

# THE SPECTRUM

Newsletter of the Buffalo Astronomical Association Inc.

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Buffalo, New York

Jan - Feb 1997

## MEETINGS NOTICE

FRIDAYS: JAN 10, FEB 14

**Jan 10th: "High Resolution Lunar Video"** - BAA member Gene Witkowski will describe how anyone with a little patience and know-how can produce very dramatic video recordings of our nearest neighbor in space, the Moon. Although Gene has many years of experience recording and processing videos of the Moon and planets, he'll explain how an initial foray into the world of "astrovideo" can be done with nothing more than a telescope, a surveillance camera, and a VCR. Gene will also be showing us his latest results including the craterlets in Plato and the rille in the Alpine Valley.

**Feb 14th: "Shoot the Sun"** - Were talkin' solar imaging! Experienced amateur Greg Saxon is coming from St. Catharines, Ontario to present how he has shot the sun using photography to CCD. Techniques, problem solving and great images are on tap. Shake those winter blues and catch some rays!

**Mar 14th: Annual Dinner Meeting** - Ivan Scmeniuk who heads astronomy programming for the Ontario Science Center will talk on comets and upcoming Comet Hale-Bopp in particular. The restaurant and menu are being finalized and will be announced at the January meeting and in the next SPECTRUM.

Meetings: 2nd Fridays @ 7:30 pm Sep-June.

Location: New Science Building Auditorium at Buffalo State College on Elmwood Ave.

We hope to see you at these meetings.  
As usual refreshments will follow.

Bring a friend and come on down!

## Use the Club's CCD Camera!

Unfortunately this photo is seen on a xerox copy. It does not do it justice! Get a copy from Dan (at the meeting) and see for yourself.

*It's mind-blowingly awesome on the computer screen!!*

Taken in December by Dan and his merry CCD class of John Manno, Frank C. and Bill Aquino. It is a combination of 40 10-second CCD exposures piled on top of each other. Short exposures keep "blooming" or streaking of bright stars to a minimum. Lots of exposures give the "stacked" image enough image density for image processing.

Dan uses SuperCalc which tracks the image (talks to the autoguider) and also "stacks" all the images together. He then uses SuperFix to do the image processing. Dark frames and flat fielding are used to correct for chip defects and varying pixel response. Dan says it's easy to get an image this good. Dan admits he barely knows what he's doing and is learning all the time. (He said I could say that.)

Does all this sound like mumbo-jumbo? It becomes clear when you give it a try yourself. Dan holds CCD classes every month or so — give him a call at 773-5015.



*M1, the Crab nebula, can be a challenge just to detect from the city. From the country it is a gauzy wisp in a 4"-6" scope and won't show this much detail even in our club's 20". The PC image, not this repro, is about what I saw from Florida through a 36" f/5 Dobson at 350X. This image is an eyepiece-ful! You too can do it with the club's CCD camera on the 12" scope.*

— Bill Smith

## MEETINGS CANCELLATION POLICY

If, for any reason, (most likely snow or ice storms), there might be cause for cancellation of the meetings of the B.A.A., tune your radio to either WBEN (930) or WGR (550). Also if Buffalo State College has been closed due to inclement weather, so will the meeting of the B.A.A. be cancelled.

## BEAVER MEADOW TELEPHONE

The telephone at Beaver Meadow, 716-457-3104, is for emergency use only at no cost. Local calls may be placed for a small charge - see the collection box by the phone. This phone cannot make long distance calls.

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TAXACOM computer bulletin board - 716-896-7581  
for more information call Jack Empson at 716-745-3138

**MEMBERSHIP CORNER***Joe Orzechowski*

I hope that everyone had a very enjoyable holiday season! Although the timing for such a wish may seem correct to you, it seems rather odd to me. You see, I can't say what my Christmas was (will be?) like since it hasn't happened yet. It's an anachronism that has to be dealt with when writing an article that won't be published until some weeks later. Another peculiarity that I, as membership chairperson, must deal with at this time of the year is deciding how many BAA members there are. At first glance this might seem like a relatively simple task especially with a computerized member database. The difficulty arises at renewal time (I'll bet you were wondering when I was going to bring that up) because I don't know whether or not to include those members who have not yet renewed. Since their memberships are still current and they still get a SPECTRUM newsletter, they should be counted. But the reality is that at some point in the near future, those members who do not renew must be dropped from the rolls, causing a rather sudden drop in the BAA's membership count. For example, as I'm writing this we have either 91 members or 126 members. Can you see my dilemma?

**If you haven't paid your 1997 membership dues, this is your last SPECTRUM.**

**Take a moment now to look at the mailing label on this issue of the Spectrum. If your name is followed by a (96), you need to renew NOW.** Your dues can be mailed to me at 125 Roycroft Blvd, Amherst NY 14226 or you may bring them to the next meeting. If everyone who hasn't renewed yet mails their dues to me or pays at the next meeting it would go a long way towards reducing my post-holiday blues. Of course, so would a couple of new eyepieces, a solar filter and a copy of Uranometria.

Speaking of membership, here is a list of the people who have joined the BAA in the last couple of months and have helped us reach our current total of 126 (or is it 91?) members:

|                           |                      |
|---------------------------|----------------------|
| Jeff & Janice Gardner     | Frank Pittman        |
| 3986 Tonawanda Creek Road | 197 Clearfield Drive |
| East Amherst, NY 14051    | Buffalo, NY 14221    |
| 639-0866                  | 688-4687             |

|                   |                     |
|-------------------|---------------------|
| Tom Mangione      | Gary Rotella        |
| 75 Wilbury Place  | 45 Rehm Road        |
| Buffalo, NY 14216 | Lancaster, NY 14086 |
| 873-2539          | 681-5535            |

Emilio Mastrandrea  
633 Linwood Ave.  
Buffalo, NY 14209  
881-2745

Please be sure to extend a warm BAA welcome to all of these new members when you meet them at the observatory or at our meetings.

Finally, a quick reminder that data for the BAA's Membership Directory will be compiled shortly. If you have a new telescope, a special area of interest, or an e-mail address you would like included in your listing, please let me know. I'll update your record and the information will get published in the 1997 directory.

**BAA ANNALS***Rowland A. Rupp*

**5 YEARS AGO** - We changed our venue for the January 1992 meeting to the Humboldt Room at the Museum of Science, the site of all our meetings until 1976. The reason was that Steve Kramer borrowed an astrolabe from the museum's collection and demonstrated it. An open question and answer session followed. Dave Fliss, Jack Mack, Dan Marcus and Joel Stuckey provided the answers. A planetarium show at Buffalo State by Art Geilow was our feature for February. Rather than having just a canned show, Art demonstrated the technical capabilities of the planetarium.

Dave Fliss wrote a SPECTRUM article on "The Eye and Astigmatism", in which he suggested some eye exercises that may reduce certain kinds of astigmatism. Ed Lindberg offered some sound advice about choices in eyepieces in his "Instrument Notes". Other articles included Trudie Brown's comments on observing during a trip to Germany and a note on the telescope building Clarks by Darwin Christy. There was also a suggestion by Tom Nigrelli that we start saving our pennies for a new 20-inch scope. You can see it at Beaver Meadow Observatory!

**10 YEARS AGO** - Ken Kimble spoke about the sun at the January 1987 meeting. In February we had a round table discussion on cosmology. Featured in the discussion were: Jack Mack, Rowland Rupp, Al Kolodziejczak and Ken Kimble, "if they are available". I guess I wasn't because I can't remember it.

Leslie Martin had an article in the SPECTRUM on the anthropic principle, a popular fad topic then. Leslie's article was somewhat tongue-in-cheek—it was entitled "I Don't Understand This". Edith Geiger had a profile on Jack Empson, then the BAA's Treasurer. Also included were a couple of Esther Goetz's astronomical poems and observation reports by Tristan DiLapo, Carl Milazzo and Michael Idem. The obituary for honorary member Octavia Black, written by Ed Lindberg, appeared too. Mrs. Black had frequently hosted star parties at her Camp Sprucelands, not far from the site of Beaver Meadow, long before we built the observatory.

**15 YEARS AGO** - Phil Cizdial, a BAA member and graduate student in astronomy, spoke on "The Mauna Kea Observatory" at our January 1982 meeting. He was studying at the University of Hawaii at the time. Fred Price spoke on "Mysterious Happenings on the Moon" in February.

Observatory Director John Riggs thanked Doris Koestler, Al Kolodziejczak, Carl Milazzo and Gene Witkowski for helping him add a cork lining to the 12-inch telescope to reduce dewing. Dennis Jewell was the topic of Edith Geiger's profile. She also reported in "Spy and Tell" that Darwin Christy had just retired from Niagara Mohawk after 28 years of service. Olga Lindberg provided an article for the SPECTRUM on the constellation Gemini. Carl Milazzo, Doris Koestler and Steve Desmond submitted observation reports, and Shaun Hardy reported on the NFCAAA meeting held in Rochester. Dr. David Meisel (our speaker just a month or two ago) was featured, speaking on "Moon, Meteors and Mosquitos".

**25 YEARS AGO** - Dr. Lyle Borst, BAA member and Professor of Physics and Astronomy at UB, spoke on "Prehistoric Astronomy" in January 1972. Next month, Darwin Christy and Ed Lindberg joined forces to present "Stellafane Pictorial". Darwin also had an in-depth article on "Polishing Laps" in the SPECTRUM. He identified some dozen, or so, different kinds of pitch laps and described their uses in polishing mirrors. Those who still make their own mirrors might want to read this article. John Riggs contributed a brief note on deep-sky observing in Aunga.

*(Continued on page 3)*

**Officers**

Bob Hughes - President  
Gene Witkowski - Vice President  
Lynn Sigurdson - Secretary  
Bev Orzechowski - Treasurer  
Dr. Jack Mack - Museum Representative

**Board members at large**

Joe Orzechowski - Bill Smith  
- Bob Titran  
Rowland Rupp - Fellow Representative  
Joe Orzechowski - Membership

**Observatory Directors**

Neil Dennis & Dave Fliss

**SPECTRUM STAFF**

Bill Smith - Editor / Layout  
Bev Orzechowski - Circulation

**BAA Annals continued from page 2**

**35 YEARS AGO** - Four talks were given at the January 1962 meeting at the Museum of Science. They were "Seeing" - Paul Redding, the solar system - Albert Hubert, astronomical anecdotes - Ron Clippinger, and Canis Major - Thomas Peltz. In February we saw a movie "The Universe" - in color! I guess "in color" was really something in 1962. Marjorie Meyerwill spoke on Gemini, Paul Redding "The Cluster of Planets" (a conjunction apparently) and finally, Lou Reinagle on "Dilute Stellar Radiation" to finish the program. Apparently we had more member participation in 1962. Might be a good idea!



**SPY AND TELL**

*Edith L. Geiger*

Congratulations to **Gene Witkowski** for being a 25-gallon blood donor through the Buffalo Regional Red Cross Blood Service. His picture appeared along with the announcement in The Buffalo News on December 11, 1996. Gene is a fine human being who willingly gives of himself to help others. What a splendid example! We're very proud of you, Gene.

**John Yerger** is a professional artist whose work is appreciated by a growing number of art galleries and individual collectors. He is with the Godel Gallery on Madison Avenue, New York City, which is permanently handling his pieces out west. They sold two of his paintings to Jami Gertz, star of the movie, *Twister*. John is also with the Red Piano Gallery in Hilton Head, South Carolina, and is preparing to do a show for them. The Copley Gallery in Boston is doing a small show of his works in May, a show by invitation only. He was published in the '96 fall issue of *American Art Review*, and has been contacted for an article for *Artist* magazine for May. Occasionally he exhibits his work locally at Rainbow Connection on Elmwood Avenue. He teaches painting at Partners in Art at 84 Main Street in Buffalo. He can be reached at his home, 833-8498. Best wishes for continued success.

**Rowland Rupp** will be teaching an Adult Education class at Amherst High School, January 16th, on Extraterrestrial Life. To enroll, call 836-3000.



**TREASURER'S NOTES**

*Bev Orzechowski*

**TWELVE MONTHS OF SPECTACULAR STELLAR IMAGES**

The all-new Exploring the Universe 1997 calendar features stunning photos and artwork and includes Images like the Mir space station in orbit above Earth, star trails over the inspiring nightscape of an Arizona desert, and the eerie green glow of an aurora in the Earth's atmosphere. An informative essay accompanying each photo explains the significance of the image. Each month also includes helpful information on viewing the numerous celestial events that occur throughout the year. And there's still plenty of room to note appointments and reminders.

Size: 13 1/2 x 10 1/2  
Photos: 13 Color  
Binding: Perfect-bound softcover  
Price: \$12.95

**Astronomy Group/Club Discounts**

\*Order 5 or more, take a 50% discount (unsold calendars are returnable)

\*Order 10 or more, take a 55% discount. (unsold calendars are not returnable at this discounted rate)

Everyone saves when we order together. Call Bev at 716-632-7091(day) or 716-839-9109 (eves). Please call by Jan 15th.



**THE UNIVERSE - A Unified Theory of Mass Energy Space Time Frame Mechanics**

SECOND INSTALLMENT, part 1 in Nov/Dec '96 SPECTRUM

**RELATIVITY - As Defined by the Modified Kepler Equation for Mass Energy Space Time**

**2. EQUILIBRIUM (continued) - Gravitational and Electromagnetic Fields, Gravity, Matter, and Antimatter.**

THE GRAVITATIONAL AND ELECTROMAGNETIC FIELDS obey the fundamental equation or law of the universe. However, the electromagnetic field is quite different from the gravitational field. The gravitational field is the relationship of mass accelerations and mass density. The electromagnetic field is the relationship between charge accelerations and relative charge density.

A CHARGE exists only when there is a displacement of the centers of positive and negative angular acceleration. The charge does not exist until the negative electron center of angular acceleration is displaced from the center of the positron or proton angular acceleration. When the electron is removed from the hydrogen atom, the hydrogen nucleus becomes charged positively relative to the electron and the electron becomes a negative charge. It is the distance between the centers of angular acceleration that creates the charge effect relative to the rest of the universe. Without this separation of centers the negative angular acceleration could not separately effect the rest of the universe. However, the center of angular acceleration of the orbital electron of the hydrogen atom is not the center of the proton although some of its angular acceleration is relative to that center. The change of electromagnetic energy of the rest of the universe, the photon, is related to a change of the distance between the centers of the positive and negative charges, as well as the size of the charges or the densities of the values of  $m$  and  $M$  as expressed by the fundamental equation, because in the electromagnetic field this defines relative angular acceleration of charge or time  $t$  in terms of the relative densities of charges.

THE ELECTROMAGNETIC FIELD is primarily the result of a change of the relationship of the negative volumetric and angular accelerations of charges relative to the rest of the universe. The negative electron angular accelerations are much less dense than the positive proton or positron angular accelerations because the protons are in the nucleus of the atom and are much more dense. The positive angular accelerations are associated with the nucleus almost exclusively. Their effective relative universe is the nucleus of the atom much as the earth's effective center of the universe is the sun. The orbital electron angular accelerations are associated with the rest of the universe outside of the nucleus, almost exclusively, and for this reason they dominate in the formation of the

(Continued on page 5)

**SPECTRUM DEADLINE**

The deadline for the Mar-Apr issue is

**Feb 14th.**

Send all submissions to Bev Orzechowski  
125 Roycroft Blvd., Buffalo, NY, 14226.

Preferred format is typed or PC readable WordPerfect for DOS 5.1 or earlier, MS Word for DOS or ASCII.

-- scanning available --

Handwritten or other formats are fine too -- we really like submissions!



## ASTRONOMICAL HAPPENINGS

## TIME WELL SPENT IN ASTRONOMY

## Moon

| Last Qtr | New   | 1st Qtr | Full   | Last Qtr. | New   | 1st Qtr | Full   | Last Qtr. |
|----------|-------|---------|--------|-----------|-------|---------|--------|-----------|
| Jan 1    | Jan 8 | Jan 15  | Jan 23 | Jan 31    | Feb 7 | Feb 14  | Feb 22 | Mar 2     |

NOTE After midnight events are listed for the proper day! Thus 1 am on the 10th means you must be prepared be up late on the evening of the 9th.

## CELESTIAL DELIGHTS

This section normally comes from our public naked-eye event handout, "Celestial Delights". No one answered the call in the last SPECTRUM to prepare the 1997 version. One is still needed for the upcoming public season. Details are on page 9. This is a nice project for all you PC and Mac owners out there to exercise those planetarium programs!

## YEARLY SKY GUIDES

Sky & Telescope came out with a yearly guide (Sky Watch '97) similar to Astronomy magazine's (Explore the Universe 1997). Astronomy's is preferred for a 'sky guide'. Both are so comprehensive that either one should be considered to be a 'must-have'. They, however, DO NOT show enough planetary combinations and close approaches of objects. Several are listed to the right. Nonetheless if you don't have one of these guides ... what are you waiting for? Visual astronomy is difficult enough; more so without one of these guides.

## Mercury, Hale-Bopp and Mir spotted

The 2 days after the December meeting were actually clear for awhile! Mercury, Jupiter, the moon and Saturn could be seen forming a string defining the ecliptic. Comet Hale-Bopp was readily swept up in 10x50 binos, down toward the horizon and showed a really nice tail! While Tom Bemus and I were looking around, space station Mir crossed parallel to the northern horizon, outshining Jupiter.

Winter weather has some clear patches to take advantage of. Also binos are all you need to do some quick observing. Even 15 minutes outdoors with naked-eye

Bill Smith

| Date      | Event, elevation above noted horizon @ time listed [binos or small scope helpful]             |
|-----------|---|
| Jan 7     | Very thin moon 4° above bright Venus, 10° above SE @ 7:00 AM                                  |
| Jan 8-29  | Mercury approaches Mars & passes it on the 11th, 5°-10° above SE @ 7:00 AM                    |
| Jan 10    | Thin moon 2.5° left of M72, M73 and Saturn nebula, 12° above SW @ 6 pm                        |
| Jan 13    | Almost 1st qtr moon 3° right of Saturn, 43° above SSW @ 6 pm                                  |
| Jan 16    | Globular M22 0.5° below bright Venus, 5° above SE @ 7:10 AM                                   |
| Jan 18    | Gibbous Moon in Hyades, occultation of Aldebaran @ 1am (morning of 19th)                      |
| Jan 21-24 | Globular M22 may be spotted 2° right of Mercury, 5°-10° above SE @ 7:00 AM                    |
| Jan 28    | Can you spot 11th mag galaxy NGC 4030 near dark edge of gibbous moon, 4:00 AM                 |
| Jan 28-29 | Gibbous moon near Mars in Virgo   |
| Feb 3     | Globulars M9 & NGC 6356 2.5° left of thin moon, 20° above SE @ 6 AM                           |
| Feb 4     | Thin moon in 'steam' of Milky Way coming out of the teapot, 15° above SE @ 6:15 AM            |
| Feb 5-6   | Spot dimmer Jupiter within 1.5° of Venus, 2.5° above SSE @ 7:10 AM, 5° at sunrise             |
| Feb 10    | Almost 1st qtr moon 4° above Saturn, 30° above SW @ 6:30 pm                                   |
| Feb 11    | Jupiter left of Mercury, <u>very low</u> , 5° above SSW @ 6:30 AM (1/2 hr before sunrise)     |
| Feb 17-23 | Uranus within 1° of Jupiter, <u>very low</u> , 5° above SSE @ 6:30 AM (1/2 hr before sunrise) |
| Mar 6     | Thin moon 4° above Jupiter, 10° above SE @ 6:10 AM (1/2 hr before sunrise)                    |

**For Sale:** Dick Zygmunt, a former BAA member, is offering the following items for sale. Negotiable prices @ inspection. Dick Zygmunt, 2371 2nd Street, Grand Island, NY 14072, 773-1645

1. Refractor telescope, 4" f/15, Jaegers color corrected achromat primary with dew cap, wooden carrying case and 2" Unitron guide scope. The telescope is mounted on a rigid 5 ft. tripod and latitude-adjustable, equatorial mount with 5" setting circles. Also 4 eyepieces adapted to 1.25", adjustable 2x-3x Barlow lens, 90° diagonal prism, filar micrometer w/eyepiece and a spotting scope w/erecting eyepiece and 1.25" adapter.
2. Jaegers achromatic objective lens 6" f/15.
3. Assorted mirrors, prisms, optics **CALL!**

## BEAVER MEADOW OBSERVATORY 457-3104

First, I'd like to extend to Dan Marcus and Bob Titran very many thanks for Beaver Meadows' smooth operation over these many years. Dan's dedication and Bob's co-directorship will be very hard to follow. On behalf of the BAA, Neil and myself, hats off to them.

The observatory will remain open for Public Night on the first and third Saturdays of each month rain or shine starting in April. Neil and I will try to come up to the high standards set by our predecessors, but as we know it takes many of us to run successful Observatory events. Also, the more the merrier! We still will need a lot of help with lectures, members to run the scopes, bring their own equipment (read toys) and of course answer questions. We would also appreciate any suggestions concerning the observatory and its operation.

I personally feel that we perform a unique function for the public in bringing an outlook to the world in which we live that may not be available anywhere else. Reading astronomy books gives us the knowledge we need, but an actual observing experience is what welds mind, eye and

imagination together. You don't have to be a fountain of knowledge to join us out at Beaver Meadow. What actually fires the imagination of the public is your enthusiasm. That's what gets people excited. Even if you're just learning your way around a telescope and the sky, your trials, tribulations and gnashing of teeth can inspire others as well as your successes.

Since we now have a VCR and TV at the observatory, if any member has any astronomical video tapes that we could play during public nights, between or with a lecture, or on cloudy nights please let me know. Copies can be made so that your original can be returned to you.

**Observatory combination changed. Call Dave Fliss at 688-6969 for info and new combination.**

Just a reminder. The combination to the observatory has been changed. You can call me at 688-6969 for the new combination if you have been checked out on observatory procedures and are a dues paid member.

Dave Fliss



The Universe ... continued from page 3

attractive and repulsive magnetic effects of the electromagnetic field outside of the nucleus. The gravitational field lacks this positive and negative charge nature because it is related to the volumetric and angular acceleration of energy density, effectively, in the absence of the displacement of the charges. The electromagnetic charge effect on the universe outside of the nucleus is therefore much more easily observed than the gravitational effect and is assumed to be stronger. Negative angular accelerations inside the nucleus have no charge displacement relative to the nucleus and changes of their relative volume do not appreciably change the magnetic and electromagnetic effect on the universe outside of the nucleus.

TIME AND DISTANCE are relative quantities. They exist only because of their relationship to relative masses and charges expressed in the fundamental equation. Angular acceleration  $1/t^2$ , where  $t$  is the period of the earth  $m$  rotation about the sun  $M$  (or the effective center of the rest of the universe) is expressed by the fundamental equation  $1/t^2 = KM/L^3 - Km/L^3$ . Relative angular acceleration is a function of the difference of the densities of the quantities  $m$  and  $M$ .  $M$  and  $m$  are neither mass nor charge. They are energy constants related to a particular equilibrium condition. These constants change as the relative volumetric acceleration changes. Mass and kinetic energy are expressed by the equation  $mL^2/t^2$  consistent with the fundamental equation. VELOCITY is the relationship of distance/time. Where the total universe  $M$  is expanding with time relative to  $m$ , the values of distance and velocity cannot be defined in the absence of  $m$ . In the presence of  $m$  and mass  $mL^2/t^2$ , the value of velocity must change as the universe expands relative to  $m$ . A change of distance at the same rate as time or constant velocity would then be possible only in an equilibrium system. However, we are assuming that the value of  $M$ , and total energy of the universe, is expanding with time relative to  $m$  and that the value of potential energy must be decreasing relative to  $m$ . The value of kinetic energy must be increasing with time, if the total energy is to remain a constant. The value of velocity must therefore be continually changing with time. A state of acceleration must exist. ACCELERATION such as that of the universe can exist only by comparison, which is fixed by the relative values of  $m$  and  $M$ . This is expressed by the fundamental equation of the universe:  $mL^3/t^2 = K(M-m)m$ . This is the equation for constant total energy. For the constants  $m$  and  $M$  to exist, the state of acceleration equilibrium expressed by the fundamental equation must exist.

### 3. Particle and Anti-Particle - Electron and Positron

If the anti-particle and particle are oriented so as to spin in the same direction or sense, the magnetic field of one is reversed with respect to the other. The magnetic field of the electromagnetic field is assumed to be the volumetric acceleration difference relative to the rest of the universe and this is related to angular acceleration of charge according to the fundamental equation. A change of the negative counterclockwise rotation and negative charge of the electron relative to the rest of the universe would be a volumetric acceleration and a magnetic field relative to the rest of the universe. According to the fundamental equation, any increase of relative angular acceleration is also a decrease of relative volumetric acceleration compared with the rest of the universe. This would be interpreted as a force of magnetic attraction if the centers of positive and negative angular acceleration were not the same center. This explains why the proton is stable. Static charge and magnetic forces do not exist within the proton. If two hydrogen atoms are viewed as having a counterclockwise spinning spherical electron negative charge about the proton, the north magnetic pole fields would be on top. The volumetric acceleration relative to the rest of the universe would be decreased by the approach of the north pole of one of the atoms to the south pole of the other, and they would appear to attract one another relative to the rest of the universe which would be accelerating volumetrically at a greater rate, because of its relatively lower density. Assuming that the positron and electron are spinning spherical charges, they would be expected to be spinning in the opposite sense and their centers of spinning energy, or angular acceleration, can not be the same center. For the positron, the positive charge, spinning counterclockwise, would have its south pole on

top. The approach of the positron north pole to the electron south pole would reduce the density of angular acceleration or cancel angular acceleration relative to the rest of the universe and the energy of the pair would increase in volumetric acceleration or expand more rapidly. If the angular acceleration was completely cancelled the energy would expand at the speed of light as does the energy of the rest of the universe in the absence of mass angular acceleration of inertia. A high energy gamma ray photon would be generated. Magnetic attraction would be absent. However, in the presence of a proton mass density, the positron-electron pair would be more stable because the volumetrically accelerated expansion of energy would be very low at the higher energy density. Because all changes are relative, and this change would be mostly relative to the proton, the apparent relative change could be negligible when viewed from the outside of the proton. The proton would appear to be very stable. Time and apparent stability of matter are relative quantities which obey the fundamental equation.

### 4. Angular and Linear Kinetic Energy, Angular Momentum and Energy Transfer

Linear and angular kinetic energies are the same only when the angular distance that the rotating energy  $m$  travels in time  $t$  is  $2(\pi)r$  and the effective radius  $r$  of curvature of the rotating mass times  $2(\pi)$  also equals the linear distance  $L$  travelled by the mass  $m$  in the same time  $t$ . The effective  $2(\pi)r = L$ . The distance of the energy  $m$  from the center of curvature is important to angular kinetic energy but not to linear kinetic energy.

Only when the angular momentum of the electron  $m$  equals the linear momentum can a negative angular energy change of the electron relative to the rest of the universe equal a positive potential energy change, a PHOTON, of the electron relative to the rest of the universe. Wherever mass  $m$  is used relative  $mL^2/t^2$  is inferred. Only when the effective radius of curvature  $r$  of the motion of the electron mass  $m$  is such that  $2(\pi)r = L$  and the angular momentum of the electron,  $2(\pi)rm/t$ , equals the linear momentum  $mv = mL/t$ , will a PHOTON energy change of the universe relative to the electron equal a negative angular energy change of the electron  $m$  relative to the rest of the universe  $M-m$  and a photon energy transfer can take place. This also indicates why the energy change must take place in quantum increments  $h/t$ . The relative time and density relationship expressed in the fundamental equation of the universe must apply. For this reason, the distance of the electron from the center of the atom is specifically important to the frequency and size of the photon energy transfer.

Allen C. Goodrich  
Copyright 1996, Allen C. Goodrich

[This second installment concludes Mr. Goodrich's article submitted to the SPECTRUM. His first installment has inspired Rowland Rupp's article "THERE IS A TIDE", following, and Joe Orzechowski's article "COMMENTS ON 'THE UNIVERSE - A Unified Theory'", both contained elsewhere in this issue. We look forward to future reviews of this second installment.]  
- Editorial Staff

## THERE IS A TIDE

We have a new club member, Allen C. Goodrich, who has written an interesting article for the November-December 1996 SPECTRUM on a new theory of the universe. Welcome to the club!

I must admit I found his math daunting (remember—I'm the guy who proved that two equals one in that same SPECTRUM.) But I did take an interest in the problem cited about the tides. Mr. Goodrich pointed out that one learns from the dictionary or the encyclopedia that high tide occurs under the full moon in accordance with gravitational theory. He noted that in reality it is quite the opposite: low tide occurs under the full moon, while high tide occurs at right angles to it—presumably at a point near the equator where the moon is seen to be either rising or setting. Hence gravitational theory cannot account for tides, and a new theory is in order.

(Continued on page 6)

There is a tide continued from page 4

I must admit this bothered me some because I had a recollection about the tides being caused by gravitational effects, and, surprisingly, actually occurring *in advance* of the moon's passage of the meridian. So I decided to consult the dictionary and encyclopedia, as Mr. Goodrich did, to find out first hand what they had to say. Speaking for myself, these would not be my first choice of references to learn about tides although, I suppose, the latter ought to say something informative about the subject.

My dictionary (Random House) was pretty non-committal. In essence it said tides repeat at roughly twelve hour intervals and are caused by the attraction of the moon and sun. It didn't say anything about the position of the moon at the time of high tide, and it didn't say what kind of attraction either. Funk and Wagnalls' encyclopedia (1947) said that tides are caused by gravity, and added "high-water at any place occurs on the average a definite interval *after* the meridian passage of the moon". Not a very helpful comment for my idea that the tides lead the moon. Not very helpful for Mr. Goodrich's theory either, unless this "interval" turns out to be six hours.

Since my dictionary and encyclopedia didn't tell me quite what they were expected to, I decided to try some other sources. I decided to work my way up; maybe the idea of how tides work has changed with time.

My first reference was Cavallo's *Philosophy*, circa 1809. (Well, what would you expect of someone with a fifty year old encyclopedia?) The "attraction" of the moon is the contributing factor, it said. Is this "attraction" gravity or, possibly, the effect of Mr. Goodrich's "Fundamental Equation"? Later, Cavallo spoke of the attraction being proportional to the inverse of the squares of the distance. Sounds like gravity. He goes on to say that the tidal bulge is directed toward the moon, but then points out that high tide is actually *delayed* from the moon's passage because it takes time for the "attraction" to build up the water. No mention, however, of this delay approaching six hours.

I decided to surge ahead to see what Simon Newcomb had to say about tides in 1878. After all, he was Superintendent of the Nautical Almanac Office, and if anybody should know about tides, they should. Well! Newcomb said that gravity is the cause, and then explained the dynamics in terms of earth's "centrifugal force" around the earth-moon barycenter. Moreover, the inertia of the water causes high tide to be delayed for "some hours after the moon had passed the meridian". Could it be six hours? No, worse than that, depending on the configuration of islands and continents, it could be a *whole day*!

Onward. David Todd's *New Astronomy* (1906) attributed tides to gravity. He also noted that inertia causes the tide to be delayed. The delay at each port is different, depending in a complex way on the configuration of ocean beds and land masses. He stated that the tide at New York City is delayed by 8.5 hours, even more than the 6 hours suggested in Mr. Goodrich's article. Where does this put us? Since the interval between high tides is almost 13 hours, it's hard to say if the tide at New York is retarded by 8.5 hours or advanced by 4.5 hours. And if, as Newcomb says, the tide can be delayed a whole day we're in even worse shape. At this rate everybody is going to be right. At least nobody will be unhappy.

Finally I consulted two college level text books, both dated 1994. One, *Astronomy*, was written by William K. Hartmann and Chris Impey; the other was William J. Kaufmann's *Universe*. Since the explanations given in both are practically identical, I'll summarize them jointly. They assert high tides occur on approximately opposite sides of the earth and are caused by the gravitational attraction of the moon, and to a lesser degree of the sun. Both have sketches showing the earth with two tidal bulges on opposite sides. (Astronomy text books tend to say the same things and contain the same illustrations these days.) The bulges are shown leading the position of the moon in its path of revolution around the earth. They both allege that because the earth rotates faster than the moon revolves, high tide is carried along in advance of the moon's position in the sky.

That's what I thought I remembered. One wonders what it proves. That the tides and the moon's position don't coincide is agreed by all. Older texts say gravity is the cause and the tides are delayed due to inertia. Newer texts also say gravity is the culprit, but the earth's rotation advances the tides. Goodrich says it's not gravity at all, it's the conservation of total energy as formulated by the Fundamental Equation, and the tides are right where they're supposed to be. But on one point all are in accord, everyone blames the moon.

Rowland A. Rupp

## COMMENTS ON "THE UNIVERSE - A Unified Theory"

The first installment of an article titled "The Universe - A Unified Theory of Mass Energy Space Time Frame Mechanics" by Allen C. Goodrich, which appeared in the last issue of the SPECTRUM, was one of the most thought provoking articles I have seen in the SPECTRUM in a long time. It's the first article I've ever read more than once (other than my own). In fact, I actually read it several times to try to gain a better understanding of the principles being presented by the author. One of the difficulties I had with the article was that it was often not clear to me what the symbols used in the equations meant. However, after a few passes through the article I think I finally managed to get a handle on the equations.

Having said all that, I do have three questions to pose to the author. First, at the beginning of Section 2 of the article the author states that "kinetic energy is the angular acceleration of inertia." If this statement were true, wouldn't it imply that an object moving in an orbit at a constant angular velocity (no matter how fast) with an angular acceleration of zero would have a kinetic energy of zero? Isn't kinetic energy related to the velocity of a mass and not its acceleration?

My second question deals with the the author's fundamental equation of the universe. Mr. Goodrich clearly states that the kinetic energy of a mass is  $mL^2/t^2$  but does not make as clear a statement about the potential energy. From the equation for changes in these two energies (the "delta" equation) it appears that the potential energy of a mass is defined as  $K(M-m)(m)/L$ . If this is true, the "delta" equation relating the changes in kinetic and potential energy would seem correct, but then wouldn't the author's fundamental equation of the universe seem to say that for any mass or system in equilibrium, the kinetic and potential energies must be equal? According to the author, "The fundamental equation of the universe is an expression of constant total energy of the universe." Perhaps, then, the fundamental equation may be more correctly stated as:

$$mL^2/t^2 + K(M-m)(m)/L = C \text{ (a constant)}$$

This equation means that the sum of the kinetic energy and the potential energy at equilibrium remains constant. Of course, this form of the equation significantly changes the results of Mr. Goodrich's subsequent derivations.

Finally, if the author's potential energy is expressed as  $K(M-m)(m)/L$  then I assume that L is the distance between m and (M-m). I am basing this assumption on the fact that his expression for potential energy appears very much like the expression for the potential energy of an object being acted on by a central force obeying the  $1/r^2$  law (e.g. gravitation). My question is this: Since m is completely surrounded by the rest of the universe (M-m), how is the distance L defined?

Perhaps I have given Mr. Goodrich something to think about or perhaps I have completely missed the point of his article. In any event, I thoroughly enjoyed the mental challenges presented by this article; it forced me to go back to some of my old physics texts to refresh the old grey matter.

I am looking forward to reading the next installment of Mr. Goodrich's article in the January-February 96 issue of the SPECTRUM.

Joe Orzechowski

## Ever Wonder Why: Fewer satellites are seen in winter?

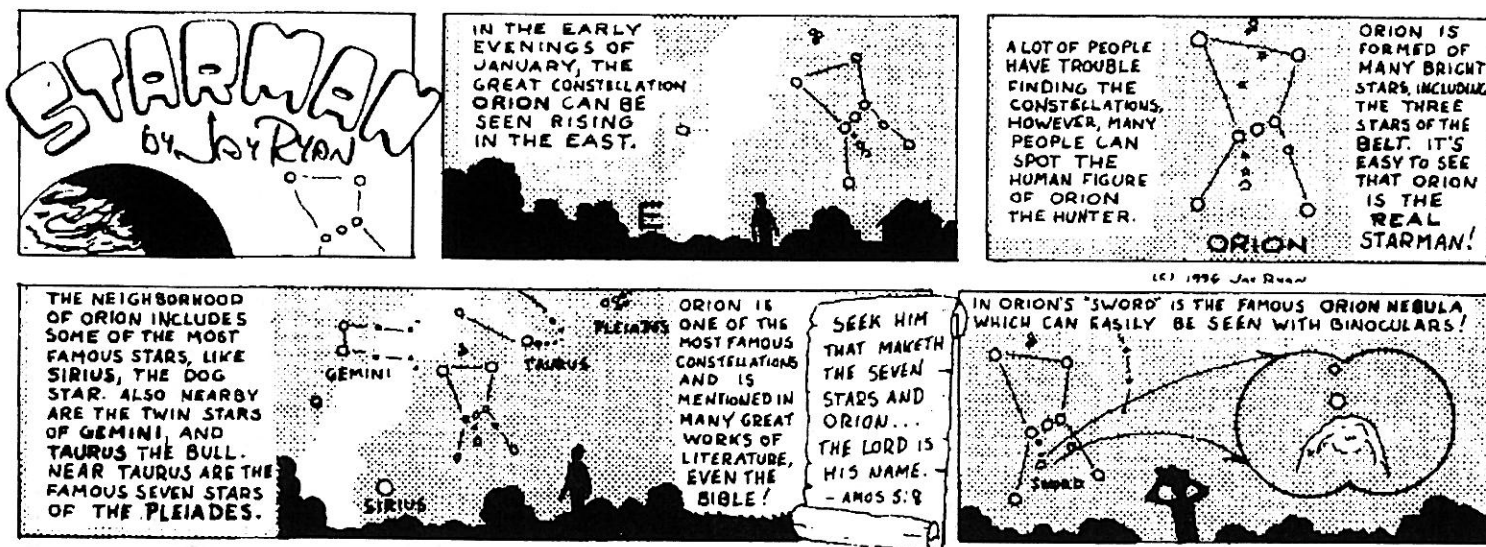
September through April are poorer months for seeing satellites than May through August. It does not have to do with the clouds but rather the fact that the shadow cast by the Earth blocks sunlight from striking the satellites. Only those satellites in near-earth orbit can be seen at all with the naked-eye. Satellites must reflect the sun's light to be seen. In winter the overhead sky quickly plunges into shadow after sunset. In summer the earth's shadow is more toward the south and even at midnight the earth's shadow is not overhead. Use a textbook or solar system simulation program to check it out yourself.

Bill Smith

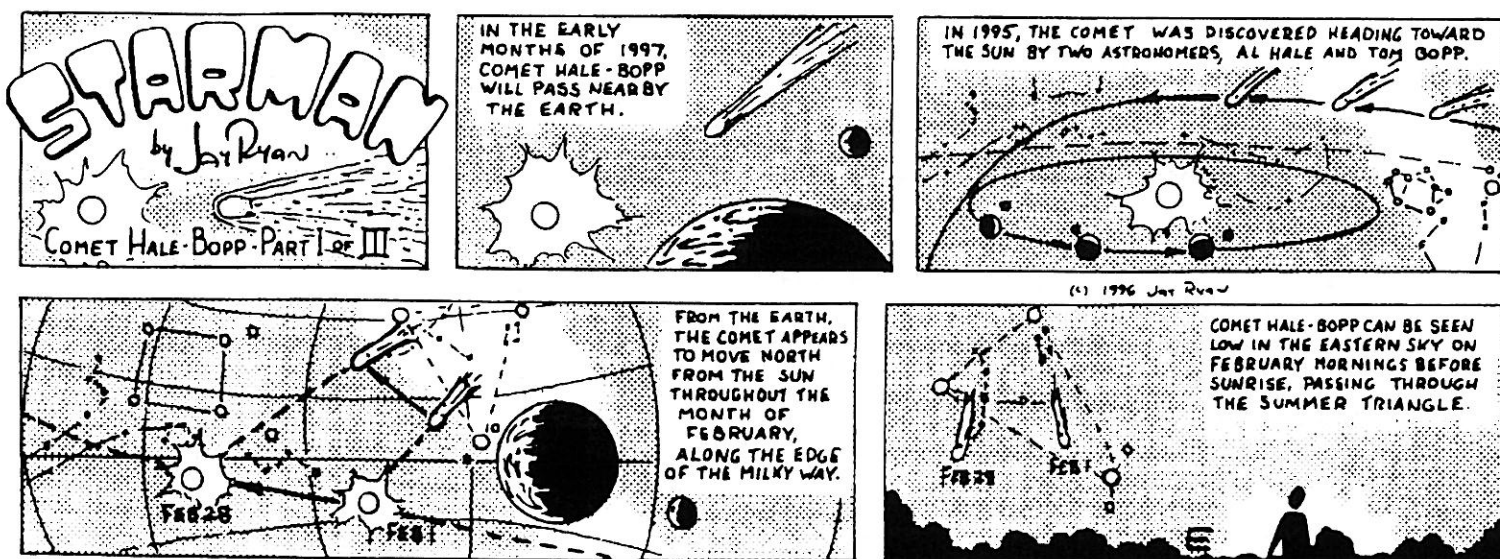


The following 'educomics' are supplied by Jay & Debbie Ryan, two amateur astronomers from Cleveland, Ohio.

## For January



## For February



## POETRY CORNER:

### STARS

As if with keenness for our fate,  
Our faltering few steps on  
To white rest, and a place to rest  
Invisible at dawn —

And yet with neither love nor hate  
Those stars like some snow-white  
Minerva's snow-white marble eyes  
Without the gift of sight.

— from *Stars* by Robert Frost

## ERRATA

Two equations in the article "TWO PLUS TWO EQUALS ONE" authored by Rowland A. Rupp were incorrectly printed in the NOV/DEC 1996 issue of the SPECTRUM. The correct series of equations are printed here; those that were erroneous are marked with an asterisk:

Start by setting X equal to one:  $X = 1$   
Then multiply both sides of the equation by X:  $X^2 = X$   
Next, subtract one from both sides:  $X^2 - 1 = X - 1$   
Factor the left side:  $(X + 1)(X - 1) = X - 1$   
Now, divide both sides by the factor (X-1):  $(X + 1)(X - 1)/(X - 1) = (X - 1)/(X - 1)$   
Or:  $X + 1 = 1$

Sorry about that Rowland!

Rowland reports receiving comments about the misprint and also a suggestion that the article should be entitled "TWO EQUALS ONE".

Personally, I think the article should be entitled "ZERO EQUALS ONE" or maybe "INFINITY EQUALS ONE".

Bev Orzechowski



## IN MEMORIUM

### Walter J. Semerau

It is with great sadness that we announce the passing on November 3, 1996, of longtime, deeply respected member, Walter Semerau. He was held in high esteem by both amateur and professional astronomers, friends and associates for his creative genius. With all his remarkable ability he was a man of utmost humility. It is difficult to condense into a few words the events of his outstanding life.

Walter was born in Hermantown, Pennsylvania, of German immigrants. The family moved to Layland, West Virginia, where his father worked as a contractor in a coal mine, and then on to the mining town of Eccles, West Virginia. After his mother became a widow, she moved her family of two girls and three boys to Ethel, West Virginia, supporting them by running a boarding house for the employees of the Cleveland Cliff Iron Company.

When Walter was in 9th grade, his mother lost her job, so Walter became the bread-winner, working in the mines until he was 17 years old. He decided to try his luck in California and made two trips lasting 1 1/2 to 2 years, and worked at anything he could find to earn a dollar. He became an electrical contractor, wiring cabins and a school building; a night watchman in a school; and a life guard.

Then came the day that Roosevelt closed the banks. Walter headed back to "West Virginny" and returned to the darkness of the mines as an electrician for the next four years. In 1936, he found work in his home town as an electrician with the Electro-Metallurgical Company, a subdivision of Union Carbide.

One day when Walter saw the richest boy in town spinning a padlock, he figured a way to have the boy give him that padlock as he just had to find out the workings of that lock. He took the lock home and pulled it apart, and from then on he found a way to make keys for any lock, anywhere, using a five dollar key filing jig. He was a sensation as people gathered to watch him make keys. He was the original key maker, and a real safe "slicker" who could open any lock, given the time. Walter always notified the police when he was called upon to crack a safe so he would always be cleared of any felony.

The money he earned as a safe cracker and key maker was used for courtin' money when sweet Becky came along. After a couple years, they were married to live happily ever after. They had three children, Walter Jr., George, and an artistic Mona ("Penny").

While Walter was at the Electro-Metallurgical Company, he wanted a camera that had all the best qualities of the best cameras on the market, so he just up and made one, with all adjustments, rotating back and built-in couple-range finder, all handmade except for the lens and bellows.

During the war the Agfa Corporation in Binghamton published a notice that it couldn't help the amateur at that time, but would when the war was over. Walter sent a snapshot of his camera to the company, and they were very impressed, and asked Walter to bring his camera to the company, and they would pay his wages while there. The company took out a patent on the range finder in his name.

The old company changed its name so there was an old and new company and they both wanted Walter, but he decided to stay with Electro-Metallurgical. A battle ensued with the two companies over the camera. Walter got his camera back, promising never to change the shape of that camera. General Aniline Film Corporation bought out Walter's patent rights. The company offered him the title of Optical Engineer if he would stay with the company, but he decided to stay with Electro-Metallurgical.

In 1948, the company had a company-wide fair, where one could enter anything one chose. Walter entered his camera and a telescope, and his camera won the competition with its \$40 prize, with which he bought more tools.

That day a company official was in town, staying at a hotel across

the street. He wandered over and looked at the entries. He liked Walter's fine camera and said, "That fellow deserves a break!" and sent a delegate to ask him if he would consider living someplace else, to which Walter said "no" as his roots were in West Virginia. Becky urged him to say "yes" if he was approached again and see what they offered. Lo and behold, a second fellow came from the company and asked him the same question. This time Walter said "yes." The general manager called him into the office and also told him he deserved a break, then sent him to work at the Linde Division of Union Carbide in the Town of Tonawanda in 1948. He was hired as an engineer, complete with an official diploma.

At Linde, Walter designed and made all kinds of instruments. He also built equipment that other people used in their research. He designed machinery used in work for the biological laboratory, environmental space systems, deep sea diving systems, brain wave studies using rats, and worked in the gas separation department where oxygen was taken out of the air and salt out of sea water.

Dr. O'Brien, a professor at the University of Rochester, was a consultant for Linde. Linde sent Walter to the university to study high speed photography with Dr. O'Brien. He recommended that Walter make the first schlieren mirror for Linde. O'Brien designed a high speed rotating mirror camera and Walter made it. It was used to photograph exploding wires, but was used later as a thermometer to measure temperatures of high speed. Walter made two of these rotating mirror cameras. He also made a Raman spectrograph which was shipped to Forest Hills. He learned about the Ebert spectrograph from O'Brien, and made two spectrographs which were at Linde, and he took the best features of these and used them in his own Ebert-type solar spectrograph.

In 1943, when Walter's eldest son, Walter Jr., was 7 years old, he became very interested in the sky. Walter bought him the book, *A Dipper Full of Stars*, which they read and enjoyed. Walter decided to make his son a telescope. As years went by, his son's interest in the sky waned and Walter's interest increased, with telescope building and celestial photography becoming a hobby, and the sky a great love.

In 1954 the bright lights of the newly built Sheridan Plaza caused Walter to give up night observations and switch to the day sky, concentrating on the Sun. He enjoyed the challenge that solar astronomy offered in instrument making. His solar observatory was one of the most outstanding privately owned facility of its kind in the world. His heliostat, which picked up the Sun's image, was mounted on a metal tripod 14 feet high at the back of his house. The Sun's image was piped into the basement where he could conduct all his observations in comfort, without worrying about the temperatures outside.

Another outstanding piece of equipment which Walter made was a spectroheliograph-spectroheliograph combination, worth many thousands of dollars. This instrument separates the Sun's light into a spectrum, into many shades of basic colors, each representing radiation from some element. By tuning it, Walter could select any given color and scan the Sun in the light of that color, either visually or photographically. He also built a quartz monochromator which uses the red light of the hydrogen atom to reveal solar prominences at the Sun's limb. With an automatic time-lapse camera attached to this filter, he took many exceptional movies of the Sun in action.

Walter didn't keep his astronomical talents to himself. He donated his time and talents to build a solar spectrograph and spectroheliograph for the then new solar observatory at the Buffalo Museum of Science. He became a Research Associate of the Kellogg Observatory and was elected a Benefactor of the Buffalo Society of Natural Sciences in recognition of his generosity.

In Walter's basement he had a complete machine shop and also a lens-making shop, and made all his precision instruments with war surplus parts and scrap metal. He built or re-built numerous hand tools, a drill press, a lathe, a diamond saw, a vacuum chamber for

(Continued on page 9)

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## Total Lunar Eclipse Seen

The total lunar eclipse of September 27th 1996 should have been visible in Buffalo skies during the middle and late evening of that day but for clouds, as Gene Witkowski subsequently told me in a phone call. Fortunately, I was able to view the entire umbral phase of the eclipse under very good conditions from my home in England, just west of London, but it cost me a night's sleep!

The sky of the early and later evening of Sep. 26 had a complete cloud ceiling and I almost gave up hope of seeing the eclipse which was due to start in the early morning hours of the 27th. However, well before the umbral stage was due to start, the clouds began dispersing and I viewed the umbral stages of the eclipse in virtually perfect seeing conditions. I watched it intermittently with an altazimuth mounted Celestron short focus 3" refractor under low power.

Sept. 27th 02:04 BST: a faint duskiness was seen at the Moon's west limb. The umbral phase commenced at 02:12, the Earth's umbra 'biting' into the Moon's west limb.

As the shadow advanced across the lunar disc, a faint coppery hue was seen in the shadowed areas but the edge of the shadow was grey. The maria were faintly visible in the shadow.

Totality commenced at 03:20. At mid-eclipse (03:53) the north and west limbs were bright and whitish in color. Maria were clearly visible in the darker parts of the disc which were of a distinct coppery hue,

especially to naked-eye viewing. This could be described as a bright eclipse and I ranked it 3 or better on the Danjon scale (0=darkest to 4 brightest).

Totality ended at 04:29. The retreating edge of the umbra passed through Mare Nectaris and Mare Crisium at 05:25 and the umbral phase ended at 05:36. A faint trace of shading was still visible at the south-east limb at 05:40.

## ... and a Partial Solar Eclipse!

Two weeks after the total lunar eclipse of Sep. 27th, there was a partial solar eclipse visible from England, on Oct. 12th, the second one this year. On that day I had arranged to visit friends in Bognor Regis, a seaside resort on the south coast of England. Clouds interfered somewhat with viewing the eclipse but on the whole it was well seen throughout. Occasionally the eclipse could be viewed through thin cloud. We watched it under low power with a 3" Celestron refractor with a full aperture reflective solar filter.

The eclipse commenced at 13:59 BST. The Moon traversed the northern part of the solar disc moving from west to east. At mid-eclipse about 61% of the sun was covered; the greatest coverage seen from England since 1961.

A total eclipse may be seen in England on Nov 11, 1999. Make your reservations early!

Fred W. Price

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