**12**	**13** 10:48 AM	**14** Kartchner Star Party
15	**16**	**17** Mercury 1.6° S of Neptune **Public Hearing City Council - Signs**	**18**	**19**	**20** 2:36 AM Equinox 3:45 PM	**21** Member Star party - KEPPLE
22	**23**	**24**	**25** Aldebaran 0.9° S of moon. Cub Scouts Patterson	**26** 7:00PM Public Night Patterson Obs.	**27** 00:43 AM	**28**
29	**30**	**31**	Zodiacal Light may be visible in west after evening twilight March 8-21	Jupiter is retrograding in cancer and is well placed for observing	Saturn, in Scorpius rises near midnight this month	

All times MST. Join Haclist to keep up to date with all of the Huachuca Astronomy Club events
Send an email to: haclist-subscribe@yahoogroups.com