



INSIDE THIS ISSUE:

President's Message	1
Club Meetings	1
Dedication	2
Mistakes	3
Mistakes Cont.	4
Shuttle	4

THE MORRIS MUSEUM ASTRONOMICAL SOCIETY

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The *Heavenly Herald* is produced quarterly for the membership of the Morris Museum Astronomical

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PRESIDENT'S MESSAGE

Ron Russo, President

Hello again MMAS members. I hope you had a good summer. The club participated in some wonderful nights a Jenny Jump. This last 3 month of 2009 will be exciting for all who are interested in astronomy. Please mark your calendars for the upcoming events:

The UACNJ & AAAP are presenting The 2009 STARQUEST & ASTRONOMY SYMPOSIUM on October 16 17 & 18.

Featuring

- Stargazing at a star-filled, dark sky location.
- Dozens of Astronomical tele-

- scopes available for use.
 - "Deep Sky Observing" contest
 - Free space available for astronomical swap meet.
 - Heated cabin accommodations (most with private bath; first come, first served)
 - Ample space for camping & RV's, hot showers for all
- Saturday includes full meals, a spectacular raffle & door prizes.

All events except nighttime observation and solar observation are held rain or shine.

For more information please see the attached flier.

CLUB MEETINGS

Sept. 10 - TBA
Oct. 8 - Update on the Orbiting Solar Observatory - By Ron Schmaki
Nov. 12 - Super Nova - By Joe Molnar

Monthly Meetings are the second Thursday of each month at 7:30 p.m.
 During July & August check the web site for specific information.

Mammoth Telescope to Be Built in Hawaii

Hawaii beat out Chile to become the site of the Thirty-Meter Telescope, which is scheduled to be completed in 2018. The giant telescope will have a single primary mirror that measures 30 meters across and is made up of 492 segments, giving it nine times more collecting surface than the [the biggest telescopes on Earth](#) today.

The [Thirty-Meter Telescope](#) will sur-

pass even the [Hubble Space Telescope](#) in some ways, giving scientists a new view of some of the oldest stars and galaxies in the universe, as well as planets orbiting nearby stars. Mauna Kea in Hawaii, the site of the [Keck](#) and [Subaru](#) telescopes, was among five candidate sites selected based on a global satellite assessment of atmosphere and climate variables. After further studies, Hawaii and Cerro Amazonas in Chile rose to the top of the list.

“In the final analysis, the board selected Mauna Kea as the site for TMT,” Edward Stone, Caltech physicist and vice chairman of the TMT board, said in a press release Tuesday. “The atmospheric conditions, low average temperatures, and very low humidity will open an exciting new discovery space using adaptive optics and infrared observations.”

The project still needs to be approved by the the state and \$100 million still needs to be raised for construction. The rest of the \$300 million estimated cost will come from the Gordon and Betty Moore Foundation. The telescope project is the joint venture of Caltech, the University of California and a group of Canadian Universities called ACURA.

“We are excited about the prospect of being the first of the next generation of extremely large telescopes,” said Professor Ray Carlberg, the Canadian Large Optical Telescope project director and a TMT board member.

Other giant telescope projects include the [Giant Magellan Telescope](#) meters and the 42-meter [European Extremely Large Telescope](#).



Telescopes to show universe soon after Big Bang

"Look deep into nature, and then you will understand everything better" -- Albert Einstein

This galaxy, as seen by Hubble, is 50 million light years away. The new telescopes promise even sharper images.

1 of 3 (CNN) -- It may not be possible to travel back in time, but seeing stars and galaxies as they looked millions or even billions of years ago is no problem thanks to telescopes, the closest thing we have to time machines.

Now, astronomers are holding their breath to see what they'll observe and discover with a new generation of huge telescopes set to be built around the world.

Peering ever deeper into space and further back in time, the powerful devices will be able to show what the universe was like when it was just a few hundred million years old and emerging from a period of total darkness after the Big Bang.

"[We'll be] looking at the first generation of stars forming in the universe, which is kind of a cool idea: The time when the lights went on in the universe. There was no light before that time," said Daniel Fabricant, associate director of the Harvard-Smithsonian Center for Astrophysics.

His institution is one of several research organizations and universities developing the Giant Magellan Telescope, to be built in Las Campanas, Chile, by 2018.

'Eye on the sky'

Bigger is better in the world of reflecting telescopes, which rely on primary mirrors to collect light. The bigger the primary mirror, the more light it can gather and the fainter the objects astronomers can see.

The world's largest optical and infrared telescopes have primary mirrors that measure about 10 meters (32 feet) across. But the Giant Magellan Telescope will more than double that diameter, with a monster primary mirror spanning almost 25 meters (80 feet).

If the Magellan is the first new-generation star gazer to be

built, it may not remain the record holder for long. Another consortium of organizations and universities is preparing to construct the aptly named Thirty Meter Telescope on the Mauna Kea summit in Hawaii, also scheduled for completion in 2018.

Trumping them all may be the European Extremely Large Telescope, dubbed "the world's biggest eye on the sky," which is to have a primary mirror 42 meters (137 feet) in diameter and is also scheduled to start operation in 2018. No site has been chosen, though Argentina, Chile, Morocco and Spain are being considered.

Astronomers hope these giants will fill in gaps in knowledge about key moments in the early days of the universe.

"Right now, we can see to almost 13 billion years [back], but our best models tell us the age of the universe is almost 14 billion years, so it's this whole epoch when galaxies are actually first starting to form that we can't really see very well," said Elizabeth Barton, an assistant professor of astronomy at the University of California, Irvine, and a member of the Science Advisory Committee for the Thirty Meter Telescope.

"So the Thirty Meter Telescope will let us do things like find some of the first galaxies to form and characterize them to figure out what the conditions were actually like and how big these things were when they were forming."

Seeing the past

Looking so far back in time may sound like science fiction, but it's possible because light travels at a finite speed and takes a certain amount of time to get from one place to another, said Marla Geha, an assistant professor of astronomy at Yale University.

In our own cosmic neighborhood, it takes the light from the sun eight minutes to reach Earth, so when you look at a beautiful sunrise, you see the star as it appeared eight minutes ago. If the sun were to suddenly go dark, you wouldn't know it for those several minutes.

The same concept of seeing objects as they appeared in the past holds true on a much bigger scale.

"The light from the nearest star [outside the solar system] takes a couple of years to get to us. The light from the farthest star in the Milky Way takes 100,000 years to get to us," Geha said.

"Since the universe is about 14 billion years old, and as

Article submissions for future issues.
Please send to Anthony at
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Night Sky Network

Astronomy Clubs bringing the wonders of the universe to the public



THE MOON

Cont from page 3

Sept. 2009

	Full moon	4
	Last quarter	12
	New moon	18
	First quarter	26

Oct. 2009

	Full moon	3
	Last quarter	11
	New moon	18
	First quarter	25

Nov. 2009

	Full moon	3
	Last quarter	10
	New Moon	17
	First quarter	23

we're looking at things that are farther away, we're looking at light that's taken half or more than half of the age of the universe to get to us."

Some of that light is from the first stars to ever form -- fascinating to astronomers because they were probably much larger and brighter than those we find in the present-day universe, Fabricant said.

Closer to home, astronomers hope to see planets orbiting other stars -- perhaps young "Earths" in the process of formation -- and observe other solar systems, he added.

Sharper than Hubble

The pictures will likely be spectacular. Despite being ground-based, all of the next-generation telescopes promise images several times sharper than those produced by the orbiting Hubble Space Telescope thanks to adaptive optics, technology that corrects for the "wiggling" of the Earth's atmosphere. Twinkling stars may be romantic to look at, but they're a big headache for astronomers trying to get a sharp picture.

One way to combat the distortion is to shoot laser beams into the sky to create fake stars and then measure how their appearance is changed by the atmosphere and take the appropriate counter-measures -- all at hundreds of times a second.

LINKS

www.badastronomy.com

www.heavens-above.com

www.nasa.gov/audience/for_kids/kidsclub/flash/index.html

www.space.com

www.astronomycafe.net

www.amsky.com

www.skyandtelescope.com

www.scopereviews.com

"You know what a perfect image looks like, you know what you observe, and then you know what you need to do to correct the image," Fabricant said.

"The idea is ... to have the mirror wiggle exactly opposite to take out the twinkling," Geha added.

Until the ground-based giants are built, Hubble's successor, the James Webb Space Telescope, will be helping to answer key questions about the universe. Webb is scheduled to be launched in 2014, about the time Hubble's mission will end.

Operating much farther from Earth and equipped with a primary mirror more than twice the diameter of Hubble's, Webb is designed to look deeper into space to see the earliest stars and galaxies, according to NASA.

Researchers on the competing projects say there's a certain rivalry about making the big discoveries but emphasize that the most important thing is that somebody makes them.

"It's a competition where you want the other guy to succeed as well," Fabricant said.

The UNITED ASTRONOMY CLUBS OF NEW JERSEY & AMATEUR ASTRONOMERS
ASSOCIATION OF PRINCETON
Present The 2009 STARQUEST & ASTRONOMY SYMPOSIUM
OCTOBER 16, 17 & 18, 2009

Scheduled Events

SATURDAY – OCTOBER 17 At UACNJ Observatory

- Noon - Welcome by Park Superintendent, Ernie Kabert, and Solar Observation
1:00 pm-“Singing Moon Rocks & Dancing Astronauts” - Lonny Buinis
2:00 pm- “Mars: Beautiful But Hostile to Life” - Dr. Mary Lou West
3:00 pm-“ The UACNJ and NJIT project at Jenny Jump” - Dr. Andrew Gerard
4:00 pm-“A Teacher’s Journey From a Neglected Six-Inch to Spitzer.” - Terry Moody
5:00 pm- Minerals, Rocks, and Meteorite Display/Geology Walk
8:00 pm- Public Night at UACNJ Observatory (Regularly scheduled event)
- "Are We Alone? Searching for other Earthlike Planets" - Dr. David Spergel

SUNDAY – OCTOBER 18 AT UACNJ OBSERVATORY

- Noon: Solar Observation
1:00 pm- “Searching the Night Sky With Binoculars” - Jim Norton
2:00 pm- “Eyewitness to Hubble/Shuttle Launch & Personal Postcards from Mars” - Dr. Ken Kremer
3:00 pm- “ The Invention & history of the Telescope” - Alan Witzgall
4:00 pm- “Solar Observing With Radio Telescopes” - Dr. Dale Gary
5:00 pm- “Remote Astrophotography” - Jim Delillo
Contact information for the symposium

Suggested donation for the symposium is \$30.00 per person \$15.00 if proof of attending STARQUEST 2009 is shown (\$20.00 for pre registration 12 and under, no donation) [checks payable to UACNJ] mail to Jim Norton UACNJ PO Box 150 Hope, NJ 07844

Two days devoted to Astronomy at the premier New Jersey site for public astronomy, the Jenny Jump/UACNJ observatories and lecture hall! Symposium, Practicum using binoculars, Solar and Radio telescopes, and a meteorite display/geology walk! Door Prizes! Food! Swap Meet!

The UACNJ is holding afternoon complimentary events to the Amateur Astronomers of Princeton 20th Annual three day Starquest at the Hope Renewal and conference center.

AMATEUR ASTRONOMERS ASSOCIATION OF PRINCETON 20TH ANNUAL JERSEY
STARQUEST

Held at the Hope Conference and Renewal Center, Hope, NJ
Beginning at 5 PM Friday, Oct. 16th, 2009 and running through 12 PM Sunday, Oct. 18th 2009 Please note: This event will take place regardless of the weather conditions!

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You can get pricing information & application form for STARQUEST at
http://www.princetonastronomy.org/starquest2008_flyer.pdf