

Contact List

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Kitt Peak Docent Program

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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, May 21

The next docent meeting will be held on Monday, May 21. 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 115

May 2007



DOCENTS AND OUTREACH PROGRAMS

Points of Interest:

- The docent meeting is scheduled for Monday, May 21 and features dinner and a speaker.
- May 4: Space Day
- May 5: Eta Aquarids Meteor Shower peak
- May 5: Phoenix Mars Mission Open House, Tucson
- May 13 to 20: Texas Star Party, near Fort Davis, TX
- May 19: 1st International Sidewalk Astronomy Night
- May 22: Asteroid 2003 YN107 near-Earth flyby at 0.062 AU
- May 25 to 28: 39th Annual Riverside Telescope Makers Conference, near Big Bear City, CA
- May 31: Asteroid 4 Vesta at opposition, 5.4 magnitude

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

Docents who are interested in learning more about and participating in public outreach programs will have plenty to experience in May. Docent involvement in programs is as important as involvement with the visitor center. Granted many of the programs are conducted downtown for convenience, but they still constitute interaction with the public and support for astronomy.

Family Astro is becoming popular and presents an excellent opportunity to educate the public about a variety of night sky wonders. Family Astro consists of four events, one being held each month: Night Sky Adventure - May 4th, Moon Mission, Race to The Planets, and Cosmic Decoders. Educational Outreach also conducts event-leader training for Family Astro in the fall, but docents do not have to wait that long to learn about this fun-filled program.

Anyone who owns a telescope and is interested in attending a star party, Stars and Music is scheduled for May 19th. The featured entertainment is Tucson Junior Strings Quartet. When the music stops and the stars come out, guests are invited to view celestial wonders through amateur telescope in the picnic area. The more telescopes the better.

On May 25th guests can explore the Moon in Lunar Adventure. This program introduces the public to our only natural satellite in all its cratered glory. Hands-on activities explain the lunar phases and the Earth-Moon sizes and distance. The program concludes with some lunar observing with the Meade 8-inch telescope in the parking lot.

Any docent interested in having fun with guests of all ages and helping them experience astronomy may contact the docent coordinator for more details.

SCHOOL GROUPS IN MAY

May is the turning out to be the month of the school visits. If the estimates are correct, Kitt Peak should host three hundred seventy-seven students and chaperones between May 4th and May 23rd. This is a significant increase over previous years: May 2006 saw school groups totaling one hundred thirteen and May 2005 saw a few more with 185.

Thanks to the efforts of Joyce Park, outreach has a detailed logistical plan for handling large groups such as the one hundred fifty-five from Deer Valley Middle School this Friday. If the plan is followed closely, all the students should get through all three telescopes, the visitor center, lunch, and the MCNP in time to depart at 2:00.

With a large-group plan in place, other school groups in May and beyond should be

easy to accommodate. Douglas Unified School District will bring one hundred sixty people eighty at a time on May 14th and 16th. Then Spectrum Elementary one week later on May 23 will arrive with another group of one hundred sixty. There will always be variables, but a good plan makes solving for them much easier.

Public Outreach hopes this upswing in school field trips continues. In fact the department is making a concerted effort to entice schools to schedule trips. A school packet is being developed that will offer students and teachers from grades K to 12 activities linked to Arizona State Standards and the justification they need to schedule a field trip to Kitt Peak.

ASTRONOMERS FIND FIRST HABITABLE EARTH-LIKE PLANET

Astronomers have discovered the most Earth-like planet outside our Solar System to date, an exoplanet with a radius only 50% larger than the Earth and possibly having liquid water on its surface. Using the ESO 3.6-m telescope, a team of Swiss, French and Portuguese scientists discovered a super-Earth about 5 times the mass of the Earth that orbits a red dwarf, already known to harbor a Neptune-mass planet. The astronomers have also strong evidence for the presence of a third planet with a mass about 8 Earth masses.

This exoplanet - as astronomers call planets around a star other than the Sun - is the smallest ever found up to now and it completes a full orbit in 13 days. It is 14 times closer to its star than the Earth is from the Sun. However, given that its host star, the red dwarf Gliese 581, is smaller and colder than the Sun - and thus less luminous - the planet nevertheless lies in the habitable zone, the region around a star where water could be liquid!

"We have estimated that the mean temperature of this super-Earth lies between 0 and 40 degrees Celsius, and water would thus be liquid," explains Stéphane Udry, from the Geneva Observatory (Switzerland) and lead-author of the paper reporting the result. "Moreover, its radius should be only 1.5 times the Earth's radius, and models predict that the planet should be either rocky - like our Earth - or covered with oceans," he adds.

"Liquid water is critical to life as we know it," avows Xavier Delfosse, a member of the team from Grenoble University (France). "Because of its temperature and relative proximity, this planet will most probably be a very important target of the future space missions dedicated to the search for extra-terrestrial life. On the treasure map of the Universe, one would be tempted to mark this planet with an X."

The host star, Gliese 581, is among the 100 closest stars to us, located only 20.5 light-years away in the constellation Libra ("the Scales"). It has a mass of only one third the mass of the Sun. Such red dwarfs are at least 50 times intrinsically fainter than the Sun and are the most common stars in our Galaxy: among the 100 closest stars to the Sun, 80 belong to this class.

"Red dwarfs are ideal targets for the search for such planets because they emit less light, and the habitable zone is thus much closer to them than it is around the Sun," emphasizes Xavier Bonfils, a co-worker from Lisbon University. Any planets that lie in this zone are more easily detected with the radial-velocity method, the most successful in detecting exoplanets.

Two years ago, the same team of astronomers already found a planet around Gliese 581 (see ESO 30/05). With a mass of 15 Earth-masses, i.e. similar to that of Neptune, it orbits its host star in 5.4 days. At the time, the astronomers had already seen hints of another planet. They therefore obtained a new set of measurements and found the new super-Earth, but also clear

indications for another one, an 8 Earth-mass planet completing an orbit in 84 days. The planetary system surrounding Gliese 581 contains thus no fewer than 3 planets of 15 Earth masses or less, and as such is a quite remarkable system.

The discovery was made thanks to HARPS (High Accuracy Radial Velocity for Planetary Searcher), perhaps the most precise spectrograph in the world. Located on the ESO 3.6-m telescope at La Silla, Chile, HARPS is able to measure velocities with a precision better than one meter per second (or 3.6 km/h)! HARPS is one of the most successful instruments for detecting exoplanets and holds already several recent records, including the discovery of another 'Trio of Neptunes' (ESO 18/06, see also ESO 22/04).

The detected velocity variations are between 2 and 3 meters per second, corresponding to about 9 km/h! That's the speed of a person walking briskly. Such tiny signals could not have been distinguished from 'simple noise' by most of today's available spectrographs.

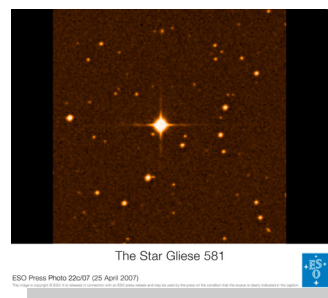
"HARPS is a unique planet hunting machine," says Michel Mayor, from Geneva Observatory, and HARPS Principal Investigator. "Given the incredible precision of HARPS, we have focused our effort on low-mass planets. And we can say without doubt that HARPS has been very successful: out of the 13 known planets with a mass below 20 Earth masses, 11 were discovered with HARPS!"

HARPS is also very efficient in finding planetary systems, where tiny signals have to be uncovered. The two systems known to have three low mass planets - HD 69830 and Gl 581 - were discovered by HARPS.

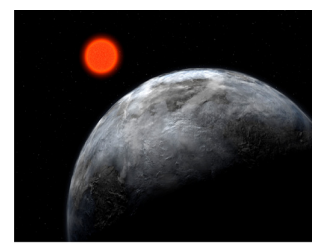
"And we are confident that, given the results obtained so far, Earth-mass planets around red dwarfs are within reach," affirms Mayor.

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The Star Gliese 581



A Super-Earth around Gliese 581 (Artist's Impression)

May 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1 Barbara, Jon	2 Sheila	3 John C.	4 Vance (C), Doug Mt. View MS 57	5 Jim O.
6 Larry L.	7 Jon	8 Joyce	9 Sheila	10 Need Docent	11 Vance (C), Doug	12 Jim O.
13 Need Docent	14 Joyce, Laura, Aubrey Douglas Sch. 80	15 Joyce, Jon	16 Sheila, Richard Douglas Sch. 80	17 Need Docent	18 Need Docent	19 Jim O., Eugene
20 Need Docent	21 Joyce, Ken Docent Meeting	22 Jon	23 Sheila, Aubrey, Richard, Ken Spect. Elem 160	24 Ken	25 Need Docent	26 Larry L.
27 Ken	28 Need Docent	29 Joyce	30 Sheila, Eugene	31 Need Docent		

MIRROR DISPLAY UPGRADE

It had been quite a while since the plans for an upgrade to the mirror display in the visitor center were formulated, but those plans are finally in the works. With the generous assistance of Barclay Ward, quotations for the fabrication of display elements were obtained from a couple of vendors in Tucson and a purchase requisition sent to procurement.

That requisition should result in a purchase order to Plastics Plus for the honeycomb mirror segment and its display case. An actual core from the mirror lab at Steward Observatory will be used in the display. The estimated time for completing the segment and display case is three to five weeks after receipt of the purchase order.

Ward, on the other hand, is fabricating the base on which the display case and mirror segment will stand. He is also fabricating the metal supports that will hold the replica of the

WIYN mirror above the honeycomb display, the supports for two other mirror-design replicas, a segmented type and the LSST mirror, and a light box that will contain graphics and interpretive text to explain the development of large mirrors and their importance to astronomical research.

A completion date will not be projected until the visitor center takes delivery of the honeycomb segment and case and Ward has the base nearly completed. At that point realistic estimates of production time for the remaining elements should be possible.

The upgraded mirror display will be well worth the wait. It will highlight mirror-making technology and point to the future of astronomy and NOAO. The latter especially will complement nicely the largely historical focus of our current displays and presentations.