

THE EYEPIECE

Volume 14 Issue 8. Aug. 2002

The Newsletter of the Neville Public Museum Astronomical Society



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A GLANCE OUTSIDE - August

- 01 - Last Quarter Moon
- 08 - New moon *Annular Solar Eclipse (5:23 AM)*
- 12 - Perseid Meteor Shower Peak (*100 per hour*)
- 15 - First Quarter Moon
- 22 - Full moon, *Penumbral Eclipse (4:42 PM)*
- 31 - Last Quarter Moon

WHAT'S UP IN AUGUST



AUGUST 9-11 NORTHWOODS STARFEST

If there are any spots left for the Northwoods Starfest they will cost you \$50.00 per person. Many NPMAS members are already signed up for this popular star party held at the Hobbs Observatory in Eau Claire, WI. For more information refer to the article and registration form in the June issue of this newsletter or go to the Chippewa Valley Astronomical Society's web site at www.cvastro.org. If you want to see if you can still sign up contact **Gary Baier** at 920-391-9654.

AUGUST 9-10 POW WEEKEND



The sun is starting to set a little earlier every night as we make the swing towards fall. This means more observing time and darker skies at this month's Parmentier Observing Weekend.

This is a great time of the year for observing. You can take in all the summer constellations, not worry about the cold, and if you stay up late enough you can even get a peek at some of the winter constellations. Also you might get to see some of the early Perseid Meteors! Come on out for a great time!

AUGUST 14 CLUB MEETING

This month's talk is "Star Parties". Club member **Steve Wicker** and others will talk about some of the different star parties that they have been to over the years. They will talk about what impressed and disappointed them most about each one.

Remember that club owned astronomy books and videos are also available FREE OF CHARGE at the club meetings. Happy Joes to follow!

NEW MEMBER WELCOME MAT



We had two new members join the club this past month. First is **Joe Walton**, 620 Floral Drive, Green Bay, WI, 54301 Phone: 920-437-7328. Joe is 25 and was introduced to the club through his father, Bill Walton, who is a current NPMAS member. Joe doesn't own a telescope but he shares his dad's love for the night sky (especially constellations) and hopes to learn more about it through his membership.

Next is **Madeline Heidle**, 667 Hickory Drive, Oneida, WI 54155 phone: 920-869-2799. Email: spottie04@hotmail.com

She is 15 and a student at Pulaski High School. On a recent visit to the Neville Public Museum her mother noticed our club flier and decided to sign her up.

Madeline owns a Meade digital telescope which she has used for several years. She has a general interest in astronomy and is especially interested in the moon and planets. She hopes to learn more about the hobby from fellow club members.

WELCOME JOE & MADELINE!

THE EYEPIECE

The Monthly Publication of the Neville Public Museum Astronomical Society

The *Eyepiece* is mailed directly to each member who requests it as a benefit of membership. Please submit comments, articles, and other material to:

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If you have questions or need help, here's who to call:

ASTROPHOTOGRAPHY: **TK**
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BINOCULARS: **KD, RN, WK**
CCD IMAGING: **TK**
CONSTELLATIONS: **SM, WK**
DEEPSKY OBJECTS: **DS, SM, TK**
DIGITAL SETTING CIRCLES: **DD, GM**
DOUBLE STARS: **KD, RN**
EYEPIECES: **GM**
LX200 COMPUTER SYSTEMS: **GK, TK**
SCHMIDT-CASSEGRAIN TELESCOPES: **GK, TK, WK**
REFRACTOR TELESCOPES: **SM**
MOON: **KD**
NEWTONIAN TELESCOPES: **DD, GM, RN, SM**
NEXSTAR COMPUTER SYSTEMS: **TJ**
OBSERVATORY BUILDING: **GK, GM**
PLANET OBSERVING: **KD, SM, TJ**
SOLAR OBSERVING: **KD, TJ**
STAR HOPPING: **DS, SM, WK**
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Ron's Home Phone: 920-336-5878
Ron's Mobile Phone: 920-609-3858

CRIVITZ OBSERVING SITE

Dave & Carol Jorgenson
N8764 Caldron Falls Rd., Crivitz, WI 54114
Phone: 715-757-3296 Email: djcycles@cybrzn.com

CLUB TELESCOPES

All club members are eligible to use the club telescopes. To make arrangements, contact:

10" DOBSONIAN - Ray Nancoz, 3446 Big Creek Road, Sturgeon Bay, WI 54235 Phone: 920-746-0428
Email: rayn@itol.com

8" TRIPLE AXIS - Ron Parmentier, 161 Rosemont Dr., Green Bay, WI 54301 Phone: 920-336-5878

CLUB PATCHES, VIDEOS & BOOKS

Sew-on patches with the NPMAS club logo are available for \$4.00 each. They are four inches long on all sides. Also there is a small selection of video tapes and books available to loan to club members at no cost. Please contact Dick Francini at:
Phone: 920-338-8504 email: dfrancini@pollycello.com

FROM THE INTERNET

Taken from science@nasa.gov

LOOK AT THAT ASTEROID

July 30, 2002: Relax, there's no danger of a collision, but it will be close enough to see through binoculars: a big space rock, not far from Earth.

Astronomers discovered the nearby asteroid, named 2002 NY40--not to be confused with better-known 2002 NT7--on July 14th. It measures about 800 meters across, and follows an orbit that ranges from the asteroid belt to the inner solar system. On August 18th, the asteroid will glide past our planet only 1.3 times farther away than the Moon.

"Flybys like this happen every 50 years or so," says Don Yeomans, the manager of NASA's Near-Earth Object Program office at JPL. The last time (that we know of) was August 31, 1925, when another 800-meter asteroid passed by just outside the Moon's orbit. In those days there were no dedicated asteroid hunters--the object, 2001 CU11, wasn't discovered until 77

years later. At the time of the flyby, no one even knew it was happening.

2002 NY40 is different. We know the asteroid is coming, and astronomers have time to prepare. One team of observers led by Mike Nolan at the giant Arecibo radar in Puerto Rico will "ping" 2002 NY40 with radio waves as it approaches Earth. Such data result in impressive 3D maps of asteroids, which have often surprised astronomers with their weird shapes. Some prove to be binary systems (one space rock orbiting another) and one even looks like a dog bone.

"Radar data will also improve our knowledge of the asteroid's orbit," adds Jon Giorgini, a member of the radar team from JPL. "At present, we know there's little risk of a collision with 2002 NY40 for decades. When the Arecibo radar measurements are done, the orbit uncertainties should shrink by more than a factor of 200. We'll be able to extrapolate the asteroid's motion hundreds of years into the past and into the future, too."

2002 NY40 is faint now. It shines by reflected sunlight like a 17th magnitude star. As it nears Earth, however, the space rock will brighten, soaring to 9th

PLANET WATCH by Wayne Kuhn



Mercury cannot be observed until early October.

Venus is at greatest elongation east (46 degrees) on August 22nd. It is visible only with difficulty very low in the west-southwest after sunset and sets about 1.5 hours after the sun.

Earth's Moon: Last Quarter Moon is at 5:22 AM CDT on the 1st. New Moon is at 3:15 PM CDT on the 8th. Moon reaches perigee (225,512 miles from Earth), on the 10th at 6:00 PM CDT. First Quarter Moon is on the 15th at 5:12 AM CDT. Full Moon is on the 22nd at 5:29 PM CDT. Moon reaches apogee (252,087 miles from the Earth) on the 26th at 6:23 PM CDT. A second Last Quarter Moon for the month occurs at 9:31 PM on the 30th.

Mars cannot be observed this month. It is in conjunction with the sun on August 10th.

Jupiter is in Cancer and emerges in the dawn twilight during the month. By month's end, it stands about 10 degrees above the horizon as morning twilight begins.

Saturn is in Taurus and rises after midnight in the east-northeast and stands about 25 degrees above the eastern horizon at the beginning of morning twilight.

Uranus is in Aquarius near the boarder with the constellation Capricornus this year and is at opposition with the sun on August 20th. Its southerly declination in 2002 makes it low in the sky but it still shines at magnitude 5.7, and easy binocular target.

Neptune is in the constellation Capricornus and shines at magnitude 7.8 and is at opposition on August 2nd.

Pluto lies in Ophiuchus and is magnitude 13.8.

magnitude on August 18th. That's about 16 times dimmer than the dimmest star you can see without a telescope. But as asteroids go, it's very bright.

"Asteroids are hard to see," explains Yeomans, "because they're mostly black like charcoal. The most common ones--carbon-rich C-type asteroids--reflect only 3% to 5% of the light that hits them. Metallic asteroids, which are somewhat rare, reflect more: 10% to 15%."

"We don't know yet what this asteroid is made of," he continued, "but we'll have a much better idea by the end of August." Astronomers using ground-based telescopes will have little trouble recording the asteroid's spectrum and thus its composition.

On the date of closest approach, the asteroid will sail past Vega, the brightest star in the evening summer sky. Sky watchers with powerful binoculars or small telescopes can see it--a speck of light moving 8 degrees per hour. (Note: The flyby will be visible mostly from Earth's northern hemisphere; this is not a good opportunity for southern sky watchers. North Americans can see it best after sunset on Aug. 17th; Europeans should look during the hours before dawn on Aug. 18th.)

Something extraordinary will happen hours after 2002 NY40 passes Earth: the space rock will quickly fade. Asteroids, like moons and planets, have

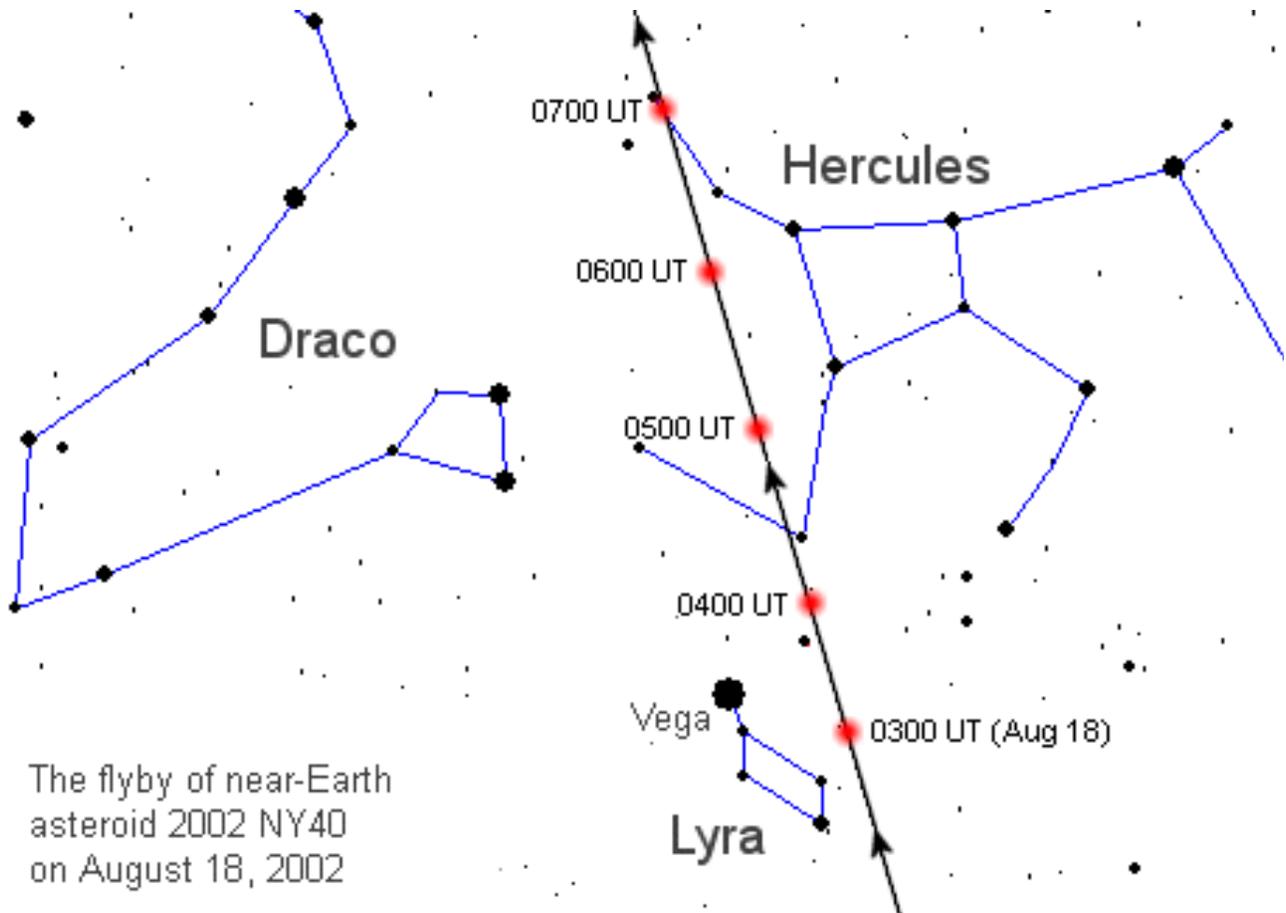
phases. The sunlit side of 2002 NY40 is facing Earth now. It's full, like a full Moon. On August 18th, the asteroid will cross Earth's orbit on its way toward the Sun. Then the phase of the asteroid will change--from full to gibbous to half.... finally the night side will turn to face Earth. The asteroid will grow dark, like a new Moon. It's not every day you can peer through binoculars and see a near-Earth asteroid--and then see it disappear. But 2002 NY40 has a lot to offer.

"Mother Nature is making it very easy for us to study this one," says Yeomans. That's good because "we need to know more about near-Earth asteroids in case we ever need to destroy or deflect one." What are they made of? How are asteroids put together? These are key questions that 2002 NY40 will help answer.

"Don't forget," adds Yeomans, "most asteroids pose no threat to Earth. But they do contain valuable metals, minerals and even water that we might tap in the future." When such asteroids come close (but not too close!) we have relatively easy access to them--both to study and, one day perhaps, to visit.

Or, to paraphrase Nietzsche, asteroids (like 2002 NY40) that do not hit us, make us stronger.

For more information about 2002 NY40, including an up-to-date ephemeris for sky watchers, please visit JPL's Near-Earth Object Program web site.



FROM THE MEMBERSHIP



CATAclySMIC VARIABLE STARS

By Anthony J. Kroes
Cedar Drive Observatory
Pulaski, WI

I have begun working on an interesting project involving variable stars. Some folks associated with Columbia University have formed a group of amateur astronomers that study special variable stars called 'cataclysmic variables' (CV for short). CV's are binary star systems where one star, usually a white dwarf, sucks material off the other star in the system like a cannibal. This in-falling material can form a swirling disk around the dwarf which is eventually drawn down to the star causing a brief flare-up as it burns up. Some have variability on the scale of mere minutes, some 30 hours or more.

From our end of the universe the star changes brightness, but in a slightly different way than 'normal' variables that pulse from the inside. To complicate things, some of these stars are ALSO regular variables, making their changes very hard to track and predict as there are multiple events happening at the same time. Included in the mix is the orbit of the feeder star which can occult the white dwarf and cause brightness changes, as well as the gravitational forces between the two stars which can alter the timing of the drawn in material. What a mess!

The project involves amateurs around the globe watching specific CV's each month. They monitor the brightness of the star with digital cameras and CCD equipment. Each clear night the astronomer takes a long series of exposures of the target star(s).

My initial test run was about 4 hours long and accumulated about 700 images of the same little patch of space. The images are then run through software that can determine the magnitude of the target star by comparing it to other stars of known brightness in the picture. By taking these measurements from each image and graphing them over time, the 'light curve' of the star appears.

Taking data from multiple astronomers over many different longitudes around the world allows for uninterrupted monitoring of the stars. Each little piece (like my 4 hour series shown below) can then be added to the others and a complete view of the star's variability can be seen.

I have only just started working on the project, but am encouraged by my initial test runs. I have forwarded the data to the project coordinator for critique and approval. If I can refine my procedures well enough to gather accurate data to contribute, I will become a regular member of the project and will work on many stars in the future. When enough data is gathered on a specific star, a paper is written and published through the normal scientific channels and anyone who collected data for the 'final' light curve for the paper is cited as a contributor.

It is kind of a weird feeling to be doing some 'real science' and contributing to a scientific endeavor instead of just looking at stuff. I still love regular observing and taking 'pretty pictures', but this science thing is pretty cool too! If you are interested in more information on cataclysmic variables, or the project in general, please check out the Center for Backyard Astrophysics (CBA) website at: <http://cba.phys.columbia.edu/>. I hope to be listed there with the other members soon and will keep you updated both here and at the club meetings about my progress.

