

## Contact List

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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)



## Next Docent Meeting Monday, February 20

The next docent meeting will be held on Monday, February 20. 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 for February. 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»

# DOCENT NEWS



## NEW VISITOR CENTER OBSERVATORY BEING REFURBISHED

Just up the hill to the west of the visitor center is a group of observatories, including a flat roof structure that most docents know as an MIT/NASA facility housing an instrument called the Explosive Transient Camera/Rapidly Moving Telescope, or ETC/RMT for short. Ownership of that building recently changed to the visitor center and will soon house a 16-inch telescope from RC Optical in Flagstaff.

Currently the facility is being given a makeover to make it usable for the evening observing program. The telescope is on its way down from Flagstaff and should be installed by March. Meanwhile the maintenance staff have been patching and painting the interior, the building having been long neglected by the former tenants.

In addition to allowing expansion the NOP

and AOP, the building offers the visitor center much needed classroom and office space. Furniture and projection equipment has been ordered for the classroom, which will accommodate at least 20 people. It is larger than the classroom behind the kitchen and has a restroom attached. Special programs such as New Scope Night will now have a comfortable place to convene. A room under the pier will be provide a workspace for the nighttime staff and the office will easily accommodate desks, cabinets, and storage shelves.

The front of the building has a patio large enough for a number of benches; guests for the NOP will soon have a scenic spot to sit and enjoy their meals as they watch the Sun sink below the horizon, signaling the start of one of our ever expanding public programs.

## FIRE SEASON 2006

With an almost non-existent winter so far, the threat of fire on Kitt Peak, always a concern, will be all the greater this year. We have not had the usual winter rains and temperatures are on the rise early. A draught is likely so there will be plenty of dry foliage surrounding the facility. To reduce the chance of a fire, docents must remember to include the smoking warning in their safety brief to visitors before embarking on tours.

The official stance on smoking is that it is allowed but with restrictions. Visitors must be asked to refrain from smoking while on the observatory grounds. For those who cannot spend a few hours enjoying the serenity of Kitt Peak without lighting up, they must smoke inside their vehicles and extinguish all smoking materials prior to leaving their vehicles. Smokers arriving by motorcycle may just have to grit their teeth or cut their visits

short. Because some staff and visiting astronomers smoke, it is difficult to prohibit smoking, however sensible that may seem. It is equally difficult to allow smoking for staff and prohibit it for visitors. So the compromise is to restrict it and remain vigilant for infractions of the smoking policy.

Docents who encounter visitors smoking while on the grounds should make them aware of the policy tactfully. People who bother to drive to Kitt Peak will likely appreciate the need to protect it. Should a docent encounter resistance from a visitor, the docent may report the incident to the visitor center.

It takes just a moment to remind people not to smoke and doing so may prevent a genuine disaster. From our mountain top, help is a long way off.

### Points of Interest:

- The docent meeting is scheduled for Monday, February 20, featuring dinner and a speaker.
- February 4: Clyde Tombaugh's 100th birthday.
- February 5: Asteroid 2006 BM55 near-Earth flyby at 0.021 AU.
- February 9: Asteroid 2006 BX39 near-Earth flyby at 0.021 AU.
- February 20: 20th anniversary of Mir Space Station launch.
- February 22 to 26: 4th Annual Deep South Texas Stargaze near Freer, Texas.
- February 23 to 24: Mars Water Workshop, Moffett Field, California.
- February 27: Cassini, Titan flyby.

For additional information about these points of interest, visit <http://www2.jpl.nasa.gov/calendar/>.

## TWO EXILED STARS ARE LEAVING OUR GALAXY FOREVER

Cambridge, MA - TV reality show contestants aren't the only ones under threat of exile. Astronomers using the MMT Observatory in Arizona have discovered two stars exiled from the Milky Way galaxy. Those stars are racing out of the Galaxy at speeds of more than 1 million miles per hour - so fast that they will never return.

"These stars literally are castaways," said Smithsonian astronomer Warren Brown (Harvard-Smithsonian Center for Astrophysics). "They have been thrown out of their home galaxy and set adrift in an ocean of intergalactic space."

Brown and his colleagues spotted the first stellar exile in 2005. European groups identified two more, one of which may have originated in a neighboring galaxy known as the Large Magellanic Cloud. The latest discovery brings the total number of known exiles to five. "These stars form a new class of astronomical objects - exiled stars leaving the Galaxy," said Brown.

Astronomers suspect that about 1,000 exile stars exist within the Galaxy. By comparison, the Milky Way contains about 100,000,000,000 (100 billion) stars, making the search for exiles much more difficult than finding the proverbial "needle in a haystack." The Smithsonian team improved their odds by preselecting stars with locations and characteristics typical of known exiles. They sifted through dozens of candidates spread over an area of sky almost 8000 times larger than the full moon to spot their quarry.

"Discovering these two new exiled stars was neither lucky nor random," said astronomer Margaret Geller (Smithsonian Astrophysical Observatory), a co-author on the paper. "We made a targeted search for them. By understanding their origin, we knew where to find them."

Theory predicts that the exiled stars were thrown from the galactic center millions of years ago. Each star once was part of a binary star system. When a binary swings too close to the black hole at the Galaxy's center, the intense gravity can yank the binary apart, capturing one star while violently flinging the other outward at tremendous speed (hence their technical designation of hypervelocity stars).

The two recently discovered exiles both are short-lived stars about four times more massive than the sun. Many similar stars exist within the galactic center, supporting the theory of how exiles are created. Moreover, detailed studies of the Milky Way's center previously found stars orbiting the black hole on very elongated, elliptical orbits - the sort of orbits that would be expected for former companions of hypervelocity stars.

"Computer models show that hypervelocity stars are naturally made near the galactic center," said theorist Avi Loeb of the Harvard-Smithsonian Center for Astrophysics. "We know that binaries exist. We know the galactic center holds a super-massive black hole. So, exiled stars inevitably will be produced when binaries pass too close to the black hole."

Astronomers estimate that a star is thrown from the galactic

center every 100,000 years on average. Chances of seeing one at the moment of ejection are slim. Therefore, the hunt must continue to find more examples of stellar exiles in order to understand the extreme environment of the galactic center and how those extremes lead to the formation of hypervelocity stars.

The characteristics of exiled stars give clues to their origin. For example, if a large cluster of stars spiraled into the Milky Way's central black hole, many stars might be thrown out at nearly the same time. Every known hypervelocity star left the galactic center at a different time, therefore there is no evidence for a "burst" of exiles.

Hypervelocity stars also offer a unique probe of galactic structure. "During their lifetime, these stars travel across most of the Galaxy," said Geller. "If we could measure their motions across the sky, we could learn about the shape of the Milky Way and about the way the mysterious dark matter is distributed."

The first newfound exile, in the direction of the constellation Ursa Major, is designated SDSS J091301.0+305120. It is traveling out of the galaxy at a speed of about 1.25 million miles per hour and currently is located at a distance of about 240,000 light-years from the earth. The second exile, in the direction of the constellation Cancer, is designated SDSS J091759.5 +672 238. It is moving outward at 1.43 million miles per hour and currently is located about 180,000 light-years from the earth.

Both stars, although traveling at tremendous speeds through space, are located so far from the earth that their motion cannot be detected except with sophisticated astronomical instruments.

This research has been submitted to The Astrophysical Journal Letters for publication and will be available online at <http://arxiv.org/abs/astro-ph/0601580> Authors on the paper are Brown, Geller, Scott Kenyon and Michael Kurtz (Smithsonian Astrophysical Observatory).

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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# February 2006

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 Punch, Sheila	2 Jerry, Richard G.	3 Don, Doug	4 Ken, Jim O.
5 Eugene, Anna	6 Jerry, Bill	7 Joyce, Bob Mc.	8 Punch, Sheila	9 Jerry, Barbara	10 Don, Richard G.	11 Ken, Larry L.
12 Jerry, Ken	13 Bill, Jim S.	14 Joyce, Barbara, Bob Mc.	15 Punch, Sheila Pima CC	16 Jerry	17 Don, Doug	18 Eugene, Jim O.
19 Jerry, Larry L.	20 Bill, Jim S. Docent Meeting	21 Joyce, Richard G., Bob Mc.	22 Punch, Sheila	23 Jerry, Barbara	24 Don, Doug, Richard G.	25 Jerry, Jim O.
26 Eugene, Anna	27 Jerry Free Spirit Tours 45	28 Bill, Larry E.				

## NEW DOCENT TRAINING CLASS IS UNDERWAY

Eleven enthusiastic individuals are in their second week of docent training in the winter session. The combination of T.V. and print ads garnered a substantial response and this class holds much promise.

As usual the trainees have varied backgrounds and all bring to the class valuable experience and considerable knowledge, some of it quite technical. Ideally some of that knowledge will work its way into the docent program in the form of ideas for demonstrations, exhibits, and as expertise in turning those ideas into tangible objects.

The curiosity of the trainees and the insightful questions they ask make conducting the class every enjoyable. That same curiosity and enthusiasm will served them well when dealing with the public, as it serves the current docents, who continually strive to improve their knowledge and refine their presentations. These trainees should feel at home among the

other docents on Kitt Peak.

To aid them in getting established on the mountain, mentors will be needed. In addition to those who served as mentors for the last class, the department will need other volunteers to accommodate the large class size. Docents interested in mentoring should contact the docent coordinator. The mentor phase of training lasts thirty days from the graduation date, which is March 15th.

The trainees are Aubrey Mendelow, John Ward, Gerald Geise, Vance Tanner, Michael Callahan, Harry Fowler, Kelly Galvin, Jerry Luce, Jon Payne, Frank Andrews, and David Smith. Some of them are making regular visits already to Kitt Peak to get a feel for the facility and our guests. Should a docent meet a trainee while on duty, please make every effort to welcome him and help him become familiar with the observatory..