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**Docent Forum:** <http://groups.yahoo.com/group/docentforum/>

**Docent Calendar:** <http://groups.yahoo.com/group/docentforum/>

**Volunteering at Kitt**

**Peak:** <http://www.noao.edu/outreach/kpoutreach.html>

[www.noao.edu](http://www.noao.edu)



**KITT PEAK DOCENT**

## Next Docent Meeting Monday, November 19

The next docent meeting will be held on Monday, November 19. The meeting will convene at 6:00 in the main conference room and will feature dinner and a speaker. Docents should visit the docent forum calendar to schedule their hours. Docents who do not have web access may contact Nick Petrosino. See the URL for the docent calendar at lower left.

«First Name» «Last Name»  
«Mailing Address»  
«City» «State» «Zip Code»

Kitt Peak Docent Program

# DOCENT NEWS

Number 121

November 2007



**KITT PEAK DOCENT**

## CHILDREN'S AVIATION AND ASTRONOMY ART AT KITT PEAK

The theater area of the visitor center has some new decor. From October 29th to December 31st, the visitor center will host the Tucson Kids Art Show, a creation of roachworks.com. Roachworks, dedicated to promoting aviation and aerospace heritage through modeling and artwork, is the creative outlet of Fotios and Michelle Roach.

Fotios began creating aviation models as a child and nurtured his talent into adulthood. He now sets the standard for aviation modeling and artwork and is considered among the world's leading aviation modelers.

Michelle demonstrated artistic talent as a girl in school. She pursued an engineering degree in college but then rekindled her passion for art by drawing aircraft at the urging of her husband. Her first exhibit displayed thirty-nine pieces for the Centennial of Flight Art Show at the Tucson Airport in 2003.

The pieces displayed in the visitor center

represent the work of students and children at Sahuarita High School and YMCA Mulcahy. As stated on the flyers available in the visitor center, "The purpose of the art project is to motivate students in gaining knowledge of Tucson's history in Aviation, Aerospace, and Astronomy."

Kitt Peak is just one stop for this artistic road show. In August and September the pieces were on display at Pima Air and Space Museum. From Kitt Peak they go to the U of A Student Union until mid February and then to the Tucson-Pima Public Library until the end of March. The next stop is Juvenile Justice Hall through June and finally to Tucson International Airport until August.

The display showcases much young talent. Visitors who are interested in learning more about Roachworks or in buying prints or originals may visit [www.roachworks.com](http://www.roachworks.com).

### Points of Interest:

- The docent meeting is scheduled for Monday, November 19 and will feature dinner and a presentation.
- November 2: 90th anniversary (1917) of Mount Wilson 100-inch Telescope first light
- November 3: Taurids Meteor Shower peak
- November 8: Mercury at its greatest western elongation
- November 8: Asteroid 2005 GL near-Earth flyby at 0.020 AU
- November 13 to 14: American Astronomical Society National Conference: Celebrating 50 years, Houston, TX
- November 17: Moon occults Neptune
- November 17: Leonids Meteor Shower peak

For additional information about these points of interest, visit [www2.jpl.nasa.gov/calendar/](http://www2.jpl.nasa.gov/calendar/).

## NOVEMBER PROGRAMS

New Scope Night is scheduled for November 10. Vance Tanner will be conducting this program that instructs people new to the hobby of astronomy in the use of their telescopes and offer tips about observing. A comment heard often from visitors concerns the telescope that they bought or were given and do not know how to use. This is the perfect opening for a pitch about New Scope Night, and docents should take advantage of such an opportunity.

Family ASTRO Moon Mission is running downtown on Friday, November 16. A tendency is to think of programs in terms of Kitt Peak but remember that outreach offers programs downtown as well, a more convenient venue for events that do not require a dark night sky.

Moon Mission is followed by Junior Astronomer on Saturday, November 17. The pricing will soon change for this program. Adults will be free and the junior astronomers will be charged eight dollars instead of ten. The members' price will drop to five dollars. This program still has promise, but with the rising price of gasoline parents need a little more incentive to make the drive to Kitt Peak.

Docents are critical to our advertising efforts, so find a spot in your presentations to remind visitor about the special programs running on the mountain and downtown. When the infomercial is on the screen, point out that it offers information about all the programs available to visitors through their national observatory.

## MASSIVE BLACK HOLE SMASHES RECORD

Using two NASA satellites, astronomers have discovered a black hole that obliterates a record announced just two weeks ago. The new black hole, with a mass 24 to 33 times that of our Sun, is the heftiest known black hole that orbits another star.

The record-breaker belongs to the category of "stellar-mass" black holes. Formed in the death throes of massive stars, they are smaller than the monster black holes found in galactic cores. The previous record holder for largest stellar-mass black hole is a 16-solar-mass black hole in the galaxy M33, announced on October 17.

"We weren't expecting to find a stellar-mass black hole this massive," says Andrea Prestwich of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Mass., lead author of the discovery paper in the November 1 Astrophysical Journal Letters. "We now know that black holes that form from dying stars can be much larger than we had realized."

The black hole is located in the nearby dwarf galaxy IC 10, 1.8 million light-years from Earth in the constellation Cassiopeia. Prestwich's team could measure the black hole's mass because it has an orbiting companion: a hot, highly evolved star. The star is ejecting gas in the form of a wind. Some of this material spirals toward the black hole, heats up, and gives off powerful X-rays before crossing the point of no return.

In November 2006, Prestwich and her colleagues observed the dwarf galaxy with NASA's Chandra X-ray Observatory. The group discovered that the galaxy's brightest X-ray source, IC 10 X-1, exhibits sharp changes in X-ray brightness. Such behavior suggests a star periodically passing in front of a companion black hole and blocking the X-rays, creating an eclipse. In late November, NASA's Swift satellite confirmed the eclipses and revealed details about the star's orbit. The star in IC 10 X-1 appears to orbit in a plane that lies nearly edge-on to Earth's line of sight, so a simple application of Kepler's Laws show that the companion black hole has a mass of at least 24 Suns.

There are still some uncertainties in the black hole's mass estimate, but as Prestwich notes, "Future optical observations will provide a final check. Any refinements in the IC 10 X-1 measurement are likely to increase the black hole's mass rather than reduce it."

The black hole's large mass is surprising because massive stars generate powerful winds that blow off many Suns worth of gas before the stars explode. Calculations suggest massive stars in our galaxy leave behind black holes no heavier than about 15 Suns.

The IC 10 X-1 black hole has gained mass since its birth by gobbling up gas from its companion star, but the rate is so slow that the black hole would have gained no more than 1 or 2 solar masses. "This black hole was born fat; it didn't grow fat," says astrophysicist Richard Mushotzky of NASA Goddard Space Flight Center in Greenbelt, Md., who is not a member of

the discovery team.

The progenitor star probably started its life with 60 or more solar masses. Like its host galaxy, it was probably deficient in elements heavier than hydrogen and helium. In massive, luminous stars with a high fraction of heavy elements, the extra electrons of elements such as carbon and oxygen "feel" the outward pressure of light and are more susceptible to being swept away in stellar winds. But with its low fraction of heavy elements, the IC 10 X-1 progenitor shed comparatively little mass before it exploded, so it could leave behind a heavier black hole.

"Massive stars in our galaxy today are probably not producing very heavy stellar-mass black holes like this one," says coauthor Roy Kilgard of Wesleyan University in Middletown, Conn. "But there could be millions of heavy stellar-mass black holes lurking out there that were produced early in the Milky Way's history, before it had a chance to build up heavy elements."

Headquartered in Cambridge, Mass., the Harvard-Smithsonian Center for Astrophysics (CfA) is a joint collaboration between the Smithsonian Astrophysical Observatory and the Harvard College Observatory. CfA scientists, organized into six research divisions, study the origin, evolution and ultimate fate of the universe.

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# November 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 Gerald, Joe	2 Everett, Dave	3 Ken, Gerald
4 Larry L.	5 Everett	6 Joyce	7 Sheila	8 Joe Desert Sky MS 65	9 Gerald	10 Eugene, Vance
11 Jerry, Gerald	12 Aubrey, Everett	13 Joyce, Larry E. Tour grp. 45	14 Sheila	15 Jerry	16 Gerald, Ken, Vance (C)	17 Eugene, Jerry
18 Ken	19 Need Docent Docent Meeting	20 Jerry, Larry E.	21 Sheila	22 Need Docent	23 Gerald, Vance (C)	24 Jim, Jerry
25 Gerald	26 Aubrey	27 Jerry, Joyce	28 Eugene (C), Sheila	29 Jerry, Joe Proj. Exp. 90	30 Gerald, Vance (C) Proj. Exp. 90	

## KIDS' DAY AT KITT PEAK: THE EVENT THAT WASN'T

The sky was clear and the weather was warm. The docents were at their stations by 10:00, and signs had been posted about the grounds to direct the public to the various locations being used for Kids' Day at Kitt Peak. The Coronado telescopes were tracking the sun. The visitor center staff were ready to hand out tickets and information sheets to the parents of the kids. The grill was tucked into the refreshment shed on the patio, ready to cook hot dogs and hamburgers for the hungry crowd. The crowd was all that was missing.

And so it would remain for the rest of the day. The inaugural Kids' Day program failed to attract even one family. The decision was made to shut down at 1:30. There was, though, an upside to this program misfire. There are now materials and handouts available in the roll-off-roof facility for use with school groups or other groups involving children, such as the

Project Exploration groups scheduled for later this month. The docents also made use of the time to review and prepare some of the activities so less effort will be required next time the event is offered., probably early spring.

After further review, it was decided that the next event will not include lunch and the price will be lower. Changes might also be made to the tours to make them less typical of the regular daytime tours.

Many thanks go to Joyce Park for her numerous suggestions, time, and effort in developing activities for the event. Thanks to Vance Tanner, Laura Woods, and Paul Barby for contributing their time and remaining on station all day, prepared to engage children had any shown up. It is because of the docents that the department can consider developing programs such as Kids' Day at Kitt Peak.