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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



Next Docent Meeting Monday, March 17

The next docent meeting will be held on Monday, March 17. 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»

DOCENT NEWS



NEW PARKING ARRANGEMENT FOR TRAINEES

Parking has long been an issue at NOAO. To compound the problem, students freely make use of NOAO parking, ticketing and towing notwithstanding. Even though parking has not been abundant, staff and volunteers are usually able to find spaces.

To better monitor parking, NOAO assumed complete control of the parking lot at 1st and Martin, which allowed Central Facilities to install access control devices. Doing so should prevent unauthorized parking. Yet parking spaces will not increase.

For the last fifteen years, NOAO staff and volunteers have made do with 184 spaces in three lots, according to John Dunlop of CFO. Between the recent re-striping of two of those lots and an exchange with the university to gain control of the large parking lot, NOAO lost twenty-four spaces but will revise the layout to reclaim all but eight of them, Dunlop wrote in a recent email.

Unfortunately the new parking arrangement carries consequences for the docent trainees. They will have to use the 2nd Street parking garage located at the corner of Mountain and 2nd. While this may be less convenient than the NOAO lot, the good news is that trainees will not have to pay for

the parking. Eleven spaces have been reserved for next Wednesday, and the fees will be charged to an NOAO purchase order.

The spaces have been reserved under Docent Training. At the entrance to the parking structure, take the ticket from the machine and hang on to it. If the entrance displays a sign saying "lot full" use the intercom to call the cashier's office and tell the attendant you are with Docent Training. If you gain access to the parking structure in that manner, a ticket will not be issued at the gate.

When leaving stop first at the cashier's station on the ground floor and present the ticket. If you did not get a ticket at the gate, one will be issued by the cashier. Either way, the ticket will be validated, and you may drive out. This will be the procedure for the remainder of training.

Public Outreach apologizes for the inconvenience. The parking garage is not too much farther from the lobby than the parking lot, but please allow a little extra time on Wednesday, March 5th to ensure that the class begins on time. The area near the entrance of the garage can get congested. Please bring your parking passes to class. They must be returned to CFO.

DOCENT EVALUATIONS TO BEGIN IN MARCH

There are some docents with whom staff rarely make contact because of their schedules. In an effort to reestablish contact with those docents and to demonstrate to all docents that their function at NOAO is taken seriously, staff will be attending tours and evaluating the guides.

The evaluations will cover all the aspects of guiding tours and other responsibilities for which docents have been trained. Docents and staff will have the opportunity to discuss the evaluation, and should there be any ad-

justments needed, such as updating information, they can be identified and agreed upon at that time.

The evaluations are about keeping interpersonal communication flowing between staff and volunteers. The docents generally do a commendable job of informing the public about Kitt Peak and so provide a much appreciated service to the observatory. The evaluations present a chance for staff to express that appreciation and help the docents maintain their high level of professionalism.

Points of Interest:

- The docent meeting is scheduled for Monday, March 17 and will feature dinner and speaker Dr. Alexandra Pope.
- March 1: Sally Ride Science Festival, Tempe, Arizona
- March 3: Mercury at its greatest western elongation of 27 degrees
- March 5: Moon occults Mercury
- March 5: Moon occults Venus
- March 18: Asteroid 2322 Kitt Peak closest approach to Earth at 1.380 AU
- March 20: Vernal Equinox, 05:48 UT
- March 21: Asteroid 2003 FY6 near-Earth flyby at 0.016 AU

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

NEW THEORY OF STAR FORMATION

In order for a rare, massive star to form inside an interstellar cloud of gas and dust, small "helper" stars about the size of the sun must first set the stage, according to a new theory proposed by astrophysicists at the University of California, Berkeley, and Princeton University.

Massive stars between 10 and 150 times the mass of the sun are few in number but produce the bulk of the heavy elements in a galaxy when they explode in supernovas. Their extreme brightness makes them signposts of star formation in distant galaxies.

Astrophysicist Christopher F. McKee, professor of physics and astronomy at UC Berkeley, and Mark R. Krumholz, a Hubble postdoctoral fellow in the Department of Astrophysical Sciences at Princeton, have been modeling the formation of these stars for nearly 10 years. Recently, they looked at the conditions inside cold clouds of molecular hydrogen that favor formation of massive stars over low-mass stars like the sun.

In a report this week in Nature, Krumholz and McKee argue that early formation of a few low-mass stars in a cloud paves the way for later formation of a stellar big brother instead of fragmentation of the cloud into a hundred smaller clouds, which would produce only low-mass siblings.

"It's only the formation of these low-mass stars that heats up the cloud enough to cut off the fragmentation," McKee said. "It is as if the cold molecular cloud starts on the process of making low-mass stars but then, because of heating, that fragmentation is stopped and the rest of the gas goes into one large star."

"What it comes down to is that if a cloud is cold, it tends to break up into many small pieces that become low-mass stars," added Krumholz, who recently accepted a faculty position with the astronomy department at UC Santa Cruz. "As the cloud gets warmer, though, it can make bigger and bigger objects."

The cloud temperatures are still cold, however. A typical interstellar hydrogen cloud is 10-20 degrees Celsius above absolute zero (10-20 Kelvin, or about -430 degrees Fahrenheit), while low-mass stars can heat the cloud to double or triple this temperature. To stop the entire cloud from collapsing, the temperature would have to increase to many hundreds of degrees above absolute zero, McKee said.

According to Krumholz, each small star within a hydrogen cloud has a zone of influence where it warms up the gas and prevents it from collapsing into small fragments. In low density clouds, each zone of influence is small and contains very little mass, so this effect is unimportant.

As the density increases, however, the gas and small stars get packed closer and closer together. Eventually, said Krumholz, the zones of influence of the few low-mass stars encompass the entire cloud, preventing the cloud from fragmenting and forcing it to collapse to make a massive star.

McKee noted that this collapse occurs within an even larger interstellar cloud that may contain more than a million times

the mass of the sun. Therefore, as in our galaxy's Orion Nebula, many massive stars may be forming simultaneously inside a giant molecular cloud.

The density above which massive stars can form is about a million hydrogen molecules per cubic centimeter, which is a very extreme vacuum on Earth, he said, but nevertheless dense enough to collapse into a massive star over hundreds of thousands of years. The particle density in Earth's atmosphere is 10 trillion times greater.

According to McKee, one implication of the density limitation is that in the outer reaches of galaxies, where the density may not reach this threshold in a sufficiently large region of space, low-mass stars may be forming in the absence of any massive stars. Because we can see only the big, bright stars from Earth, he said, astronomers may be underestimating the amount of star formation going on in distant galaxies.

"In fact, there may be many stars forming in the outer reaches of distant galaxies, just not the bright ones we can see," McKee said. "Star formation could be occurring that is essentially invisible."

He noted that a recent satellite collecting ultraviolet light from distant galaxies has seen evidence of star formation in the very outer regions of galaxies, and that this may confirm their prediction.

McKee and Krumholz are involved in large-scale computer simulations of star formation inside cold molecular clouds to confirm the researchers' mathematical theory that low-mass star formation is necessary for formation of high-mass stars.

The work was supported by the National Science Foundation and NASA's Hubble Fellowship program.

For a 29 MB movie (mpeg) simulation of the collapse of a 100 solar mass protostellar core to a massive star, visit:

<http://www.astro.princeton.edu/~krumholz/movies/krumholz07a.mpg>.

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March 2008

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1 Jim, Jerry, Paul, Mike <i>sch groups 70</i>
2 Larry L., Gerald, Mike	3 Aubrey, Joe W.	4 Jerry, Gerald	5 Sheila, Everett	6 Robert, Joe S.	7 Vance (C), Jerry	8 Eugene, Jim <i>Hurtz. Tours 40</i>
9 Jerry, Ken	10 Robert, Joe W. <i>Prescott H.S. 40</i>	11 Joyce, Jerry	12 Sheila, Jack	13 Joe S., John C.	14 Joe W., Everett, Mike	15 Jerry, Jim
16 Ken, Eugene	17 Joyce, Frank <i>Docent Meeting</i>	18 Jerry, Gerald <i>Cat. F'thills 30</i>	19 Sheila, Robert	20 Joe S., Jerry <i>S. Academy 40</i>	21 Jack, John C., Mike	22 Larry L., Jim
23 Gerald, Ken	24 Robert, Joe W.	25 Joyce, Gerald	26 Sheila	27 Joe S., Mike	28 Jerry, Don	29 Mike
30 Jerry, Ken	31 Jack					

PUBLIC OUTREACH TO ATTEND TUCSON SYMPHONY

The Tucson Symphony Orchestra is performing *The Planets*, by Elgar Holst, on March 6, 7, and 9, and the Public Outreach Department has been invited to set up a booth at the music hall along with Flandrau Science Center and Tucson Amateur Astronomy Association. The invitation was issued by TSO's marketing staff.

NOAO's booth will feature the usual assortment of brochures plus a special flyer promoting the Stars and Music series. Planet activities will also be on hand such as the planet bottles, the moon phase demonstrator, and the seasons demonstration.

The booth will be set up by 5:30 PM on Thursday, March 6 and left in place inside the music hall until 4:00 PM on Sunday, March 9. The performances are scheduled for 8:00, 8:00,

and 2:00 respectively, and staff and docents will be on site an hour earlier to staff the booth as guests arrive. Additionally a twenty-minute intermission is planned, during which the booth will also be staffed.

Three docents have volunteered for booth duty. Joe Wilkins will be working with Rich Fedele on the 6th. Jack Juraco has volunteered to work the 7th with Robert Wilson, and Robert Irwin will be on duty the afternoon of the 9th, also with Robert Wilson. Those docents are welcome to attend the concert on those evenings if they have tickets.

Anyone else attending the concert may feel free to stop by the booth to visit. TAAA will have telescopes set up outside for the viewing pleasure of the concert goers. Saturn will likely be the object du jour, appropriately enough.