



# ASTRAL PROJECTIONS

January 2011  
Volume 22 Issue 1

## Meeting Schedule

### January 14<sup>th</sup> 2011 Meeting:

"Telescope Workshop" +  
Public Star Party.

Closed since the end of 2007,  
the Novins Planetarium is  
back!

Date: Friday, 1/14/2011

Time: 7:00 PM - 10:00 PM

Location: Robert J. Novins  
Planetarium, College Drive,  
Ocean County College, Toms  
River, NJ 08754

### February 11<sup>th</sup> Meeting:

Awards Presentation + Public  
Star Party

Date: Friday, 2/11/2011

Time: 7:00 PM - 10:00 PM

Location: Robert J. Novins  
Planetarium, College Drive,  
Ocean County College, Toms  
River, NJ 08754

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## CONGRATULATIONS!

TO

## EUGENE RUSSO

RECIPIENT OF THE

## DR. R. ERIK ZIMMERMANN AWARD

FOR HIS DEDICATION AND CONTRIBUTIONS TO THE  
ASTRONOMICAL SOCIETY OF THE TOMS RIVER AREA.

## WE THANK YOU!



## Eugene Russo

Recipient of the "Dr. R. Erik Zimmermann Award" passed away on  
December 7, 2010 at his home with his family by his side. His  
dedication to our club and wonderful friendship will surely be missed.

## Total Eclipse of the Moon, December 20–21, 2010

It had been almost three years since those of us in North America saw a  
total lunar eclipse. On December 20-21 Monday night into Tuesday  
morning, the whole continent got to witness another one. The Earth's  
shadow totally engulfed the Moon from 2:41 to 3:53 a.m.

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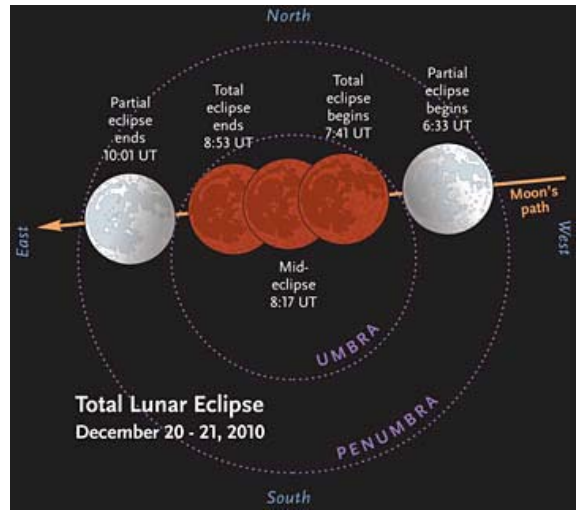
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Unlike a solar eclipse, each stage of a lunar eclipse is visible to everyone on the Moon-facing side of Earth. The Moon was at the northernmost part of the ecliptic, north of Orion between the feet of Gemini and the horns of Taurus. An eclipsed Moon is always full, so when the eclipse happened in the middle of the night, the eclipsed Moon looked to be about straight overhead.

A total lunar eclipse has five distinct stages. It begins when the Moon first enters the *penumbra*, or pale outer fringe, of Earth's shadow. But this event is unobservable; the shading in the outer part of the penumbra is extremely slight. Not until the Moon's leading edge is about halfway across the penumbra does the first slight dimming become detectable to the eye.

The second stage, partial eclipse, starts when the Moon's edge reaches the *umbra*, or Earth's inner shadow. Few sights in astronomy are more eerie and impressive than watching this black-red shadow creeping, minute by minute, across the bright lunar landscape. You'll notice that Earth's shadow has a curved edge visible proof that the world we live on is round. As more of the Moon slides into the umbra, hundreds of additional stars start appearing in what earlier was a bright, moonlight-washed sky. An hour or so into partial eclipse, only a final bright sliver of Moon remains outside the umbra and the rest of it shows an eerie reddish glow.

The third stage, *totality*, begins when the last bit of Moon slips into the umbra. For this eclipse, totality lasted a generous 72 minutes.



Then, as the Moon continued moving eastward along its orbit, events unwind in reverse order. Totality ends when the Moon's leading edge reemerges into sunlight, returning once again to a partial eclipse (stage four). Then, after all of the Moon escapes the umbra, the dusky penumbral shading (stage five) gradually fades away, leaving the full Moon shining as brightly as if nothing had happened.

### Red in the Darkness

The umbra is the part of Earth's shadow where the Sun is blocked from the Moon completely. So why does the Moon here glow deep orange or red, rather than being completely blacked out?

That red light you see on the Moon during a lunar eclipse comes from all the sunrises and sunsets that ring the Earth at the time. Our atmosphere scatters and *refracts* (bends) the sunlight that grazes the rim of our globe, sending it into Earth's shadow. If you were an astronaut on the Moon, the situation would be obvious. You would see the Sun covered up by a dark Earth that was ringed all around with a thin, brilliant band of sunset- and sunrise-colored light. On rare occasions the eclipsed Moon does go black. Other times it appears as bright and coppery orange as a fresh penny. And sometimes it turns brown like chocolate, or as dark red as dried blood. Two factors affect an eclipse's color and brightness. The first is simply how deeply the Moon goes into the umbra. The center of the umbra is much darker than its edges. This time the Moon will pass fairly deep through the umbra, and at mid-eclipse the Moon's southern limb almost reaches the umbra's center. The other factor is the state of Earth's atmosphere along the sunrise-sunset line. If the air is very clear, the eclipse is bright. But if a major volcanic eruption has polluted the stratosphere with thin haze, the eclipse will be dark red, ashen gray, or blood-black.

In addition, blue light refracted by Earth's clear, ozone-rich upper atmosphere can also add to the scene, especially near the umbra's edge, creating a subtle mix of changing colors. Such variable shading can give the eclipsed Moon a very three-dimensional appearance. The next total lunar eclipse for the whole continent doesn't come until April 14-15, 2014 — an unusually long wait.

# Whats up this month?

## January 2011 Celestial Events

**1<sup>st</sup> Dawn:** The waning crescent Moon sits far below Venus on New Year's morning. Antares and Mercury are also in the scene.

**1<sup>st</sup> -11<sup>th</sup> Dawn:** Mercury shining more than 10 deg. above the southeastern horizon a half hour before sunrise on these days.

**2<sup>nd</sup> -5<sup>th</sup> Evening:** Binoculars or telescope shows 5.9-magnitude Uranus within ½ deg. of Jupiter.

**3<sup>rd</sup> Daytime:** Earth passes through *Perihelion*, its closest point to the Sun for the year, around 2pm EST.

**4<sup>th</sup> Predawn:** the Quadrantid meteor shower peaks.

**4<sup>th</sup> New Moon (4:03 am EST.)**

**9<sup>th</sup> Evening:** The waxing crescent Moon is right or lower right of Jupiter. Callisto and Europa are both in front of Jupiter from 7:49 to 8:13pm EST.

**10<sup>th</sup> Evening:** The Moon is upper right of Jupiter.

**12<sup>th</sup> First-Quarter Moon (6:31 am EST.)**

**19<sup>th</sup> Full Moon (4:21pm EST.)**

**25<sup>th</sup> Predawn:** The waning Moon is right of Saturn and Spica, forming a triangle.

**26<sup>th</sup> Last-Quarter Moon (7:57am EST.)**

**29<sup>th</sup> Dawn:** The crescent Moon is close to Venus looking southeast.

## ASTRA Public Outreach & Star Parties Schedule for December

### Jakes Branch Star Party

Public Outreach

Date: Friday, 1/7/2011

Time: 6:30 PM - 9:00 PM

Location: Jakes Branch County Park, Double Trouble Rd,  
Beachwood, NJ 08722

### Telescope Workshop

Did you get a new telescope for the Holidays? Do you have one hiding in your closet that's collecting dust? Come on out for a chance to learn to set-up and make the most of your telescope.

Date: Friday, 1/14/2011

Time: 7:00 PM - 10:00 PM

Location: Robert J. Novins Planetarium, College Drive, Ocean  
County College, Toms River, NJ 08754

**Call the ASTRA Hotline 609-971-3331 or check the online message board on the date of the star party for up to date information on these events.**



Astronomical League National Headquarters

9201 Ward Parkway; Suite 100

Kansas City, MO 64114

1-816-333-7759 or [www.astroleague.org](http://www.astroleague.org)

The REFLECTOR is published in March, June, September and December. If you do not receive your copy of the REFLECTOR magazine, contact Astronomical League Coordinator (Alcor) Ro Spedalieri (Treasurer@astra-nj.org) or the ASTRA Hotline 609-971-3331 and leave a message.

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## ASTRA Library of Books & DVD's

The following books and DVD's are available to borrow for one month at a time. Request for these items must be made prior to our regular meeting and returned the following meeting. Please e-mail your request for these items to John Endreson [webmaster@astra-nj.org](mailto:webmaster@astra-nj.org) or call the ASTRA Hotline 609-971-3331

### BOOKS

#### 1) **The National Air and Space Museum**

Second Edition by C.D.B. Bryan

#### 2) **Milestones of Aviation** Smithsonian

Institution National Air and Space Museum

#### 3) **New Atlas of the Moon** by Serge

Brunier (Author), Thierry Legault (Photographer).

#### 4) **Encyclopedia of space** by National

Geographic

#### 5) **The Real Mars** by Michael Hanion

### DVD's

#### 1) **Parts 1&2 Understanding the Universe What's New in Astronomy**

2003 Taught by: Professor Alex Filippenko. Each part has 8 lectures, 45 minutes per lecture.

#### 2) **Parts 1 to 5 Understanding the Universe An Introduction to Astronomy**

Taught by: Professor Alex Filippenko each part has 8 lectures, 45 minutes per lecture.

#### 3) **COSMOS**

In his "ship of the imagination," Carl Sagan guides us to the farthest reaches of space and takes us back into the history of scientific inquiry in the course of 13 fascinating hours.

For a complete list of books and DVD's, visit our website or Call the ASTRA Hotline at 609-971-3331.

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## Club Telescopes



A.S.T.R.A. owns four small telescopes

6-inch Dobsonian

8-inch Dobsonian

80mm Celestron Refractor

120mm EQ AstroView Refractor.

These telescopes are available for club members to borrow and use for a month or two at a time.

## Wanted!

No longer used telescopes, Telescope parts, and accessories.

Call the ASTRA Hotline at 609-971-3331  
We will come and pick-up your used equipment.

## ASTRA-WEAR: For Embroidered and/or Printed items With the ASTRA Logo



You can see some samples at ASTRA meetings. To order by mail: Shelter Cove Embroidery Co. 1333 Bay Ave Toms River, NJ 08753 call 732-506-7700 or E-mail [astra-wear@estitches.com](mailto:astra-wear@estitches.com)



# ASTRA Membership Application Form

Thank you for your interest in the Astronomical Society of the Toms River Area. Please read carefully and fill in the appropriate information below.

ASTRA reserve the right to deny admission or revoke the membership of individuals convicted of a sex offense.

Returning members Annual dues- \$ 25.00 from (January to December): (\$\_\_\_\_\_)

New membership- \$ 30.00 from (January to December):

New membership- \$ 20.00 from (July to December): (\$\_\_\_\_\_)

Telescope fund assessment of ( \$ 5.00 ) a *one-time* assessment

“required of all new members” optional for returning members)  (\$ 5.00 )

**TOTAL AMOUNT PAID (as determined by the above schedule):** (\$\_\_\_\_\_)

***PLEASE MAKE CHECKS PAYABLE TO ASTRA.***

**NAME** \_\_\_\_\_ **PHONE ( )** \_\_\_\_\_

**ADDRESS** \_\_\_\_\_

**CITY** \_\_\_\_\_ **STATE** \_\_\_\_\_ **ZIP** \_\_\_\_\_

Check here if you wish to receive a paper copy of our Newsletter.

Check here if you wish to receive an e-mail copy of our Newsletter.

**E-MAIL ADDRESS (if applicable)** \_\_\_\_\_

By filing this application with ASTRA, you are indicating that you have not been convicted, adjudicated delinquent or found not guilty by reason of insanity of a sex offense.

I declare that to the best of my knowledge all particulars supplied by me are correct and complete.

**APPLICANT SIGNATURE** \_\_\_\_\_

Send this application form with your dues payment to:

**Robert J. Novins Planetarium  
ATTN: ASTRA  
Ocean County College  
Toms River NJ 08754-2001**