



Roanoke Valley Astronomical Society

Amateur Astronomy News and Views
In Southwestern Virginia



Volume 29—Number 2

February 2012

January looks ahead

By John Jardine Goss

The January RVAS meeting offered members observing reports and challenges, a Litel update, a demonstration on mirror cleaning, and to top it all off, a delicious Milky Way bar.



RVAS members at January meeting
Photos By Michael R Good

Litel Scope

The Society's library telescope project made progress. It was ordered and received. The optics were tested by observing the moon, Jupiter, M42, and M35. The images were



RVAS VP John Goss gives talk on the Litel scope

(Meeting Continued on page 2)

excellent. It proved to be the "little scope that could."

Volunteers are needed to help make the project a success. Modifications must still be made to the scope to make its optical train more inaccessible to inquisitive, but unauthorized fingers. Rand Bowden volunteered to assist with the design of the promotional display and Rick Rader has offered to help get the display constructed.

Suggestions for a different name of the project are being accepted.

Observing Reports

Earlier in the month, Michael Good issued an observing challenge for members to observe deep sky object in either Pisces or Camelopardalis. Genevieve Goss reported her experience:

"I followed Michael's challenge and viewed Camelopardalis with my Nikon 10 x 50 binoculars. Although the constellation is tricky to find in winter, I was rewarded with a good look at the asterism Kemble's Cascade."

Then, Genevieve issued her own challenge:

Attend ALCon in Chicago!

Chicago is about 12 hours from Roanoke by car, 18 hours via Amtrak from Clifton Forge

and 1 h 49 min by nonstop flight from the Roanoke Airport on United.

Chicago is frequently ranked as a top vacation destination.

Chicago is home to the Adler planetarium, the first planetarium built in the western hemisphere and the oldest in the existence today. The Adler has replaced its 40-year-old Zeiss projector with a Global Immersion Digital Starball system to provide an experience the closest to actually being in space.

- Chicago is also the home of the nation's oldest continuously active astronomy club, the Chicago Astronomical Society, the host of this year's ALCon, the annual national convention of the Astronomical League to be held around the 4th of July. Start making your vacation plans, find a travel buddy for carpooling and plan to attend ALCon 2012!!

Details can be found at www.ALCon2012.astroleague.org

Light Pollution Video:

The view from the ISS as it traveled over the US was shown in the video:

<http://www.youtube.com/watch?v=QFL8B2KaQio>

Mirror Cleaning Demonstration

John Goss brought an 8 inch mirror for cleaning. The procedure that he followed was:

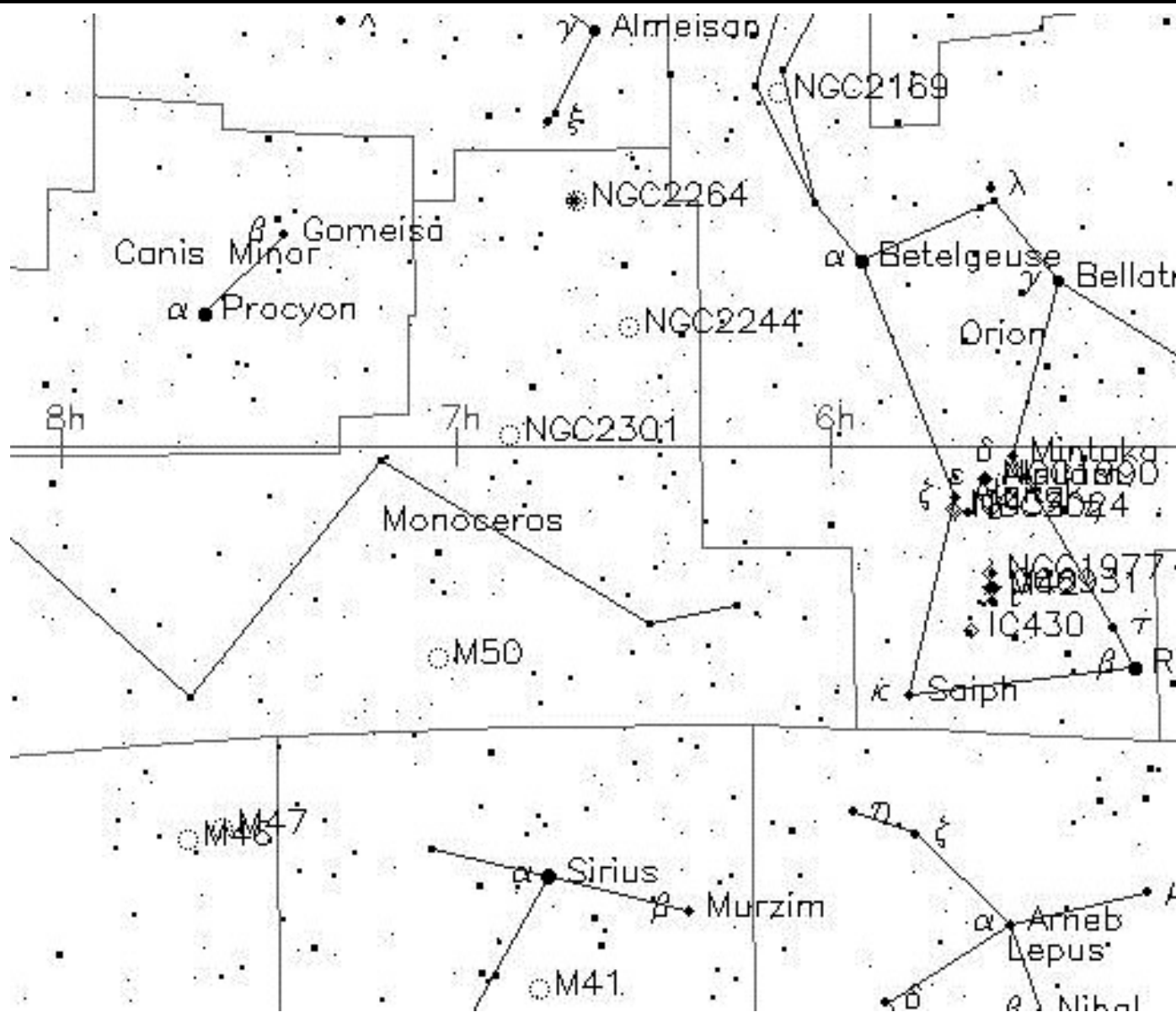
- Pour distilled water over the mirror and let it soak for a couple of minutes.

Constellation of February

- Add a couple of squirts of hand soap.
- With cotton balls, gently rolls the balls across the mirror surface in a radial pattern, carefully not pushing debris across the mirror's surface.
- Pour out the water and rinse with a generous amount of distilled water.
- Pour isopropyl alcohol across the mirror to displace the water.
- Tilt the mirror while it dries.

Before the February meeting, members are encouraged to observe deep sky objects in Monoceros, the seemingly blank area within the Winter Triangle stars of Sirius, Betelgeuse, and Procyon.

Monoceros holds many interesting targets: the Rosette Nebula (NGC 2237) and its associated star cluster, NGC 2244. Nearby lies the Cone Nebula and Christmas Tree cluster. Messier 50 is a fine open cluster found about 40% of the way between Sirius and Procyon.



February Constellation Challenge - Monoceros

By Michael R. Good

Typically the coldest month of the year, this February 2012 has been quite mild. We are asking members of the RVAS to take the "constellation" challenge and go out and view or image objects from Monoceros for the month of February, especially prior to our meeting on Monday Feb 20.

The most notable object that comes to MY mind is the gorgeous Rosette Nebula. Until this year, I have never been able to easily image this massive (1.3 degrees!) object. With my Burgess 91mm APO

and a 0.63 focal reducer, I took this image of the Rosette, using only one measly 5 minute exposure for Luminance, Red, Green, and two images for Blue. Captured with CCDSoft, reduced with AIP4Win, translated with Fits Liberator where a $\text{Log}(x)$ was applied to compress the brightness range, and then assembled into the LRGB in Photoshop CS4, this is one of the prettier images I have taken with almost no work. I decided to leave the blooming spikes in the image (astronomers would certainly not bother removing them!). Clearly the color noise

present can be eliminated by taking multiple sub-frames, but for such a "quick" astro-photo, you have to appreciate the beauty of this object.

Also attached is a snap of the mounting solution used, with the baby refractor mounted

piggy-back on the massive C14, driven by the Losmandy Titan at "MPO" observatory.

The Rosette Nebula (Caldwell 49) is a monster hydrogen cloud in our Milky Way, complete with the embedded NGC 2244



The Rosette Nebula in Monoceros

Michael R. Good Jan 24, 2012

star cluster at the center. Once the stars started fusing their hydrogen, their strong solar winds have carved out the central hole in the nebula.

Take your wide-field telescope out and find the Rosette Nebula, or go after the Christmas Tree Cluster (with Cone Nebula), or Hubble's Variable Nebula (looks like a comet), open cluster M50, or any number of fainter NGC clusters.

Monoceros is a tiny treasure in the sky.

TriStar: A great annual amateur astronomy gathering!

The Triad Starfest, *Tri*Star* for short, is a gathering of astronomers of all types, from novice to professional, for a full day of presentations, displays, and observing. The event allows astronomy enthusiasts to share ideas, learn about a range of astronomical topics, get together with old friends, and make new ones. The event will draw astronomers from North Carolina and surrounding states.

TriStar will take place on Saturday, 3 March 2012 in the Percy H. Sears Applied Technologies Center on the campus of Guilford Technical Community College in Jamestown, NC. In addition to a series of speakers scheduled throughout the day, there will be a wide range of astronomical displays, assorted astronomy-related vendors, prize drawings, "how-to" help for astronomy beginners, an astrophotography exhibition, and daytime and nighttime observing sessions (weather permitting).

Best of all, there is no registration fee!

If you would like to go and would like to car

pool, please contact John Goss, goss.john@gmail.com. In previous years, cars have left the Towers parking lot at 6:50 a.m. and returned around 8 p.m.

For complete information see: www.gtcc.edu/observatory/tristar/



Cline Observatory at GTCC

More stars. Less light.

Participate in GLOBE at Night!

Calling all Earthlings! Take a few minutes to get involved in the GLOBE at Night campaign to preserve dark skies!

GLOBE at Night is a citizen-science campaign open to people all over the world to raise awareness of the impact of light pollution by inviting citizen-scientists to measure their night sky brightness and report their observations to a website from a computer or smart phone. Light pollution threatens not only our "right to starlight," but affects energy consumption, wildlife, and health. Through 2011, people in 115 countries contributed 66,000 measurements, making GLOBE at Night one of

the most successful light pollution awareness campaigns to date. Please join us to participate in the 2012 campaign an hour after sunset until 10 p.m. February 12 through 21, March 13 through 22, and April 11 through 20. For information and resources, visit us at www.globeatnight.org.

Constance E. Walker, Ph.D.

director, GLOBE at Night campaign

National Optical Astronomy Observatory

950 N Cherry Ave

Tucson, AZ 85719



North America at night from space

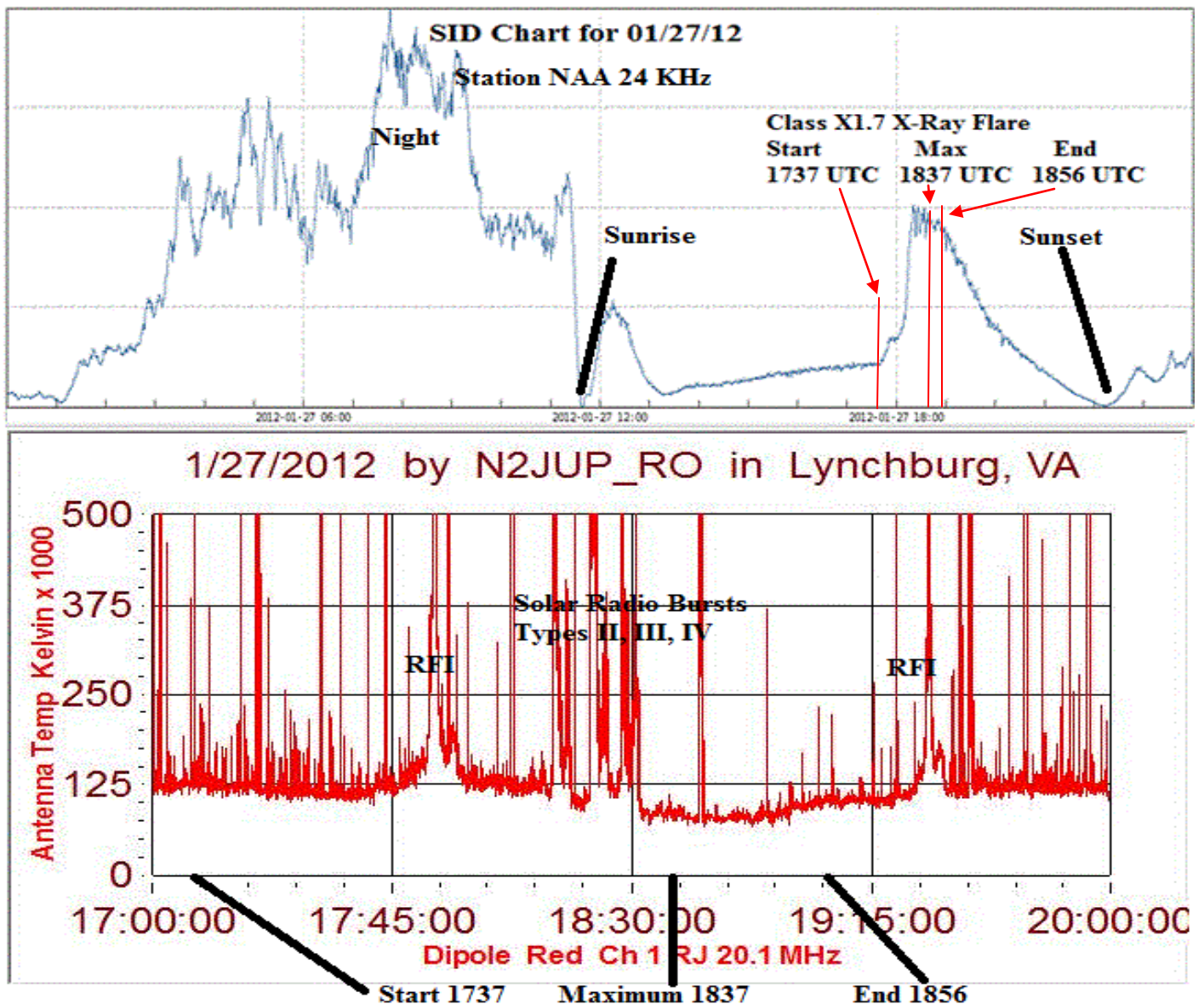
Observing report: X class Solar flare

By Dave Thomas

On [January 27th, at 17:37 Universal Time](#), the Sun Spot region 1402 on the Sun unleashed an X1.7 class solar flare. The event, with its powerful ultraviolet and X-Ray emission, increased the ionization of the earth's ionosphere causing it to absorb HF radio waves and disrupt HF radio communications.

As seen on the bottom chart, the antenna noise temperature dropped almost 50 thousand Kelvin at the flare maximum indicating a Sudden Ionospheric Disturbance caused by the X-Ray and UV radiation.

(More info on SID monitoring in the August 2011 RVAS newsletter)



M42 and NGC 1977 mosaic

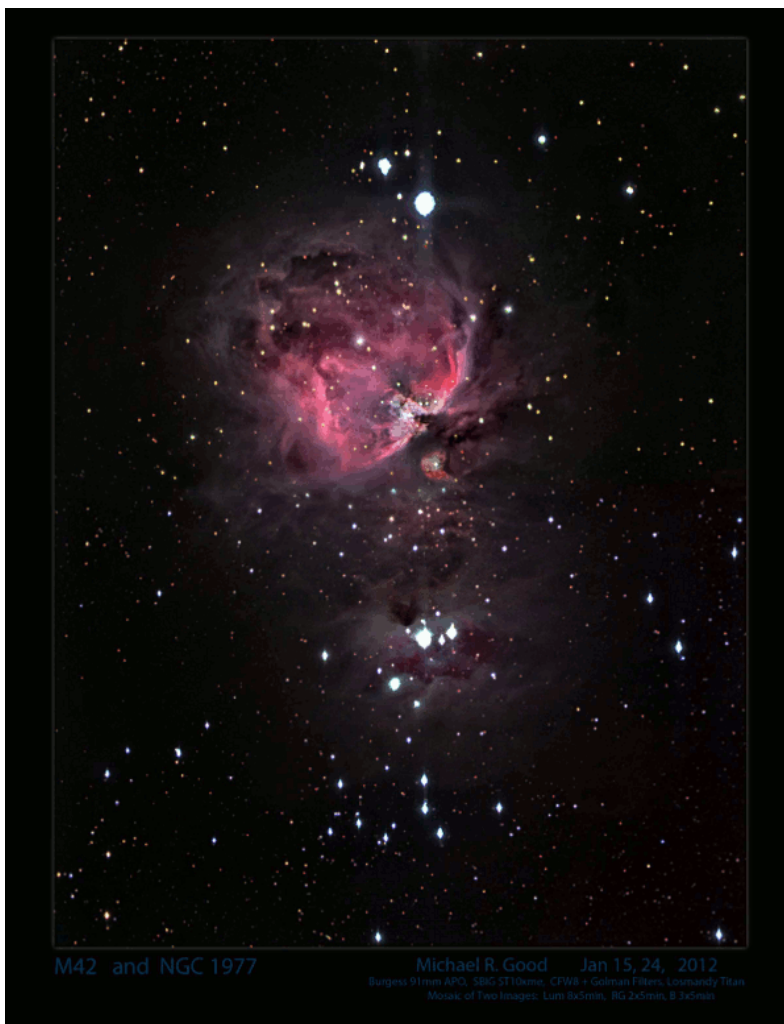
By Michael R. Good

This is an object that challenges our skills every single season. It is like a moth trying to avoid a light-bulb. Both visually and photographically, our brain draws us back to this area of our night sky, year after year.

This year is the first time I could try a larger field of view. Using a Burgess 91mm Doublet APO with a Celestron 0.63 focal reducer, I captured photons with five minute integrations (and 15 second integrations to get the core of the nebulaosity).

The challenge is no longer getting the data for me. The challenge is now PROCESSING the data. There are simply so many tricks that can be tried, yet

ultimately you do not want to over-process the data. With 40 minutes of luminance on each of two separate fields of view, I got to play with marrying multiple images, both in lum and in



color, as well as removing blooming tails from L, R, G, and B images on TWO different fields of view. This image took 6 hours to process, and as usual, I am still quite unhappy with it. I also used up a couple of my \$25 each color cartridges on my Epson 1400, trying to print 13x19" copies, and then not liking them and trying again. This had me ending up darkening

the image to hide noise artifacts. What a wonderful journey. Just think how much fun it will be to try again NEXT year!

The Universe Beyond the Multiverse

By Clark M. Thomas

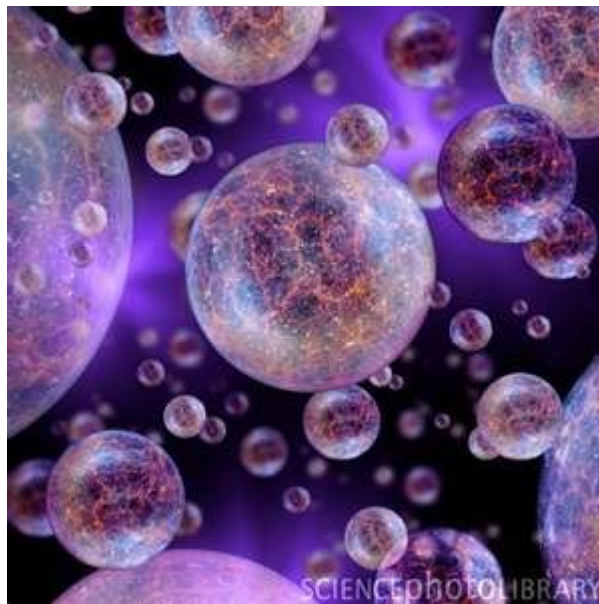
What greater mystery is there than what is beyond our visible universe, and then beyond the universe of universes, often called the multiverse? It is too easy to abandon hope for even partial enlightenment, when the lesser can never fully know the greater, and when induction and deduction have their limits. It is way too easy to just say that God is above it all, remembering that to evoke "God above it all" is to invite the specter of infinite regression, where there is no beginning. If God created or designed the universe, then who or what created God, even if the gods are outside our concept of time? Are we "divine" with or without a divinity; and just what is divine? It's all a seeming mystery.

Because I am a philosopher of physics, cursed by endless curiosity, I have found three tools to have a go at this greatest puzzle:

(1) *Genesis 1-11.*

Where it states that mankind is created in "the image" of God, it is meant that humans have value and virtue beyond just being created. Humans (and soon, comphumans) share in the creative "god essence." We are both created and creative. Our creator could be divin-

ity, directly or indirectly; or simply the great collection of matter and energy surrounding our lives. Our mind's eye can envision beyond what the eye sees. However, the price for this gift is ultimately to admit that there are sharp limits to what we can comfortably know, even while there are few limits to logical speculation.



Because we humans have a godlike ability to envision that which is beyond our telescopes and microscopes, then we may glimpse aspects of the multiverse. The multiverse, as I see it, is a collection of bubble-like "big-bang" universes at various ages, with a lot of "filler" among and within the boundaries of these bubbles. However, they all form one interpenetrating community with a common external boundary.

We live inside one of those bubbles. Our visible universe is mostly confined inside the Cosmic Microwave Background (CMB). Interestingly, there are ways to look at the CMB and detect "something" beyond. I have dealt with this emerging science in my essay, "Six Cosmological Fallacies." (See my <http://astronomy-links.net/cosmofallacies.htm>. You will need to read that essay to fully understand this es-

(Multiverse Continued on page 10)

say.)

(2) *Systems theory.*

All theories of dynamic reality are ultimately system theories. There is no way to be an astronomer without understanding systems, and systems of systems. There is no way to be a scientist or historian of any kind without embracing this fundamental feedback framework. Even pure mathematical theories exist within a logical system of their own design.

More important for our search herein is understanding how all the physical systems within the multiverse interpenetrate to produce a true multiverse, not just a community of adjacent bubbles.

(3) *The fundamental force.*

As explained in the *Cosmological Fallacies* essay (referenced above), the so-called four basic forces are actually variations on one force: gravity.

The strong nuclear force gravitationally holds together atoms, just as all other baryonic and dark matter is mutually attractive. In other words, the one unifying force presents us with a Theory of Everything, or a Grand Unified Theory. The holy grail of physics is easily comprehended within our divine brain. Einstein's bar maid could understand this.

HOW IT ALL COMES TOGETHER

The local universe in which we live is primarily expressed by the residue of its big bang.

Even though there are likely many residual elements within our bubble space from previous big-bang universes (black holes, ancient dwarf and failed stars, and much dark matter), the residuum of universes past does not define our bubble. Our bubble has a kinetic boundary, in front of which is visually the CMB. Beyond that boundary is where the "fun" begins.

It is tempting to fill the void in our knowledge with belief fantasies featuring all levels of divinity (from intimate, to designing and deistic), usually in some anthropomorphic form. I prefer to stick with scientific parsimony. So it is that the clear limits of "all that is" are unknowable to us forever. We will never be able to count the number of bubble universes within the multiverse. Still, we can look at the multiverse from within the new physics, and thereby say something about its boundary and what is beyond.

The idea of intelligent design is facilitated by many physics variables. Multiple variables can make Drake's Formula less likely to predict a nearby intelligent life form with which we can communicate. With few physics variables, such as the amazingly powerful formula for gravity, there may be less need for divine guidance to make sense of the cosmos. Nevertheless, even if all physical existence were refined to one physics variable, there would still be some logical room for divine guidance or design which we can never define.

Energy tends to be random until it is influenced by other energy. It is fair to hypothesize that by using multiverse gravity flows we can glimpse the shape of the multiverse at all levels from nano to cosmo. Let us start with

the odd relationship between photons and gravitons:

Photons "go out" from their individual atomic sources; but they also "come in" to us from many sources. For example, photons go out from the Sun, and come in to us as sunlight. Meanwhile we are also under the influence of photons and gravitons from a myriad of other celestial sources. It is commonly thought that photons are without mass, but this is not so. Gravitational lenses show light is influenced by matter. The equivalency of matter and energy is everywhere.

It is thought that other universes may have physics different from ours. For example, "antimatter" could dominate in another universe; and our flavor of "matter" could out there be as rare as antimatter within our universe. Antimatter is just matter with reversed polarity, so that when matter and antimatter particles interact they mutually annihilate. Nice, but this has little to do with overall gravity.

Even dark matter interacts with matter through gravity. It is through the gravitational effects of dark matter on visible matter, such as galaxies and their clusters, that we can indirectly "see" dark matter. Gravity also works at the smallest known dimensions, being the universal force, though it is given other names, such as the strong and weak nuclear forces.

Feedback is the essence of every system. Without feedback there is eventual chaos, as negentropy (order) devolves into stable entro-

py (chaos). The multiverse has gravitational feedback which determines the shape of the multiverse itself. Consider how the minor planet Ceres is round, but smaller asteroids are irregular in shape. That is because Ceres has enough mass for its gravity to pull everything into the most efficient shape, a sphere. Old elliptical galaxies tend to form rounded shapes. Billions of years henceforth the combined Milkmeda galaxy likely may express itself as elliptical, not spiral.

Dark energy is a misnomer for the increasing gravitational attraction of matter toward the boundary of our bubble. Gravitons from outside affect our universe, because they are by chance crossing through our universe from one side to exit on the other side. They coexist with gravitons inside our universe that tend to push things toward our many gravitational centers, due to myriad manifestations of curved space as Einstein saw it. The overall distribution of forces within our bubble shifts from inward to outward approximately five billion light years from us. The rate of acceleration away from our center increases as galaxies and other matter approach the boundary of our visible universe, and approach what is beyond.

It has been suggested that the community of bubbles continues outward infinitely, so why bother with further analysis. However, nobody has ever demonstrated how such infinitude must be so. On the other hand, the second law of thermodynamics would indicate that ultimate entropy is not yet here. Therefore, I feel it is fair to continue with a negentropic analysis, given the universal force operating within systems theory.

(Multiverse Continued from page 11)

The multiverse reveals itself as an organized whole of lesser wholes. Its rounded boundary would appear from an omniscient perspective as a slightly bumpy ball. The number of constituent universes at the boundary determines the relative "bumpiness" of the multiverse, with the size of the "bumps" being inversely related to their number.

Phenomena will be extremely dynamic within the defined outer barrier. That is because the outer level of universes will be kicking out photons and gravitons that have nowhere to go beyond where there is nearby matter. They will be attracted back to the extremely massive multiverse. It's like shooting a gun on Earth vertically. The bullet rises only as long as its initial kinetic energy exceeds the local force of gravity; and then it falls downward toward the center of Earth, increasing its kinetic energy in the return direction.

What is beyond the multiverse? It is fair to assume that there is chaotic hyperluminal energy beyond. Photons do not start fast enough to escape the universe of universes. At the same time the region of chaotic energy is not as strong near the multiverse as it is

farther away. Some of the nearby random particles are attracted to the multiverse as if it were a black hole. Thus, there is a gradient outward to where chaos is maximized and entropy stabilizes.

Another view of gravitons is that they may be nearly, but not totally, massless, with less mass than new photons. If so, then they could achieve hyperluminal velocities from any frame of reference. There is nothing about the multiverse that prohibits most gravitons, often expressed in our bubble as gravity waves, from flowing through the multiverse itself. Some small portion of these gravitons are captured by our gravity fields, both macroscopic and microscopic. In this way the myriad of gravitons mediates between the multiverse and the chaotic beyond. They provide the universality of energy and matter defined by the one force, gravity.

Beyond our concepts of dimensions is the true unknown. Are there gods there so distant, yet omnipresent; or merely a physical chaos we shall never fully comprehend? If there are real gods out there, they are surely different from the jealous, local tribal gods of human antiquity.

Astro-Quiz

In addition to stars, constellations and deep-sky objects, star charts often show the celestial equator, the ecliptic and even hour circles. But some charts also depict the Acolures. What are the colures?

Answer to Last Month's Astro-Quiz: The existence of a lunar atmosphere was still debated when the mathematician Leonhard Euler (1707-1783) viewed the annular solar eclipse of July 25, 1748. He projected an image of the eclipsed Sun onto a screen on which he'd drawn a circle just large enough to contain its disk. When the eclipsed Sun had become a crescent, Euler noted that its cusps extended beyond the circle, which he asserted was caused by refraction of the Sun's image through an appreciable lunar atmosphere. Detailed studies by the Jesuit astronomer Roger Boscovich (1711-1787) showed convincingly that Euler's assertion was incorrect.

The Roanoke Valley Astronomical Society is a membership organization of amateur astronomers dedicated to the pursuit of astronomical observational and photographic activities. **Meetings are held at 7:30 p.m. on the third Monday of each month, at Western Va. Community College Natural Science Center, 3102 Colonial Ave. S.W. Roanoke, Virginia. Meetings are open to the public.** Observing sessions are held one or two weekends a month at a dark-sky site. Yearly individual dues are \$20.00, Seniors \$18.00. Family dues are \$25.00, Senior Family \$22.00. Student dues are \$10.00. Articles, quotes, etc. published in the newsletter do not necessarily reflect the views of the RVAS or its editor.

RVAS web page: <http://rvasclub.org>

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CALENDAR OF EVENTS

By Frank Baratta

MONTHLY MEETING: Monday, February 20th, 7:30 p.m., Virginia Western Community College, Roanoke. The evening program to be announced .

RVAS WEEKEND OBSERVING SESSIONS: Unless otherwise indicated, observing sessions are held at Cahas Mountain Overlook, milepost 139 on the Blue Ridge Parkway.

◇ Friday and Saturday, February 10th and 11th. Sunset is at 5:55 p.m. Astronomical twilight ends at 7:23 p.m. The Moon rises at 9:23 and 10:33 p.m., respectively.

◇ Friday and Saturday, February 17th and 18th. Sunset is at 6:02 p.m. Astronomical twilight ends at 7:29 p.m. The Moon sets at 1:56 and 3:00 p.m., respectively.

◇ Future Sessions: March 16th and 17th; 23rd and 24th.

ROANOKE CITY PARKS and RECREATION PUBLIC STARGAZE: Saturday, February 11th, 6:45 p.m., Cahas Overlook, Milepost 139 Blue Ridge Parkway. Nonmembers must register with Parks & Rec. at 540-853-2236. Members can call 540-774-5651 for information. (Next session: March 10th, 7:00 p.m., Cahas Overlook.)