



# The Observer

A Publication of The Cuyahoga Astronomical Association  
PO Box 868, North Olmsted, OH 44070

CAA Homepage: <http://www.geocities.com/cuyastro>

## CAA Officers

President:  
Vice President:  
Treasurer:  
Secretary and Editor, The Observer:  
Observatory Director:  
Board Member:  
Board Member:  
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## 2002 CAA Calendar - Summary

9/9/02 7:30 p.m.	CAA General Membership Meeting – RRNC
9/30/02 7 p.m.	CAA Board Meeting – Starbucks
10/5/02 7 p.m.	CAA Presentation and Star Party – Letha House
10/14/02 7:30 p.m.	CAA General Membership Meeting – RRNC
10/26/02 5 p.m.	Halloween Bonfire – Plum Creek
10/28/02 7 p.m.	CAA Board Meeting – Starbucks
11/9/02	Twilight to Midnight – The Chalet in the Cleveland Metroparks
11/11/02 7:30 p.m.	CAA General Membership Meeting – RRNC
11/25/02 7 p.m.	CAA Board Meeting – Starbucks
12/9/02	CAA Christmas Party – U.S. Coast Guard Club
	No Board Meeting in December

## 2002 CAA Calendar - Detail

### Monday, September 9

CAA General Membership Meeting at 7:30 p.m. in the Cleveland Metroparks Rocky River Nature Center. CAA member Art Nenadal will be our speaker this month. Art will present "Meteors!"

### Monday, September 30

CAA Board Meeting at 7 p.m. at Starbucks Coffee Co. Starbucks is located at 24950 Lorain Road, just west of Columbia Road in North Olmsted.

### Saturday, October 5

CAA presentation and star party at 7 p.m. at the Letha House Warm Up Room and CAA Observatory. Thirty Girl Scouts from North Olmsted will be attending this public program. Please bring your telescopes for the public star party that will follow the presentation. We need a speaker for this event. Please make Al Matyas' job easier by considering giving a talk for this event. If you are interested in giving a talk, please contact Al.

### Monday, October 14

CAA General Membership Meeting at 7:30 p.m. in the Cleveland Metroparks Rocky River Nature Center. Program to be announced.

### Saturday, October 26

It's that time of year again. Once again the Brunswick Hills Fire Department and the Medina County Park District are sponsoring the annual Halloween Bon Fire from 5 p.m. to 8 p.m. at Plum Creek Park which is just south of Sleepy Hollow Road on Plum Creek Parkway in Brunswick. It will be held rain or shine. A map will be provided in the October issue of *The Observer*. The CAA will provide telescopes at dusk for public stargazing. This event is usually well published and attended, so we will need a strong turnout with your telescopes.

### Monday, October 28

CAA Board Meeting at 7 p.m. at Starbucks Coffee Co. Starbucks is located at 24950 Lorain Road, just west of Columbia Road in North Olmsted.

### Saturday, November 9

Annual Twilight to Midnight event in the Cleveland Metroparks at The Chalet Recreation Area. The Chalet is located at 16200 Valley Parkway in Strongsville. The CAA will provide telescopes for public stargazing at dusk. This event is usually well published and attended, so we will need your telescopes. More details and a map will be provided in the October issue of *The Observer*.

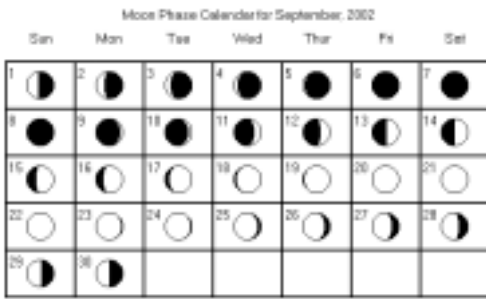
### Monday, November 11

CAA General Membership Meeting at 7:30 p.m. in the Cleveland Metroparks Rocky River Nature Center. CAA member Chuck Reinhart will lead a Round Table Discussion Recap of the 2001 Leonid meteor shower.

### Monday, November 25

CAA Board Meeting at 7 p.m. at Starbucks Coffee Co. Starbucks is located at 24950 Lorain Road, just west of Columbia Road in North Olmsted.

**Sky Events for September 2002**



**Sunday, September 8**

The moon passes 9° north of Mercury, 1 p.m. EDT.

**Monday, September 9**

The moon passes 8° north of Venus, 10 p.m. EDT.

**Saturday, September 14**

Asteroid Eunomia is at opposition, 1 a.m. EDT.

**Tuesday, September 17**

The moon passes 4° south of Neptune, 5 a.m. EDT.

**Wednesday, September 18**

The moon passes 4° south of Uranus, 2 p.m. EDT.

**Monday, September 23**

Autumnal equinox is at 12:55 a.m. EDT.

**Thursday, September 26**

Venus is at greatest brilliancy (magnitude -4.6), 7 a.m. EDT.

**Friday, September 27**

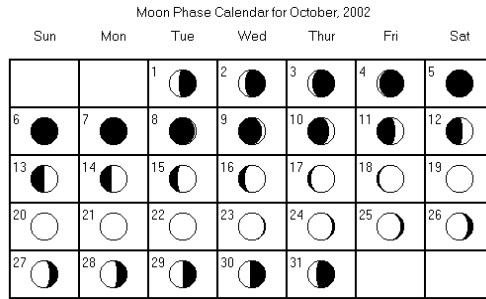
Mercury is in inferior conjunction, 3 p.m. EDT.

Asteroid Melpomene is at opposition, 9 p.m. EDT.

**Saturday, September 28**

The moon passes 3° north of Saturn, 11 p.m. EDT.

**Sky Events for October 2002**



**Wednesday, October 2**

The moon passes 4° north of Jupiter, 3 a.m. EDT.

**Thursday, October 3**

Asteroid Juno is in conjunction with the sun, 6 p.m. EDT.

**Friday, October 4**

Asteroid Ceres is at opposition, 4 a.m. EDT.

The moon passes 4° north of Mars, 9 p.m. EDT.

**Tuesday, October 8**

The moon passes 10° north of Venus, 6 a.m. EDT.

**Thursday, October 10**

Venus is stationary, 5 a.m. EDT.

**Friday, October 11**

Saturn is stationary, 9 a.m. EDT.

**Sunday, October 13**

Mercury is at greatest western elongation (18°), 4 a.m. EDT.

**Monday, October 14**

The moon passes 5° south of Neptune, 10 a.m. EDT.

**Tuesday, October 15**

The moon passes 4° south of Uranus, 6 p.m. EDT.

**Monday, October 21**

Orionid meteor shower peaks.

**Saturday, October 26**

The moon passes 3° north of Saturn, 5 a.m. EDT.

**Sunday, October 27**

Mercury passes 4° north of Spica, 4 a.m. EST.

**Tuesday, October 29**

The moon passes 4° north of Jupiter, 5 p.m. EST.

**Thursday, October 31**

Venus is in inferior conjunction, 7 a.m. EST.

The moon passes 1.3° north of Vesta, 7 p.m. EST.

**Club News / Stories**

**Cuyahoga Astronomical Association  
Financial Report  
September 4, 2002**

Bank Account Balance 8/4/02	\$2507.10
Cash On Hand 8/4/02	\$ 420.99
Total Assets 8/4/02 (approx)	\$2928.09
Bank Account Activity:	
Deposits:	
8/10/02 Memberships, Transfer from Cash	\$ 326.00
8/16/02 Interest	\$ 1.13
Expenditures:	
8/13/02 Refreshments	\$ 26.22
8/26/02 Newsletter	\$ 110.94
8/29/02 Sky Publishing	\$ 29.95
8/29/02 The Royal Astronomical Society of Canada	\$ 405.00
Bank Account Balance 9/4/02	\$2262.12
Petty Cash Activity:	
Deposits:	
None	
Expenditures:	
8/10/02 Transferred to Checking	\$ 311.00
Cash On Hand 9/4/02	\$ 109.99
Total Assets 9/4/02 (approx)	\$2372.11
Bank Account Balance Includes	
Observatory Fund Donation	\$ 200.00
Available Assets	\$2172.11

Art Nenadal, Treasurer

**November Elections**

This November the offices of President, Treasurer, and a Board Member will be filled through elections at our November general membership meeting. Each position has a term of two years.

The following officer's terms end December 31, 2002:

1. President: Bob Wiersma. Bob is not interested in serving another term.
2. Treasurer: Art Nenadal. Ted Sauppe has volunteered to run for Treasurer.
3. Board Member: Ted Sauppe. As noted above, Ted is interested in running for Treasurer. Bob Wiersma has expressed some interest in running for board member.

Thanks to all who have volunteered to run for office this November.

Newly elected officers' terms will begin January 1, 2003, and end December 31, 2004.

**Anyone who is interested in volunteering and running for any of these positions please let one of our current officers know. We would like to see more names on the ballot, so please consider stepping up to the plate and running for one of these positions. Any member in good standing who has been a member of the club for at least one year is eligible.**

### It's CAA membership dues time again again

It's that time of year again. Your membership expires at the end of this year. So before you blow your budget on Christmas shopping, please drag out your old checkbook and renew your membership with us. The board has held membership dues at their current levels for 2003. Dues should be paid by November 1 of each year.

Remember that we offer you the exceptional opportunity to renew existing magazine subscriptions to *Astronomy* and *Sky & Telescope* at a good discount. Now is a good time to check what subscriptions you want. Don't forget to include your subscription number or mailing address label from the magazine for your current subscription so you won't be seen as a new subscriber. If you don't pay by October 1, 2002, we can't guarantee uninterrupted service for your magazine subscriptions. Your new subscription will be

new subscription will be tagged onto the end of your current subscription.

You can also purchase one of the best observing handbooks printed, *The Observer's Handbook* by The Royal Astronomical Society of Canada, at a good discount as well.

Also included with your club membership is a 10% discount on books and products from the Sky Publishing Catalog or S&T's Online Store. To receive the 10% discount, identify yourself as a club subscriber and provide the name of our club. Sky Publishing will verify our participation in the Plan.

So please fill out the attached "2003 CAA Membership Dues & Subscription Order Form", and either bring it with you to one of our upcoming general membership meetings, or mail it to our P.O. Box, which is on the form.

### Looking Up By Charles H. Grace

#### HUBBLE WORDS

**HUBBLE, EDWIN POWELL:** 1889-1953. American Astronomer.

**HUBBLE SPACE TELESCOPE:** Cassegrain type, 2.4 meters in diameter. Launched into a 600 km orbit in 1990. The first of NASA's four great orbiting observatories. The other three are intended for gamma rays, X-rays, and infrared radiation.

**HUBBLE FLOW:** The outward streaming motion of all galaxies due to the cosmological expansion.

**HUBBLE DIAGRAM:** A plot of the redshift of galaxies against their distance (or of redshift against apparent magnitude, which is a rough measure of galactic distance).

**HUBBLE'S LAW:** The radial velocity of a galaxy outside the Local Group is proportional to its distance from Earth.

**HUBBLE CONSTANT:** The rate at which the expansion velocity of the universe changes with distance. (The slope of the Hubble diagram.)

**HUBBLE TIME:** The inverse of the Hubble constant has the units of time, and is a measure of the age of an open universe.

**HUBBLE CLASSIFICATION:** Hubble's scheme for classifying galaxies. Three main types: elliptical, spiral and barred spiral. Each has subtypes.

**HUBBLE'S VARIABLE NEBULA (NGC 2024):** A fan-shaped "reflection nebula" that is illuminated by a variable star.

*Reference: V. Illingworth, 3d Ed.*

### Orbits in Space

The following article was submitted by Les Kee from the NASA web site.

#### **Synchronous Orbits**

All space orbits obey the laws of Kepler and Newton. As already noted, for circular orbits Kepler's third law may be written  $T = 5063 \text{ seconds } R^{3/2} = 5063 \text{ seconds } R * \text{SQRT}(R)$  where T is the orbital period, \* marks multiplication, R is the orbit's radius in units of Earth radii (= 6371 km) and SQRT(R) is the square root of R.

From this one finds that for  $T = 86400 \text{ sec} = 24 \text{ hours}$ ,  $R = 6.6 \text{ Earth radii}$ . An equatorial satellite at this distance has a period of 24 hours and therefore, as the Earth rotates, it stays above the same point on the Earth's equator. Such an orbit is ideal for a communication satellite, for then a "satellite dish" linked to it need not track it across the sky, but can stay pointed in a fixed direction.

It was the British science fiction writer Arthur Clarke who first proposed the use of this "synchronous" orbit, long before the first artificial satellites. Clarke later wrote the book "Fountains of Paradise" (set in Sri Lanka, to which he had moved) in which thin cables linked synchronous satellites to the ground. A material strong enough and light enough for such cables does not exist, and is so far beyond anything known that it is probably impossible; but it makes a good story. About 200 satellites now inhabit synchronous orbit, some owned by governments for their own use, many operated by telecommunication companies.

#### **Atmospheric Re-entry**

The Kepler formula also applies to elliptical motion, provided R is replaced by the semi-major axis a of the orbit. Over time however orbits stray

stray from exact Keplerian ellipses because to additional forces, such as the attraction of the Moon and the Sun. For elongated ellipses, this causes the lowest point in the orbit ("perigee") to move up and down, ultimately reaching the atmosphere and causing satellite to be lost.

Atmospheric friction also causes low-altitude satellites to re-enter, sooner or later: all these, as they lose energy, descend deeper and deeper into the atmosphere, and ultimately reach denser regions, where they burn up. That was the fate of the Skylab space station in 1980: NASA had hoped to use the Space Shuttle to boost it into a higher orbit, but the shuttle was not ready on time.

Meanwhile the peak of the 11-year sunspot cycle arrived, a more active peak than NASA had hoped for, bringing a greater intensity of solar x-rays and extreme ultra-violet radiation. These radiations are absorbed in the uppermost fringes of the atmosphere, heat them up and make them expand outwards, more at "solar maximum" than at other times. Their expansion increased the air resistance ("drag") to the motion of Skylab and caused its early demise.

### The Bulge of the Earth

If the Earth were a perfect sphere, orbit calculations could assume that all its mass was concentrated at its center: the force, at least outside the Earth, would have been exactly the same. However, the centrifugal force associated with the Earth's rotation makes it slightly non-spherical, wider across the equator by a few kilometers than from pole to pole.

That modifies the orbits of satellites and must be taken into account. When the orbital plane is inclined to the equator, the equatorial bulge slowly rotates it around the Earth: a line perpendicular to the orbit plane gradually traces a cone. Interestingly, there exists a situation where one can take advantage of this rotation.

Ordinarily, a satellite's orbit is fixed in space, and as the Earth goes around the Sun, its orientation relative to the Sun constantly changes. Take for example the case of a low altitude sat-

ellite whose orbit plane contains the axis of the Earth (i.e. it passes right above the north and south poles). If in June that plane happens to be lined up with the dawn-dusk direction, i. e. the division between the sunny side of Earth from the shaded one, then in September it matches the noon-midnight direction, a rotation of 90 degrees. Note that the June orbit enjoys 24-hour sunlight, but the September orbit does not.

However certain orbits exist, passing just a few degrees from the poles, whose planes are rotated by the bulge of the Earth by exactly one rotation per year. Such "sun synchronous" orbits, can be made to always face the Sun, or always go through midnight. The DMSP satellites have such orbits (the picture here, of the aurora above the Great Lakes, was taken by one of these satellites; note Florida at bottom right), and so did Magsat.

Earth observation satellites such as Landsat and SPOT (Satellite Pour l'Observation de la Terre) also prefer sun-synchronous orbits, which ensure that images from different dates are always taken at the same time of the day. Without this, the difference in the shadows may confuse their interpretation.

## The Beer And Ice Cream Diet

### by Jerry Skala

This has been shamelessly copied from the Internet and has been around the block so many times that it has no attribution. But it certainly bears repeating, so I present to you "The Beer and Ice Cream Diet".

As we all know, it takes 1 calorie to heat 1 gram of water 1 degree centigrade. Translated into meaningful terms, this means that if you eat a very cold dessert (generally consisting of water in large part), the natural processes which raise the consumed dessert to body temperature during the digestive cycle literally sucks the calories out of the only available source, your body fat.

For example, a dessert served and eaten at near 0 degrees C (32.2 degrees

F) will, in a short time, be raised to the normal body temperature of 37 degrees C (98.6 degrees F). For each gram of dessert eaten, that process takes approximately 37 calories as stated above. The average dessert portion is 6 oz, or 168 grams. Therefore, by operation of thermodynamic law, 6,216 calories (1cal./gm/deg. x 37 deg. x 168 g) are extracted from body fat as the dessert's temperature is normalized.

Allowing for the 1,200 latent calories in the dessert, the net calorie loss is approximately 5,000 calories. Obviously, the more cold dessert you eat, the better off you are and the faster you will lose weight, if that is your goal.

This process works equally well when drinking very cold beer in frosted glasses. Each ounce of beer contains 16 latent calories, but extracts 1,036 calories (6,216 cal. per 6 oz. portion) in the temperature normalizing process. Thus, the net calorie loss per ounce of beer is 1,020 calories. It doesn't take a rocket scientist to calculate that 12,240 calories (12 oz. x 1,020 cal./oz.) are extracted from the body in the process of drinking a can of beer.

Frozen desserts, e.g., ice cream, are even more beneficial, since it takes 83 cal./gm to melt them (i.e., raise them to 0 deg. C) and an additional 37 cal./gm to further raise them to body temperature.

The results here are really remarkable, and it beats running hands down. Unfortunately, for those who eat pizza as an excuse to drink beer, pizza (loaded with latent calories and served above body temperature) induces an opposite effect. But, thankfully, as the astute reader should have already reasoned, the obvious solution is to drink a lot of beer with pizza and follow up immediately with large bowls of ice cream.

We could all be thin if we were to adhere religiously to a pizza, beer, and ice cream diet. Oh, that it were that easy! This would be so nice, but, of course, it doesn't work this way. But, why not? OK, you science types out there, what is wrong with this logic? Why doesn't it work this way? I promise an answer ... next month.

## CAA Logo T-Shirts and Red LED Reflectors Still Available

We still have some CAA logo T-Shirts and red LED reflectors for sale. T-Shirts are \$10 each (\$12 for XXL), and the red LED reflectors are \$5 each. See Al Matyas at one of our upcoming meetings if you are interested.

## Schuele Planetarium Star Parties

On the 1<sup>st</sup> and 3<sup>rd</sup> Saturday of each month there are Schuele Planetarium star parties at dusk following the 7 p.m. Planetarium shows. CAA members are welcome to bring their scopes to help out at the star parties in the field across the street from the Schuele Planetarium. Any CAA members that could help out would be greatly appreciated by Jay Reynolds and the Lake Erie Nature and Science Center.

## Swap Corner

For Sale: I have a homebuilt pipe fitting equatorial mount with tripod and cradle for sale. It can carry up to a 10" Newtonian optical tube assembly. The tripod head and legs were made by Norm Oberle a number of years ago. The whole assembly is very stable and is easy to transport and set up. This is a ready-to-use mount/tripod. There are four 5 pound counterweights and shaft that threads into the declination fitting. These are also included. My asking price is \$100.00 for everything though I am willing to negotiate a little on the price. If interested, please contact Ken Hubal at (216) 398-0912.

### Upcoming Astronomical Events

## Other OTAA Meetings

Saturday, September 14, 2002 (new date): Black River Astronomical Society OTAA meeting at the Birmingham Methodist Church Hall, Birmingham, Ohio. Rain or Shine. Doors open 4:30 p.m. Several tables will be provided for a Flea Market. Pot Luck Dinner – 5:30 p.m. Bring a dish to pass, beverage, and table setting. BRAS will

BRAS will once again be grilling hot dogs for all, with the always popular "dogs at midnight" later in the evening. Door Prizes 6:30 p.m. Star Party to follow. There is a large open field adjacent to the meeting hall. There are great horizons and the sky is dark. Bring your telescope and enjoy convenient dark sky viewing. Directions: Take the Ohio Turnpike and exit at 7A (Baumhart Rd.). Go south on Baumhart to Rt. 113, then head west to Birmingham. Turn left (south) at the first street over the bridge as you enter Birmingham. Continue on South St. as it curves to the right, and the meeting hall will be on the left.

Friday & Saturday, October 4/5, 2002: Richland Astronomical Society Hidden Hollow convention at the Hidden Hollow Campground in Mansfield, Ohio.

## CWRU Nassau Observatory Public Nights

Every summer the observatory, in cooperation with the Geauga Metroparks and the Chagrin Valley Astronomical Society, holds several public nights. Here is the schedule for this summer:

Friday, September 27<sup>th</sup>

Rainout dates are the following Saturdays.

The public is permitted to view through the 36" reflector in the observatory, and the Chagrin Valley club usually has at least ten additional telescopes available for viewing on site.

Because of limited parking, reservations must be made through the Geauga Metroparks at 440-286-9540. Call early. This event fills up very quickly.

The observatory is on Clay Street in Chardon. Additional information may be obtained by calling the metroparks at the above number, by checking with the Chagrin Valley club, or by checking the CWRU web site: <http://astrwww.astr.cwr.edu/nassau/nassau.html>

Art Nenadal has attended several of these and can also fill in whatever details you may require.

### Other News / Stories

## Note From The Desk of The Editor

I am always looking for articles for *The Observer*. If there are any aspiring authors out there who want to contribute an article, share a story or observation, etc. please do so, and I will include it in the next issue. Also, if you have any items for sale, or if you are looking for any items, send these in and I will include them in the *Swap Corner*. Remember, this is your newsletter, and participation from the general membership can only make the newsletter better. Thanks to all who have taken the time to send in articles. Please send articles, items for sale, items wanted, suggestions, and/or comments to:

Jeff Lewis

5623 Allendale Drive

North Olmsted, OH 44070-4622

Or you can send them via e-mail to

[bruisse@ameritech.net](mailto:bruisse@ameritech.net).

Thanks and Clear Skies!