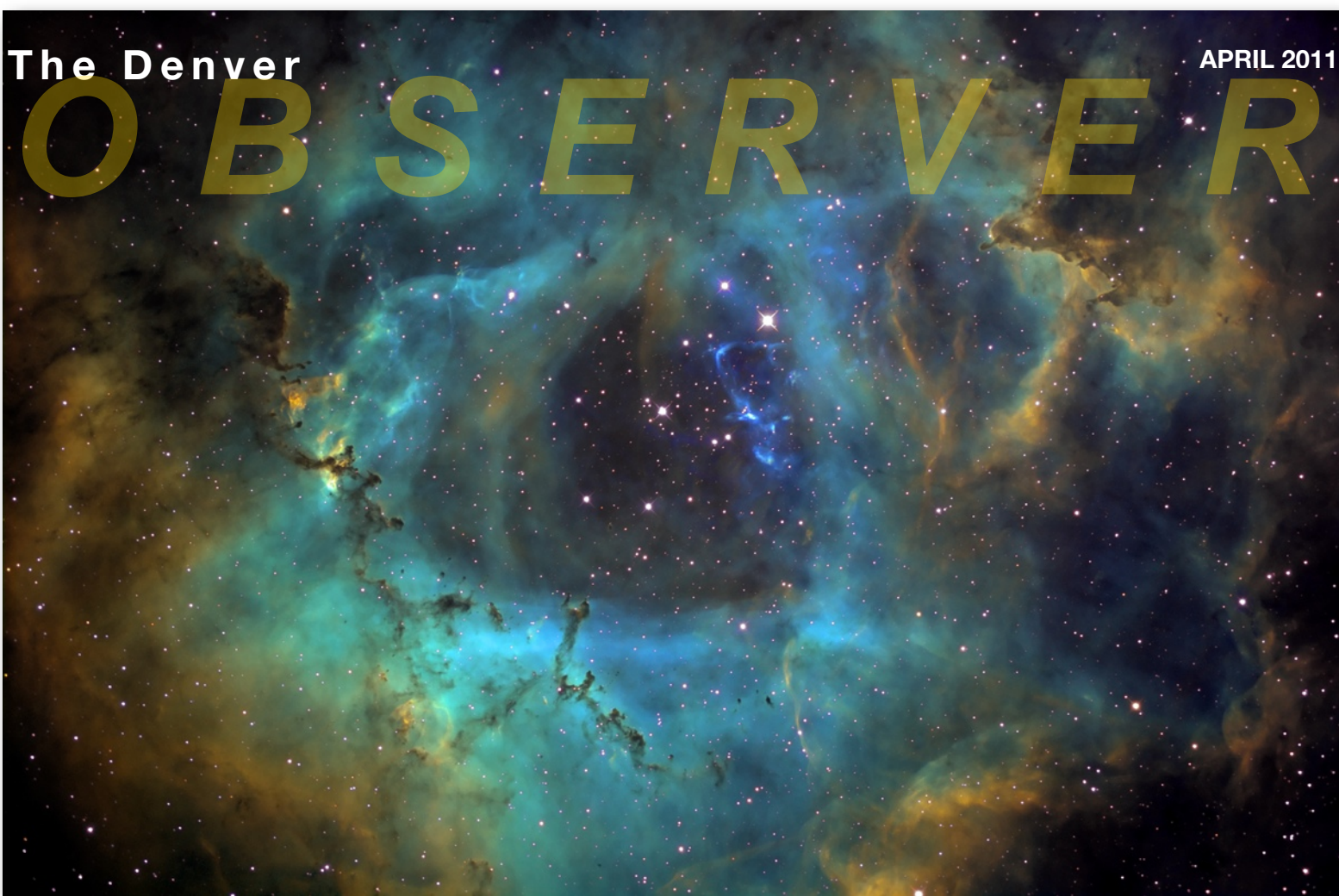


# OBSERVER



## APRIL CELESTIAL “FLORA”

A PALLET BY ANY OTHER NAME

Digital astro-images are amazing in their revelations, but when you minutely isolate certain wavelengths of light, the secrets that are uncovered are staggering. The Rosette Nebula, with its Bok globules and embedded star cluster NGC 2244, appears a completely different object through narrowband filters, namely H-alpha, S-II and OIII. Brian Kimball from Longmont recently completed the S-II portion of his image, combining the data to portray this beautiful gaseous flower in all its splendor.

Image © Brian Kimball

### Calendar

- 3..... New moon
- 11..... First quarter moon
- 17..... Full moon
- 24..... Easter Sunday
- 24..... Last quarter moon

### Inside the Observer

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## APRIL SKIES

by Dennis Cochran

“Five golden rings!” we sing at Christmas. Well, we’ve got at least three around Saturn, called A, B and C. C is the nearest to the planet and might not be visible in a small scope or on a bad day, er . . . night. B is the biggie and then there’s the Cassini Division, that dark gap between B and the outer A ring. The rings are mostly white, with the faintest hint of red. You can find even more rings if you’re a spacecraft cruising the outer solar system. (Mordak tells me they look great from the window of his flying saucer). Here on Earth, Saturn should be up all night—the star—as it were, of any public star party.

Leo is now the meridian dweller of 9 P.M., home from the hunt at earlier hours in the east. While a real lion may be surrounded by flies, our supine celestial lion is surrounded by galaxies. The best known of these is the M65 and 66 and NGC 3628 and 3593

group of four spirals located below the southwest corner of Leo’s rearend triangle. Another bunch of fainter galaxies lies inside the triangle up by the hypotenuse. Straight east of this group, a bit more than one triangle, is M85, a bright elliptical in the northern reaches of the Virgo Galaxy Cluster, nestled in with a bunch of NGCs. These ellipticals may be formed by the merger of spirals and may be what we will look like in the future when we merge with M31. Anyway, straight north of that is the spacious star cluster, Melotte 111, visible as a blur in Coma Berenices, a good binocular object. Back in Leo we find that Denebola, the star at the tip of the lion’s tail at the east end of the triangle, is a blue-orange binary.

Before we go west toward the front of Leo, drop 45 degrees down-left from the triangle to  $\gamma$  (gamma)

Continued on Page 3

# PRESIDENT'S CORNER

by Ron Pearson

When you joined the DAS, I bet you joined because you thought there were just a few people who might help you learn how to use your telescope or start finding those “billyuns and billyuns” of galaxies far, far away. And maybe you were expecting them to look just like they do in the Hubble telescope! Maybe you re-joined just to use our Dark Sky Site or just to come to our meetings, where we have great speakers on the current topics in astronomy or space sciences, and you really don't care much about what else goes on. Well, as the “Denver Astronomical Society” we are so much more than any one of those things.



As a society, we are group of people that come together to share our love of astronomy with you and everyone else. And for more than 60 years now a significant portion of the way we accomplish that is by supporting and even operating a Public Night program at the University of

Denver's 116 year-old Historic Chamberlin Observatory. That program at the observatory is, of course, focused on the 20-inch Alvan Clark-George Saegmuller telescope. We are also dedicated to our Edmund G. Kline Dark sky site, without which you would likely be stuck having to try and observe those faint fuzzies during new moons from your backyard or setting up on some lonely dusty dirt road out in the mountains or plains by yourself or with a couple friends the way I did years ago back in Illinois and Iowa. In short, you have joined an astronomy club with incredible resources that few other amateur clubs can

offer its members. But these resources require more than the average club member to see to their use and continuity.

These resources came about over 60 years by the hard work of others, most long-gone now, but all had a vision of what every amateur, and some professionals, dream of. The management of these resources and programs requires more than just one guy or gal sitting at a laptop computer or telephone. Passing on the good operation of the Clark telescope or the use of the EGK Dark Site to new members or building a new observatory requires members who are interested in more than their own Herschel 400 list certificate. This is why we constantly ask **you** to volunteer **your** time and talents to us as a Society. These are **your** programs; if you want them to continue, **you** have to participate in keeping them going. **You** are the new “others” with vision for the next 60 years. Balancing the wise-use of our limited resources, which include your money, is carried out by small dedicated group of individuals called the Executive, or E-Board.

This month we welcome several new E-Board members, including, Vice President Lisa Judd, Secretary Dennis Cochran, Ron Hranac and Chuck Habenicht. In addition, we have a new Public Night Team Lead Coordinator, Hugh Davidson, who is taking over for Ron Mickle.

Coming with these new offices are some big decisions right out of the gate. Dr. Stencel, Director of Chamberlin Observatory, has asked the DAS to co-share the costs of some much needed engineering maintenance work for the great equatorial mount of the Clark-Saegmuller telescope. At this time, we don't know the exact amount needed, but a 50/50-requested

*Continued on Page 6*

## DAS SCHEDULE

### APRIL

- 2-3 EGK Dark Sky weekend (Messier Marathon II weekend)
- 9 Open House at Chamberlin (Begins at 7:30 P.M.) Saturn viewing!
- 15 DAS General Membership meeting (Begins at 7:30 P.M.). Speaker: Mr. Craig Betzina: *Design and Construction of a Permanent Observatory.*
- 22 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)
- 23 Little Thompson Observatory Field Trip (See Page 6).

*Public nights are held at Chamberlin Observatory every Tuesday and Thursday evenings beginning at the following times:*

*March 9 - April 14 at 8:00 p.m.  
April 15 - September 1 at 8:30 p.m.  
September 2 - March 8 at 7:00 p.m.*

*Costs to non-members are: \$3.00 adults, \$2.00 children.*

*Please make reservations via our website ([www.denverastro.org](http://www.denverastro.org)) or call (303) 871-5172.*

### MAY

- 6-8 EGK Dark Sky weekend
- 7 DMNS Space Day - DAS Solar Observing, watch the *Observer* for forthcoming details.
- 14 Open House at Chamberlin (Begins at 8:00 P.M.) Saturn viewing!
- 20 DAS General Membership meeting (Begins at 7:30 P.M.). Speaker: Clark Chapman: *First science results from the Messenger Mission to Mercury.*
- 27 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)

### Society Directory

**President:**  
Ron Pearson (303) 670-1299  
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Dennis Cochran (720) 870-0465  
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Brad Gilman (720) 488-1028

### Executive Board Members

Jack Eastman Keith Pool  
Joe Gafford Tim Pimentel  
Chuck Habenicht David Shoultice  
Ron Hranac Dan Wray  
Ron Mickle, Past President  
President Emeritus, Larry Brooks

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**Van Nattan-Hansen Scholarship Fund:**  
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Darrell Dodge, Interim Chair  
Email: [darksite@denverastro.org](mailto:darksite@denverastro.org)  
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**Student Astronomy Chair:**  
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Denver, Colorado 80210

*The Executive Board conducts the business of the DAS at 7:30 p.m. at Chamberlin Observatory. Please see the Schedule of Events for meeting dates. All members are welcome.*

[www.denverastro.org](http://www.denverastro.org)

## APRIL SKIES (CONTINUED FROM PAGE 1)

Virginis, the bright star at the bottom of the “bowl” of Virgo. It is a well-known double star with a separation of four arc-seconds. And while you’re down there, drop straight down from  $\gamma$  (gamma) Virginis to the topmost star of four-sided Corvus the Raven, which is its Delta. It’s a yellow and blue double. In between  $\gamma$  (gamma) Virginis and  $\delta$  (delta) Corvi, but closer to Delta, is M104, the famous Sombrero Galaxy, an edge-on spiral located just west of a whole bunch of Virgo Cluster NGCs. From  $\delta$  (delta) Corvi one can slip southwest down past  $\gamma$  (gamma) Corvi and continue a similar distance to find the Antennae interacting galaxies, NGC 4038 and 4039. Then, back at Leo’s triangle, we’ll start to move to the right, west.

## DISCOVERY SPACE SHUTTLE AND THE INTERNATIONAL SPACE STATION

The beautiful last flyover of Space Shuttle Discovery with the International Space Station occurred on March 8. Ron took this with a Canon 7D camera from his deck in Evergreen. They were about one minute apart, so he used the old “hat trick” method to get a “double exposure” with both in the same view.

Image © Ron Pearson



We’re heading toward the Alpha star of Leo— Regulus. But halfway there we run into another group of galaxies: M95, 96 and 105. 105 is a small elliptical, while 95 is a spiral and 96 a barred spiral. Above these three are fainter NGCs. When we get to Regulus we turn left and go straight up along the sickle-shaped mane of Leo to the brightest sickle star, Gamma. This binary is comprised of two yellow stars that orbit each other every 407 years. Two degrees away is the radiant of the November Leonid meteor shower—not that it’s anything you can see. To the left of and above Gamma are several NGC galaxies. The next sickle star up is Zeta, another double, widely-spaced enough for binoculars.

Most charts should show the next two stars at the top of the sickle, Mu and Epsilon. At this point, we are entering the region featured by Steve Gottlieb in the March *S&T* on page 68, “Galaxy Group AWM1.” Start out by dropping just below Lambda to NGC 2903, a bright starburst spiral, supposedly barred (I couldn’t see that feature.) The elliptical NGC 2804 is next, down-right from 2903 and also down-left from the  $\xi$  (xi) star of Leo, shown on Gottlieb’s inset and the top of the photograph on page 69. The rest of the group is below 2804. 2804 and 2809, another elliptical down-left from it, should be visible in 8-inch scopes. The other galaxies are fainter; use the photograph to chase them down. Rest your tired eyes for a minute and then swing west to find the Beehive Star Cluster, M44, also known as Praesepe, the Manger. This is in Cancer at the intersection of its three legs.

The early morning of April 21st, 22nd or 23rd will be the peak of the hard-to-predict Lyrid meteor shower, whose radiant rises after midnight, not



## THE WITCH HEAD NEBULA

The Witch Head nebula in Eridanus (IC2118) reflects the light of the giant star Rigel (Orion’s right knee), which is just to the east (on the right in this south-up image.) Absent from most observing lists, the Witch Head is difficult to observe, but can be glimpsed on excellent nights in small refractors or very big Dobs. Details only emerge in long-exposure photos. Darrell Dodge took 54-minutes of exposures with a modified Canon 450D through an AstroTech AT72ED refractor (with an AT2 field flattener) at the EGK Dark Site on January 28, 2011. Processed with Nebulosity 2.3 and Photoshop CS5.

Image © Darrell Dodge

that one has to see the radiant in order to see most of the meteors, since these will be streaking overhead, coming from the east. I hope your skies are clear and dark!

## ABOUT THE DAS

Membership in the Denver Astronomical Society is open to anyone wishing to join. The DAS provides trained volunteers who host educational and public outreach events at the **University of Denver’s Historic Chamberlin Observatory**, which the DAS helped place on the National Register of Historic Places. First light at Chamberlin in 1894 was a public

night of viewing, a tradition the DAS has helped maintain since its founding in 1952.

The DAS is a long-time member in good standing of the **Astronomical League** and the **International Dark Sky Association**. The DAS’ mission is to provide its members a forum for increasing and sharing their knowledge of astronomy, to promote astronomical education to the public, and to preserve Historic Chamberlin Observatory and its telescope in cooperation with the University of Denver.

The DAS is 501 (c)(3) tax-exempt corporation and has established three tax-deductible funds: the Van Nattan-Hansen Scholarship Fund, the DAS-General Fund and the Edmund G. Kline Dark Site Fund. To contribute, please see the bottom of the membership form for details (found on the DAS website: [thedas.org](http://thedas.org)).

More information about the DAS, its activities and the special tax-deductible funds is available on the DAS website at [www.denverastro.org](http://www.denverastro.org).



# THE CLEANING OF A CLASSIC (*Part One of Two*)

Article by F. Jack Eastman

Photos courtesy of Chris Ray

A decision was made early in 2010, after the visit from Chris Ray and Fred Orthleib of the Antique Telescope Society (ATS) that we should remove, disassemble and thoroughly clean the 20-inch Clark objective of Chamberlin Observatory's historic telescope. The task was to begin September 28 and continue for at least four days.

To my knowledge, I don't believe the lens had been properly cleaned since it was installed in 1894. It most likely had its front surface cleaned in situ (perhaps during Dr. Everhart's directorship) and the front element may have been removed, but there are no records indicating what was actually done or when. We intended to provide complete documentation of the disassembly and cleaning process, as well as measure the curvatures, thicknesses and spacings of this lens assembly.

It is fortunate that this telescope is of the Boyden design, one of two (that I'm aware of) where the front element is in its own cell and is designed to be reversed, changing the airspace, thereby changing the color correction to the photographic blue and shortening the focal length by an order of a meter or so. This proved to be a distinct advantage, as the separate cells for the two lenses would be easier to handle and the removal of the glass from the cells would be considerably easier.

On Wednesday, September 29th, the team assembled at Chamberlin Observatory. It consisted of Chris Ray, from ATS, who would preside over the operation, Dr. Robert Stencel, Observatory Director, Aaron Reid, Observatory Administrator and me. Chris has had extensive experience in the restoration and maintenance of old and large telescopes, and his knowledge and experience was an invaluable asset to the success of this job. Also helping was DU student Brian Kloppenborg, whose assistance was greatly appreciated. Incidentally, Brian is featured in the April issue of *Sky & Telescope* in a wonderfully informative article on digital photometry.

The first operation was to aim the telescope down at the floor and securely tie the tube to the pier, as the instrument would be many foot-pounds out of balance after removal of the objective. Aaron produced plywood cutouts that fit against the telescope tube and the pier, secured these in place with two-by-fours, and tied the telescope to the pier with several turns of climbing rope. Earlier in the year, the loose screw that was rattling around in the tube had been removed (it proved to be a pin from a broken internal u-joint that was subsequently repaired last spring when the RA clamp and slow-motion system was serviced), so there was no danger of anything landing on the rear of the lens.

The three screws holding the front (crown element) cell to the rear cell were carefully removed and the cell carried by the four of us over to the table provided for the operation (cell and glass weight: 118.5 pounds.) The six screws holding the rear (flint element) cell were removed (again, carefully) and the cell containing the flint element was carried to the operating table (cell and glass, 80 pounds). The retaining ring was removed and the cell picked up and very carefully lowered over a table-mounted tripod, which would hold the glass as the cell was lowered over it, thereby removing the glass from the cell. This tripod was essentially an upside-down three-legged stool with soft lint-free pads on the "feet" that would support the glass.

Once this was accomplished, the bare lens could be carried over to the cleaning stand and washed with mild detergent and distilled water, rinsed with distilled water and dried with lint-free cotton pads. While the glass was out, the cell was thoroughly cleaned and all signs of rust and corrosion were removed. It was interesting to see a polished silvery ring ~6 mm wide inside the cast iron cell which defined the lateral position of the glass. The material of this ring may have been German Silver, a composite of copper, zinc and nickel that has great resistance to corrosion and is also used for the finely-engraved setting circles on the telescope and for transit instruments, sextants and the like.

The cleaning and rinsing procedure was repeated for the front cell. This time, however, we met with difficulty. There was much rust and corrosion which prevented the retaining ring from being removed. The retaining screws were reinstalled from the inside of the cell, giving us "handles" on which we could exert more force; the ring finally came out with much difficulty. This rust and corrosion also prevented the glass from coming out. One heart-

stopping moment was when the glass cell from the 20-inch Clark refractor at Chamberlin. Undertaking the cleaning of the elements proved less daunting than first thought, and Chris's knowledge and experience were invaluable in understanding the various components of the assembly and how best to restore it probably fell them.

only a couple of millimeters, but it was a scary moment. No harm, no foul, but we gave up at this point and Aaron spent considerable time scraping rust and corrosion out of the cell, especially around the edge of the glass. The cell was flooded with soapy water and we tried again to remove the glass, this time with success.

As the glass was removed, the positions of the lenses (clock angle) relative to the cell were marked with a waterproof marker, also indicating the direction the lens element was found so we wouldn't replace the lens backwards. The outer surface of the front element (the crown) was very dirty, so Chris decided to give it a collodion treatment. Collodion is gelatin dissolved in ether (note: gotta be used in a well-ventilated area!) Chris painted a layer of the stuff on the lens, placed a sheet of cheesecloth on it and applied a second coat. After several minutes this coating was peeled off, and all the crud on the glass came with it, a very effective trick for removing all the particulate matter otherwise stuck to the glass without any rubbing or other action which could damage the lens surface. The lens was then washed as before with the flint element. The cell was thoroughly cleaned and treated with "rust reverser," a chemical that turns rust into a harmless polymer and prevents any further damage and corrosion. Aaron determined the point on the cell that is at the bottom when the telescope is stowed and drilled a small "weep hole" just behind the silver edge support which would allow condensed



Chris Ray, from the Antique Telescope Society, examines the lens cell from the 20-inch Clark refractor at Chamberlin. Undertaking the cleaning of the elements proved less daunting than first thought, and Chris's knowledge and experience were invaluable in understanding the various components of the assembly and how best to restore it probably fell them.

moisture to drain out and help prevent any further corrosion. It was noted that there were stains on the lens from the bronze blocks that supported the glass, indicating that the crown element had rotated or was incorrectly assembled after a previous cleaning, with the position having shifted about twice the width of the blocks. After a best-effort at removing these stains, which involved a bit of polishing with optical rouge (well outside the clear aperture of the lens)! it was reassembled in what we thought was the proper orientation.

**LENS CHARACTERIZATION:**

With the objective completely disassembled we had the perfect opportunity to measure everything we could. Chris measured, and documented, every possible dimension of the cells and I measured the curvatures on the 4 lens surfaces using a spherometer with feet on a 202.6 mm circle. The probe was a Starrett dial indicator, 0.2"-travel reading to .0001-inch (2.5 um). I have a 7-inch optical flat which can be used to zero the smaller instruments. I also have a larger (8.5-inch diameter) piece of glass, which looks much like a plate glass mirror blank and appeared to be flat on both sides. Using the small spherometer, I compared it to the known optical flat; it seemed to be flat to the accuracy of the small spherometer. I also placed it in front of my 32 cm Newtonian. It did defocus the image very slightly and caused a minimum of image degradation—it may have been a window of some sort in another life. Zeroing-out the large (y=101.3 mm) spherometer on this glass, then measuring the radius (R) of my 32- cm mirror, I came within less than -1% of the accepted value of 4866 mm—I declared it flat enough for our purposes.

The formula I used,  $R=(Y^2)/2s$  (i) (where R=radius of curvature of the surface in question, Y=the radius of the circle containing the feet of the spherometer and s=sagitta [depth of the curve on the surface as read from the dial probe]) is exact for a paraboloidal surface. A small error is present for a spherical surface, but even for the strongest curve, it is less than the precision of the spherometer, so I ignored it for this exercise.

We measured the lens edge thicknesses, edge separation and lens glass diameter (21.38 inches [542.9 mm]), The edge thicknesses and spacing is 12.4 mm for the crown (front element), edge spacing, 37.6 mm and 27.7 mm for the flint (rear element). Then, from our measured radii of curvature we derived the following dimensions for the lenses: Center thickness of the crown element 37.3 mm, the flint, 14.1 mm and the airspace (normal, or visual configuration) is 37.9 mm. Airspace for photographic configuration (reverse the cell for the front element) is 175.5 mm. The radii of curvatures on the four lens surfaces are, starting from



Chris applies a collodion preparation to the front surface of the crown element. This highly-flammable mixture of pyroxylin, ether and alcohol adheres to solid contaminants on the lens. Draping a layer of cheesecloth over the top and allowing the mixture to dry permits the debris to be removed safely, without scrubbing, by peeling the cloth slowly from the surface.

the front of the lens, R1=3151. mm, R2=-2760. mm, R3=-2704. mm and R4=flat. Positive radius is convex to the front (sky side) of the lens, negative is concave forward. Following this convention, the crown element is double convex, the flint plano-concave. We then set the flint element on the cleaning stand and with a small light determined the radius of curvature of the concave surface with a Foucault-like test, and obtained 2705+/-5 mm, close enough to the spherometer reading. We feel the thicknesses and spacing are good to the order of one millimeter and the surface radii to the order of about +/- 0.6 per cent.

The crown element weighed in at 31 pounds, the flint at 39 pounds—surprisingly light, but the lenses were very thin, much thinner than I expected; thinness seems to be a characteristic of Clark lenses. The cell's total weight added up to 128.5 pounds, and with 70 pounds of glass, the total weight of the lens and cells is 198.5 pounds, considerably less than my first guess at ~500 pounds.



ameter (21.38 inches [542.9 mm]), The edge thicknesses and spacing is 12.4 mm for the crown (front element), edge spacing, 37.6 mm and 27.7 mm for the flint (rear element). Then, from our measured radii of curvature we derived the following dimensions for the lenses: Center thickness of the crown element 37.3 mm, the flint, 14.1 mm and the airspace (normal, or visual configuration) is 37.9 mm. Airspace for photographic configuration (reverse the cell for the front element) is 175.5 mm. The radii of curvatures on the four lens surfaces are, starting from

**Table 1) 20-inch Lens Prescription (visual configuration)**

Surf.	Radius (mm)	Thickness (mm)	Material	Nd	Vd
1	3151.	37.	Glass	Unk	Unk
2	-2760.	38.	Air		
3	-2704.	14.	Glass	Unk	Unk
4	Inf		Air		

**Table 2) 20-inch Lens Prescription (photographic configuration)**

Surf.	Radius (mm)	Thickness (mm)	Material	Nd	Vd
1	2760.	37.	Glass	Unk	Unk
2	-3151.	175.	Air		
3	-2704.	14.	Glass	Unk	Unk
4	Inf		Air		

(Note: Nd is the refractive index for the yellow helium line, Vd is the Abbe number, related to the dispersion of the glass, difference in index between the red C hydrogen line and the blue F hydrogen line.  $Vd=(Nd-1)/(NF-NC)$ , NF and NC being the indices at the F and C lines).

*This article will be continued in the May 2011 issue of the Observer.*

## NASA'S SPACE PLACE

## GOES-R, ZOMBIE FIGHTER

A Space Place Partner Article  
by Dr. Tony Phillips

On April 5, 2010, something eerie happened to the Galaxy 15 telecommunications satellite: It turned into a zombie.

The day began as usual, with industry-owned Galaxy 15 relaying TV signals to millions of viewers in North America, when suddenly the geosynchronous satellite stopped taking commands from Earth. It was brain dead! Like any good zombie, however, its body continued to function. Within days, Galaxy 15 began to meander among other satellites in geosynchronous orbit, transmitting its own signal on top of the others'. Satellite operators scrambled to deal with the interference, all the while wondering what happened?

In horror movies, zombies are usually produced by viruses.

"In this case, the culprit was probably the sun," says Bill Denig of the National Geophysical Data Center in Boulder, Colorado. He and colleague Janet Green of NOAA's Space Weather Prediction Center recently led a study of the Galaxy 15 anomaly, and here are their conclusions:

On April 3rd, a relatively minor solar flare launched a cloud of plasma toward Earth. Galaxy 15 had experienced many such events before, but this time there was a difference.

"Galaxy 15 was just emerging from the shadow of Earth when the cloud arrived and triggered a geomagnetic storm," explains Denig. Suddenly exposed to sunlight and the ongoing storm, "the spacecraft began to heat up and charge [up]."

Electrons swirling around Galaxy 15 stuck to and penetrated the spacecraft's surface. As more and

more charged particles accumulated, voltages began to rise, and—zap!—an electrostatic discharge occurred. A zombie was born.

"At least, this is what we suspect happened based on data collected by GOES satellites in the vicinity," he says. "We'll be able to diagnose events like this much better, however, after GOES-R is launched by NASA in 2015."

GOES-R is NOAA's next-generation Geostationary Operational Environmental Satellite. One of the instruments it will carry, a low-energy electron counter, is crucial to "zombie fighting." Low energy electrons are the ones most likely to stick to a spacecraft's surface and cause brain-frying discharges. By monitoring these particles in Earth orbit, GOES-R will provide better post-mortems for future zombie outbreaks. This could help satellite designers figure out how to build spacecraft less susceptible to discharges. Also, GOES-R will be able to issue alerts when dangerous electrons appear. Satellite operators could then take protective action—for example, putting their birds in "safe mode"—to keep the zombie population at bay.

Meanwhile, Galaxy 15 is a zombie no more. In late December 2010, after 9 months of terrorizing nearby spacecraft, the comsat was re-booted, and began responding to commands from Earth again.

**WARNING!**

The Galaxy 15 communication satellite was "brainless" for several months in 2010 after being exposed to a geomagnetic storm. The new GOES-R satellite will warn of such dangers.

Courtesy NASA/JPL

All's well that ends well? True zombie fighters know better than to relax. Says Denig, "we're looking forward to GOES-R."

You and the kids in your life can learn about space weather at <http://scijinks.gov/space-weather-and-us>.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

## LITTLE THOMPSON FIELD TRIP PLANNED

by Ron Pearson



DAS members, we are planning a field trip to the Little Thompson Observatory (LTO) in Berthoud Colorado on April 23. We will visit the observatory and observe from 7:30 P.M. to 9:30 P.M. The plan is meet at Chamberlin Observatory in Denver and carpool to Berthoud from there. However, if you live north and wish to drive on your own you can meet us at the LTO at 7:30 P.M.

To RSVP use the poll link on the denverastro yahoo group web page. This poll will give us a count

of the number of people going. There is no cost for the trip other than your gas. Please select a choice for going from Chamberlin or to drive on your own. You only need "vote" if you plan on going. Information about Little Thompson Observatory is found at: <http://www.starkids.org/>. If you are not a member of the denverastro yahoo group please send an email by April 21st, with LTO in the subject line, to [president@denverastro.org](mailto:president@denverastro.org) and indicate if you will carpool or drive on your own.

## PRESIDENT'S CORNER (CONTINUED FROM PAGE 2)

share of the costs requires a significant portion of our DAS funds, in the tens of thousands. This request is not to be taken lightly.

As you've likely read in past *Observers*, the DAS potentially faces a big decision in the not-too-distant future regarding our EGK Dark Site. We may lose our lease or we may be given an opportunity to buy the land, or we may face other choices not as palatable if we are to have a dark site for YOU our

members. As all good managers with limited resources, we need to hope for the best and plan for the worst. How the E-Board will balance the Yin and Yang of this uncertain future will be seen in the coming months. But the Board members are not sitting on the side-lines and we are all hoping you aren't either, even if you only thought you joined to figure out which new eyepiece to buy.





**A ROSE BY ANY OTHER  
COLOR**

is still a Rose. This more "true color" version of The Rosette Nebula (NGC 2237) was imaged in Darrell's backyard in Littleton, CO. on January 4th. He used a Canon 450D camera through an AstroTech AT72ED f/6 refractor.

Image © Darrell Dodge

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