Longmont Astronomical Society

May 2026

Abell 1656 (Coma Cluster)
by Martin Butley

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Next LAS Meeting on Thursday May 21 at 7 pm

" Webb, Roman and HabWorlds - Space Telescopes at the Astronomical Frontier" by Dr. Gregory Wirth

Synopsis

Join us for an evening with Dr. Gregory Wirth of BAE Systems on the remarkable technologies behind NASA's current and future space telescopes.

Learn how the pending Nancy Grace Roman Space Telescope promises to change our ideas about dark matter and dark energy with a camera 100 times more powerful than those on Hubble and Webb. Get a glimpse into the future with NASA's ambitious Habitable Worlds Observatory, designed to identify and study Earth-like exoplanets using cutting-edge optics technology. And learn what new astronomical discoveries NASA's new James Webb Space Telescope is delivering with its astonishingly sharp infrared images of the universe. This accessible talk is geared to all with an interest in astronomy.

Bio

Dr. Gregory D. Wirth is an astronomer and Principal Systems Engineer oat BAE Systems Space & Mission Systems in Boulder, Colorado.

He specializes in space-based astrophysics instrumentation and has contributed to major NASA missions, including helping commission the James Webb Space Telescope (JWST). His work builds on BAE Systems' (formerly Ball Aerospace) legacy in flagship observatories such as Hubble, Spitzer, and Chandra.

He earned a Ph.D. in Astronomy & Astrophysics from the University of California, Santa Cruz, with thesis research using early Hubble Space Telescope data. He previously spent 16 years as a support astronomer at the W. M. Keck Observatory in Hawaii.

Location

The meeting will be at 7pm in the First Evangelical Lutheran Church, 803 Third Avenue, Longmont, CO 80501. It will also be available to LAS members on Zoom.

About LAS

The Longmont Astronomical Society Newsletter ISSN 2641-8886 (web) and ISSN 2641-8908 (print) is published monthly by the Longmont Astronomical Society, P. O. Box 806, Longmont, Colorado. Newsletter Editor is Vern Raben. Our website URL is https://www.longmontastro.org and the webmaster is Mike Hotka. The Longmont Astronomical Society is a 501 c(3), non-profit corporation which was established in 1987.

The Longmont Astronomical Society is affiliated with the Astronomical League (https://www.astroleague.org). The Astronomical League is an umbrella organization of amateur astronomy societies in the United States.

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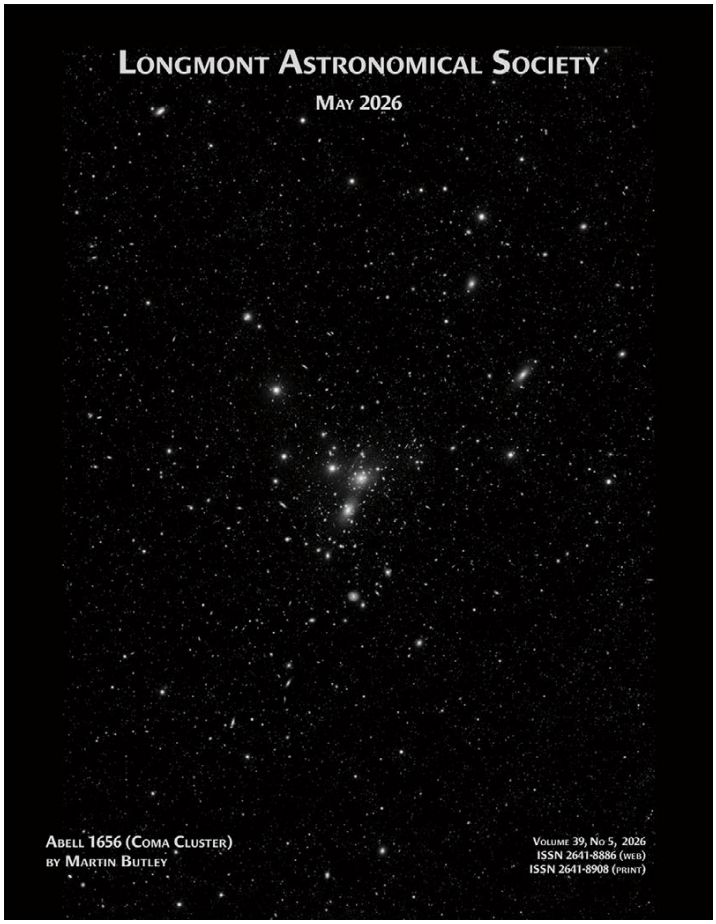
Front Cover: Abel 1656 (Coma Cluster) by Martin Butley



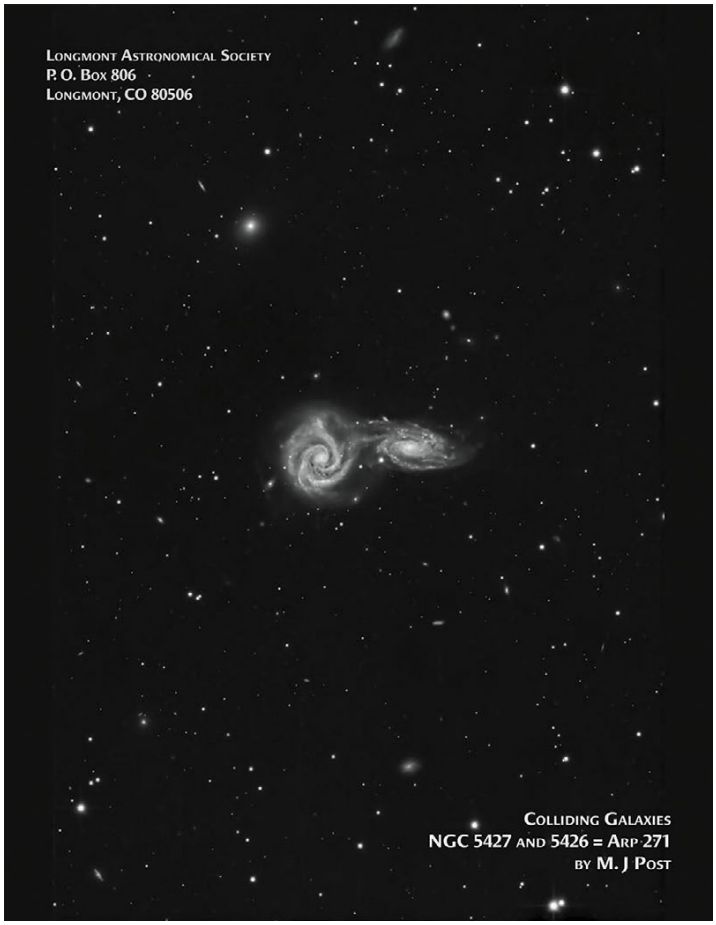
One of the first galaxy clusters that was remarked upon in the astronomy literature, it was visually noted by William Herschel in 1785 and photographically surveyed by Max Wolf in 1901.

The Coma cluster contains about 800 galaxies within a 100 × 100 arc-min area at a mean distance from Earth of 321 million light years. (Six times further than Markarian's Chain in the Virgo cluster). The central region of Abell 1656 is dominated by two super giant elliptical galaxies: NGC 4874 and NGC 4889. About 90% of the mass of the Coma cluster is believed to be in the form of dark matter.

Taken at Starry Meadows with a Takahashi 130 FSQ refractor (f/5) and a ZWO ASI 6200 camera. 10 hours Luminance, 1.5 hours each RGB, total integration 14.5 hours (5 min subs).

Marty

Back Cover: Colliding Galaxies NGCs 5427 and 5426 = Arp 271 by M. J Post



These two nearly face-on galaxies in Virgo were discovered by William Herschel in 1785. They are just beginning their "collision" and will continue interaction for another 100 million years or so. Is this a "trailer" for the Andromeda and Milky Way "collision" in our future?

NGC 5427 is the larger of the two and is northern-most. It is similar in size to our Milky Way - 130 k.l.y. in breadth. Both are quite distant, about 130 M.l.y. FOV here is about 21 x 14 arc minutes.

CDK14 scope, DSNM, 3.5 hours on target.

M.J. Post

Planets in May

Mercury

Mercury becomes visible in binoculars in the WNW on the last 3 or 4 days in May. It is around -0.6 magnitude in brightness and the dis is about 6 arc sec across.

Venus

Venus is visible in the evening sky in the west. It is magnitude -4 in brightness and its full disk is around 13 arc sec across.

Mars

Mars reappears in the eastern morning sky after the 15th at 1.3 magnitude in brightness and 4.2 arc sec across.

Jupiter

Jupiter is in constellation Gemini. Best time to view Jupiter is between 8 and 9 pm. On the first it is -2.1 magnitude in brightness and the disk is 35 arc sec across. By the 30th it is 33 arc sec across and -1.9 magnitude. There are just a few good times left to view the Great Red Spot this apparition:

Date	Time	Altitude
May 1	10:59 pm	24°
May 4	8:30 pm	50°
May 6	10:09 pm	30°

Date	Time	Altitude
May 11	9:19 pm	36°
May 18	10:09 pm	22°
May 23	9:19 pm	29°

Saturn

Saturn becomes visible in the eastern morning sky around May 6. It is +0.8 magnitude in brightness and the disk is 17 arc sec across.

Uranus

Uranus is not visible this month. It will re-appear in the morning sky after July 9 if you use binoculars.

Neptune

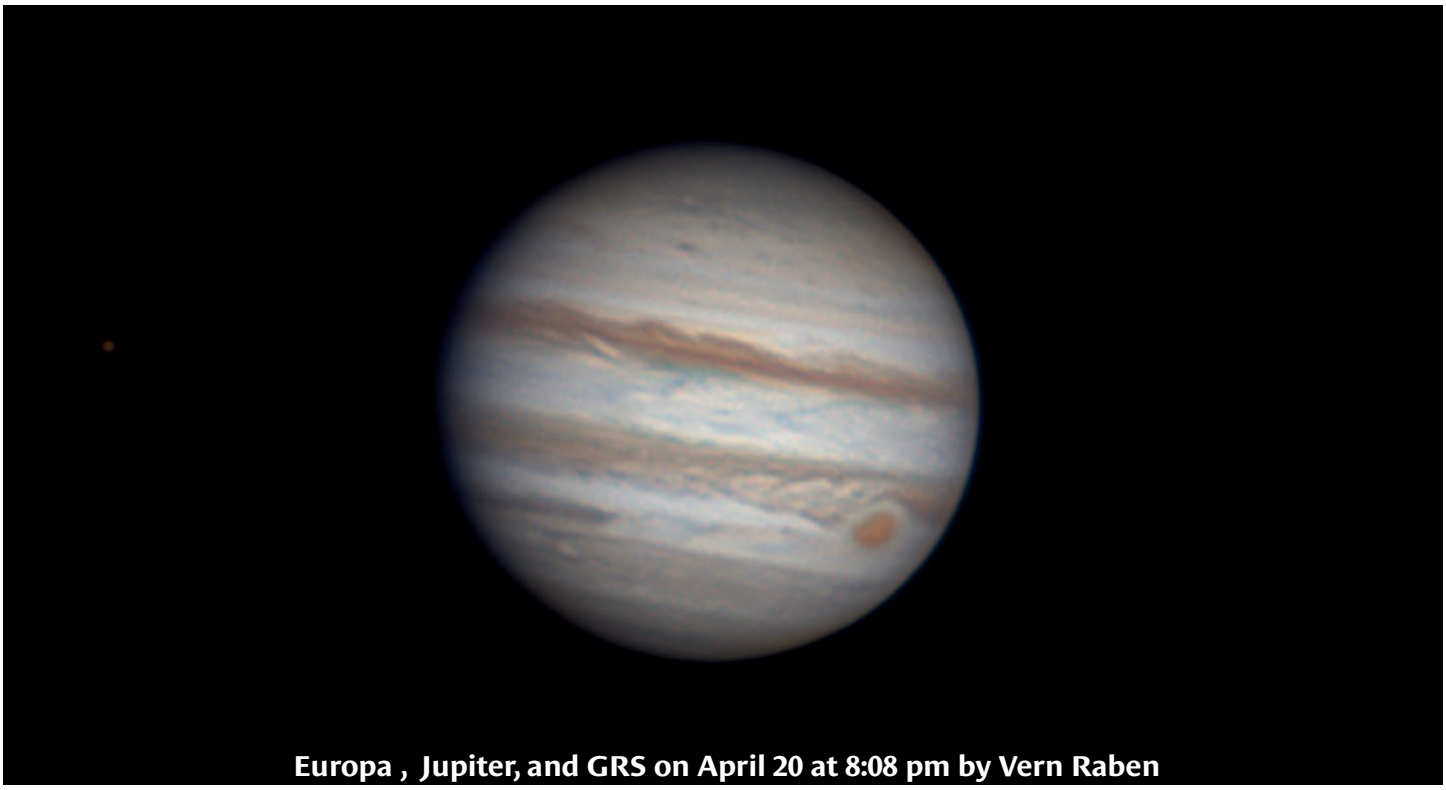
Neptune is not visible this month, It will re-appear in the morning sky after the first week of June in binoculars.

Lunar Phases in May

May 1 at 11:24 am - Full Moon
May 9 at 3:12 pm - Third Quarter Moon
May 16 at 2:02 pm - New Moon
May 23 at 5:12 am - First Quarter Moon
May 31 at 2:46 am - Full Moon

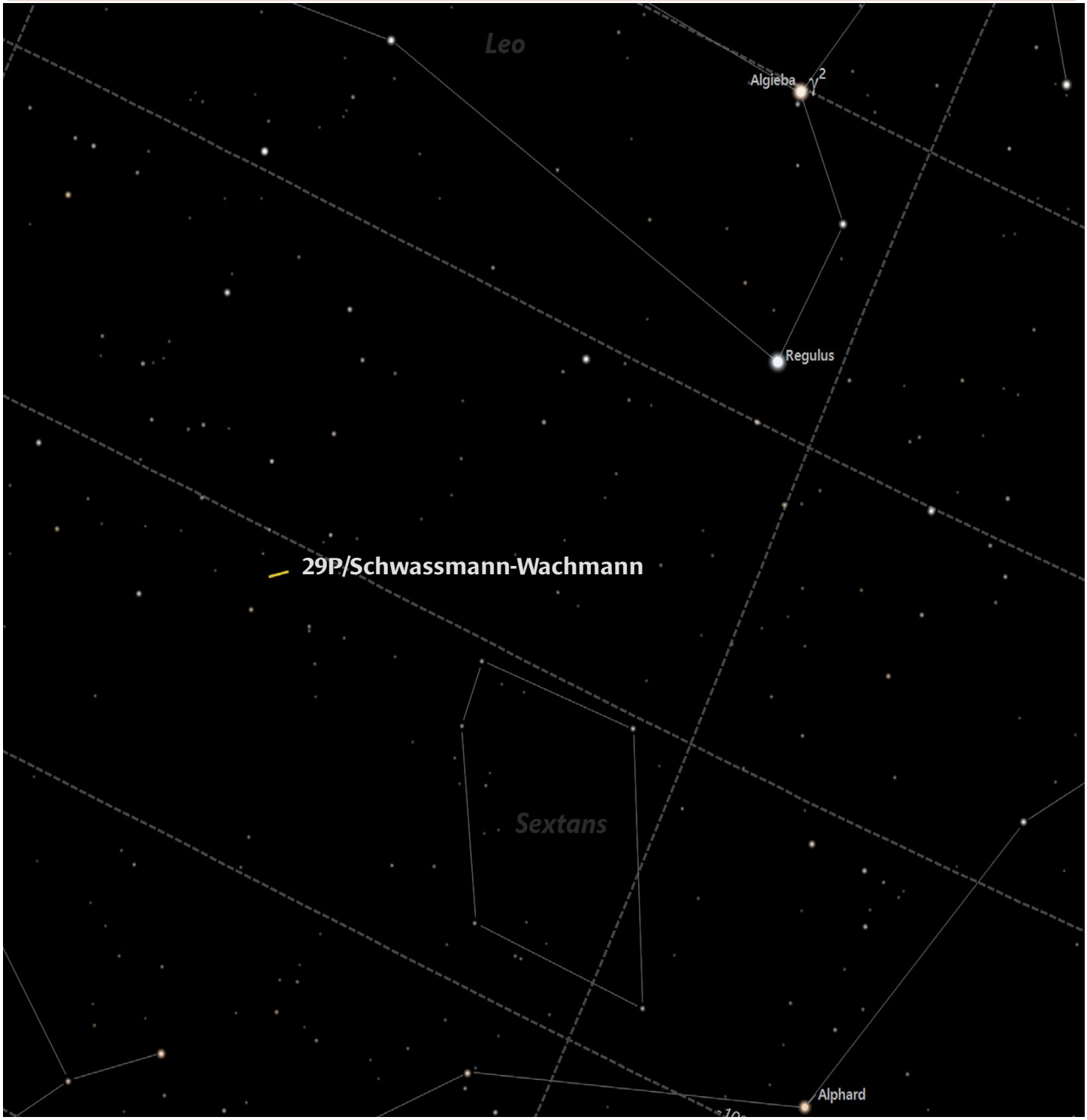
Meteor Showers in May

The Eta Aquarids meteor shower peaks on the night of May 5-6. Moon is only a few days past full and rises just after midnight. It would be best to look for them before then. . Debris from comet Halley's comet causes this shower. Expect to see fewer than 10 to 30 per hour.



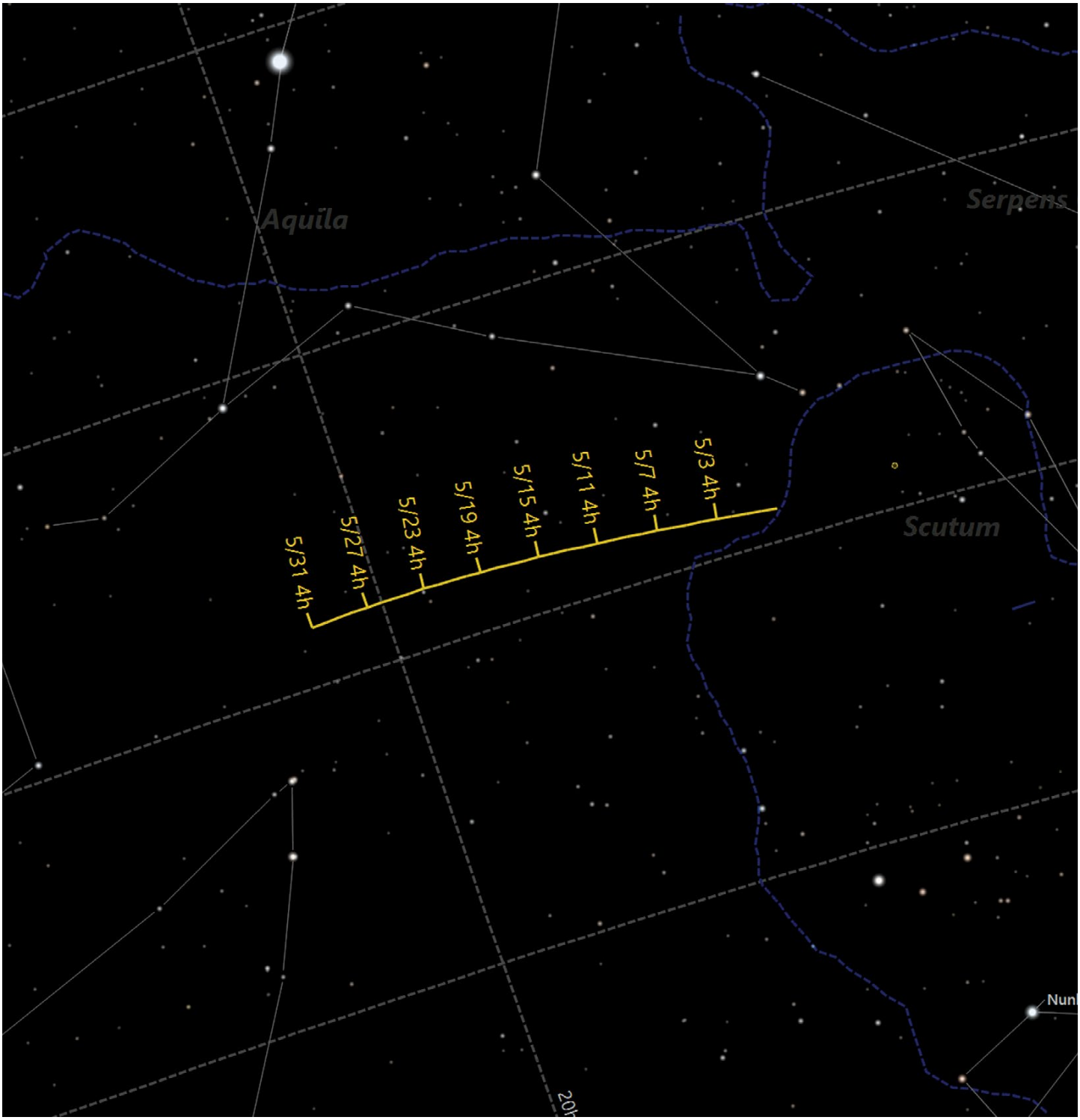
Europa , Jupiter, and GRS on April 20 at 8:08 pm by Vern Raben

29P/Schwassmann-Wachmann



Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
May 1	9:27 pm	11h01m04.1s	-01°14'28"	Leo	11.8	1.9
May 7	9:50 pm	11h00m32.5s	-01°08'01"	Leo	11.8	1.9
May 13	9:56 pm	11h00m22.2s	-01°03'28"	Leo	11.8	1.9
May 19	10:02 pm	11h00m33.0s	-01°00'57"	Leo	11.9	1.8
May 25	10:08 pm	11h01m04.7s	-01°00'31"	Leo	11.9	1.8
May 31	10:07 pm	11h01m56.6s	-01°02'09"	Leo	11.9	1.8

Comet 10P/Tempel



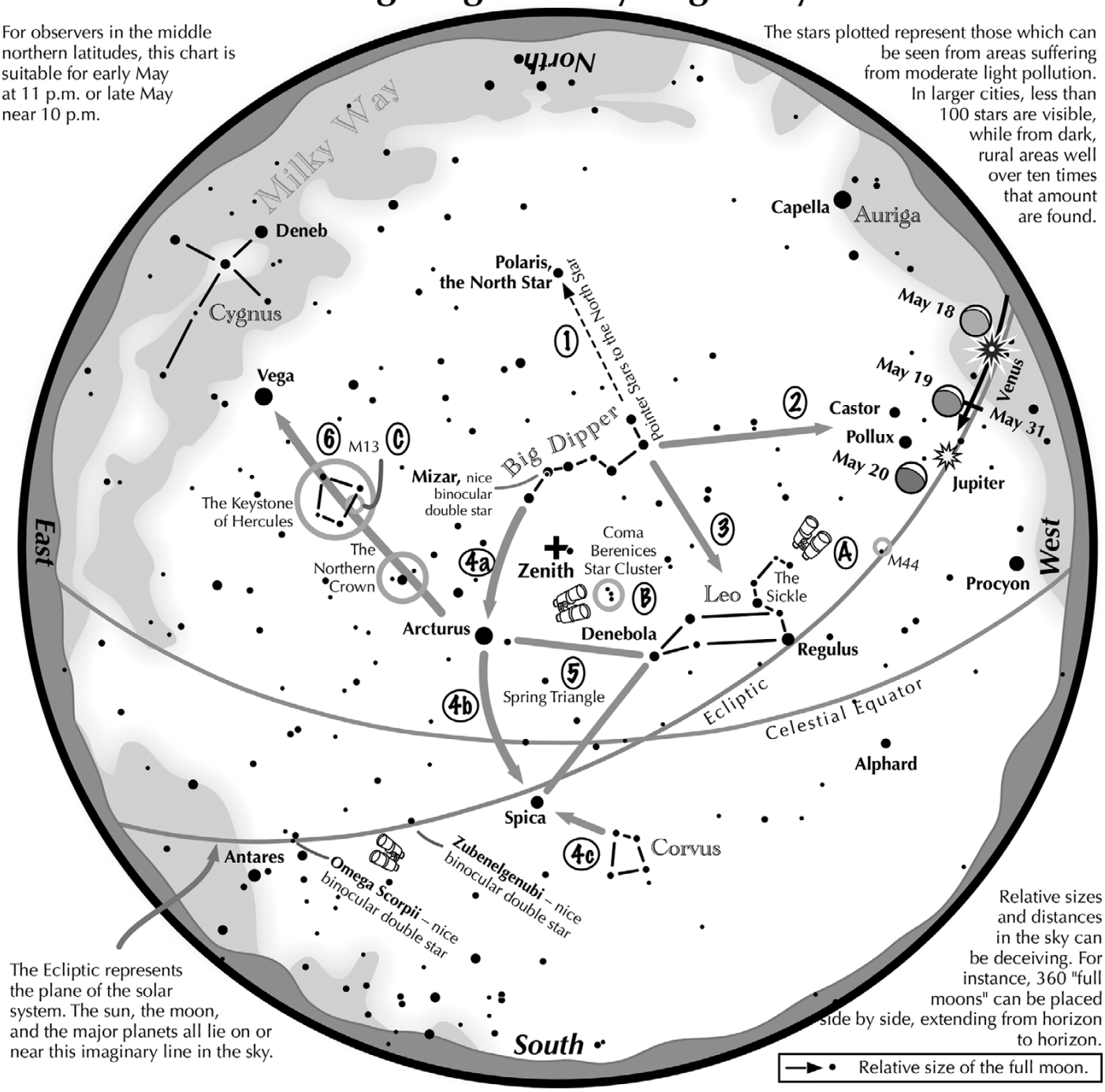
Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc sec)
May 1	Not visible					
May 7	4:01 am	19h27m36.6s	-08°29'54"	Aquila	14.3	43
May 13	3:57 am	19h39m00.8s	-08°15'31"	Aquila	14.0	46
May 19	3:49 am	19h50m18.9s	-08°05'59"	Aquila	13.6	50
May 25	3:42 am	20h01m31.2s	-08°03'11"	Aquila	13.2	53
May 31	3:46 am	20h12m38.7s	-08°09'04"	Aquila	12.9	57

Navigating the May Night Sky

2026

For observers in the middle northern latitudes, this chart is suitable for early May at 11 p.m. or late May near 10 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

Relative size of the full moon.

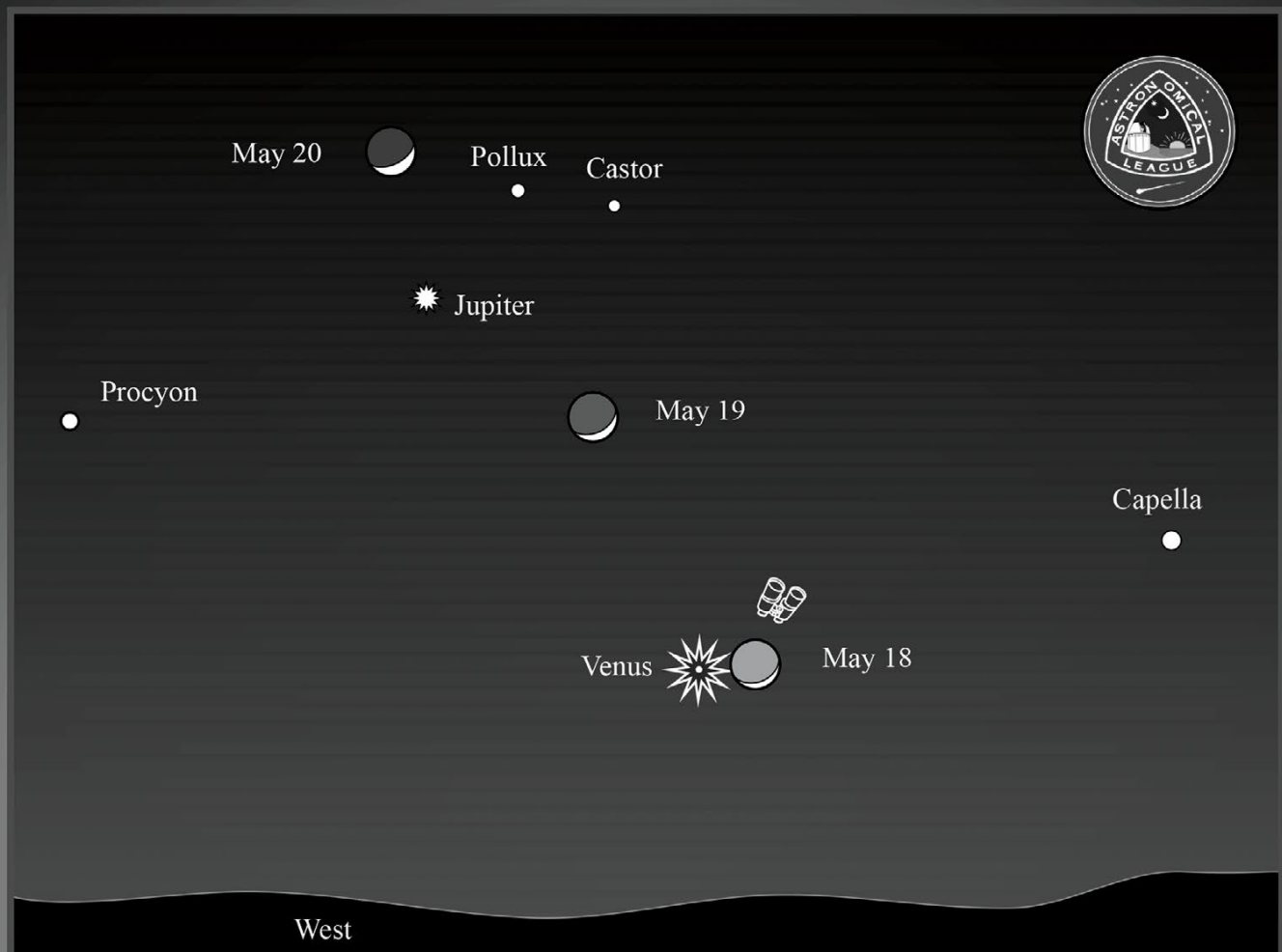
Navigating the May night sky: Simply start with what you know or with what you can easily find.

1. Extend a line northward from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
2. Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
3. Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
4. Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica. Confirm Spica by noting that two moderately bright stars just to its southwest form a straight line with it.
5. Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
6. Draw a line from Arcturus to Vega. One-third of the way sits "The Northern Crown." Two-thirds of the way hides the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.

Binocular Highlights

A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. **B:** Look near the zenith for the loose star cluster of Coma Berenices. **C:** M13, a round glow from a cluster of over 500,000 stars.

Astronomical League *www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.*



If you can see only one celestial event this month, see this one.

The crescent moon passing Venus then Jupiter

Look to the west-northwest 60 minutes after sunset on May 18, 19, and 20.

- On the first evening, the crescent moon full with earthshine glows immediately next to brilliant Venus.
- The next evening finds a somewhat thicker crescent moon sitting midway between Venus and Jupiter.
- On May 20, the moon lies above Jupiter and in a line with Castor and Pollux.
- The bright stars Capella and Procyon act as boundaries helping frame the scene.

End your day with this magical scene!

LAS April Meeting Notes by Eileen Hall-McKim

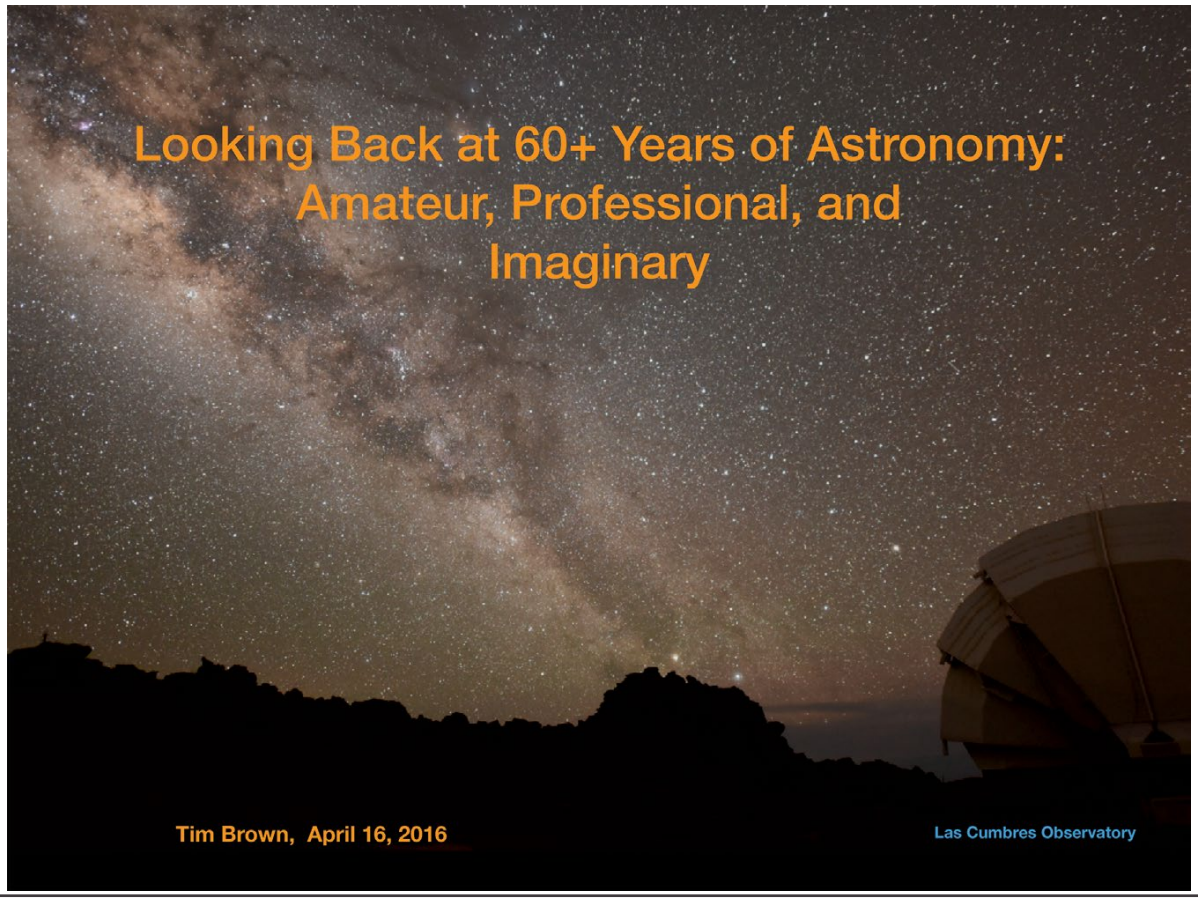
I. Introduction

Our LAS April meeting was held in-person and by zoom on April 16th at the Longmont Evangelical Lutheran Church, 803 Third Ave. President, Vern Raben began the meeting with self-introductions of those attending in person and on-line. Thirty-seven attended in person, 6 attended on-line.

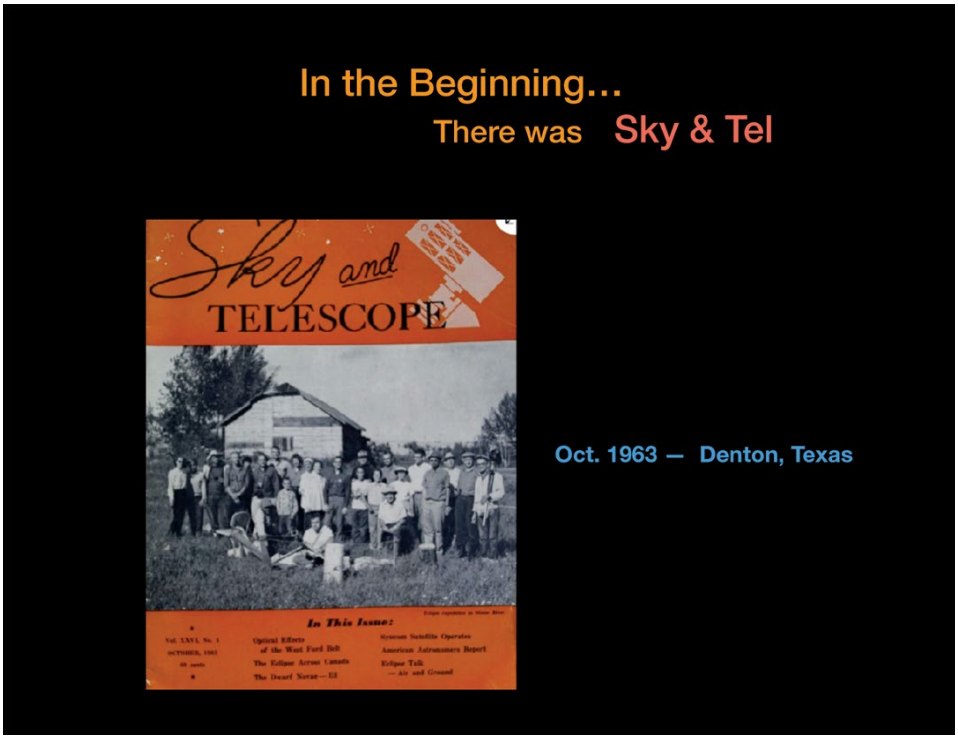
II. Main Presentation

Our speaker for this evening is Dr. Tim Brown. Tim has been a long-time LAS member. He has designed and built telescopes since he was a teenager, and has posted some excellent lunar images taken with his 10 inch schiefspiegler (which he designed and built). We know him as a knowledgeable and skilled amateur astronomer but may not know about his long and distinguished career in astrophysics.

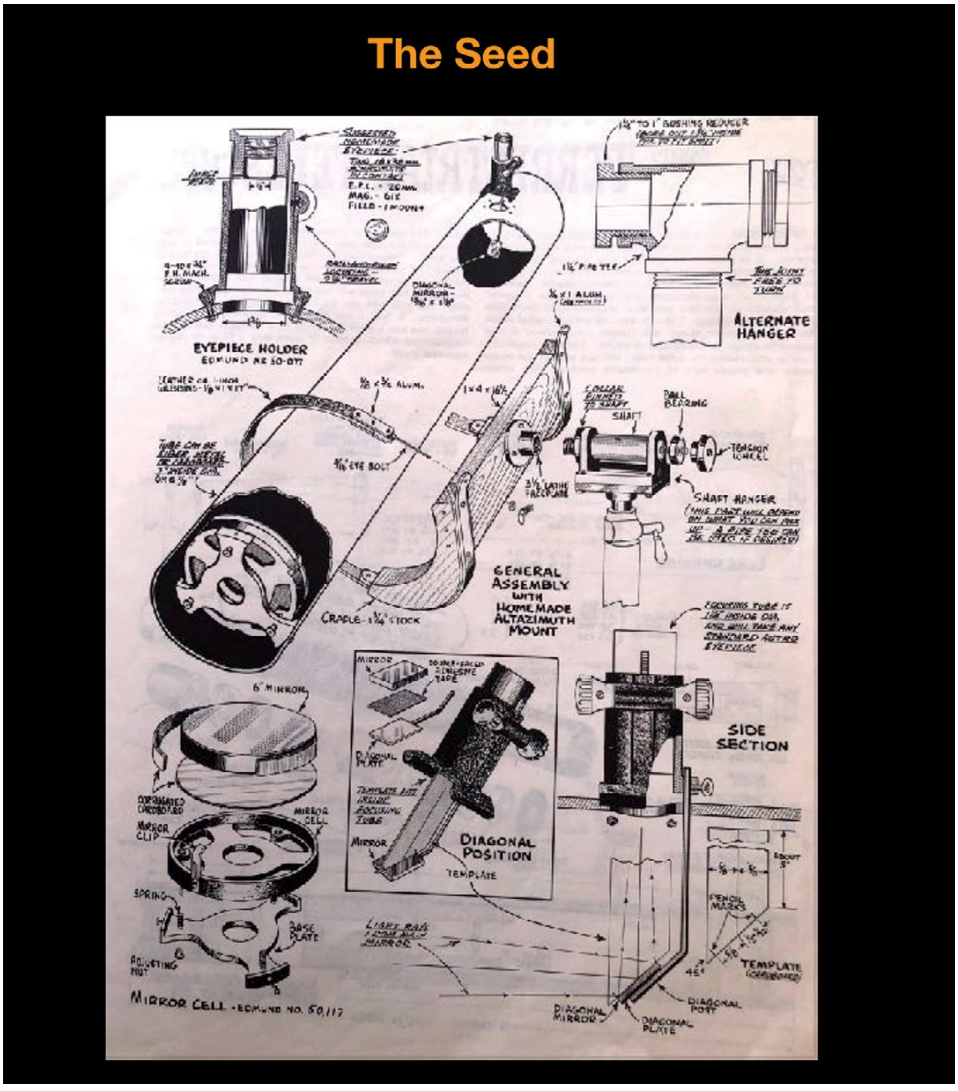
He earned his Ph.D. in astrophysics from the University of Colorado Boulder after undergraduate studies at Wesleyan University. He spent over 25 years at the High Altitude Observatory (a division of the National Center for Atmospheric Research, NCAR) before joining Las Cumbres Observatory Global Telescope Network (LCOGT) in 2005 as its first Scientific Director (later serving as Principal Scientist). He has held adjunct or adjoint professor roles affiliated with CASA and the Department of Astrophysical, Planetary, and Atmospheric Sciences at CU Boulder, as well as at the University of California, Santa Barbara.
His major contributions include pioneering work in helioseismology (developing the Fourier Tachometer method), asteroseismology, and exoplanet research. Notably, he and David Charbonneau detected and characterized the first transiting exoplanet (HD 209458b), and he helped develop techniques for studying exoplanet atmospheres that are now widely used. He was an early member of the Kepler science team and has developed several instruments, including the STARE telescope. In 2016, he received the James Craig Watson Medal from the National Academy of Sciences for his advancements in these fields and his support for new scientists and facilities. (See https://lco.global/news/dr-tim-brown-to-receive-distinguished-watson-medal/).



"Looking Back at 60+ Years of Astronomy: Amateur, Professional, and Imaginary"
By Dr. Tim Brown

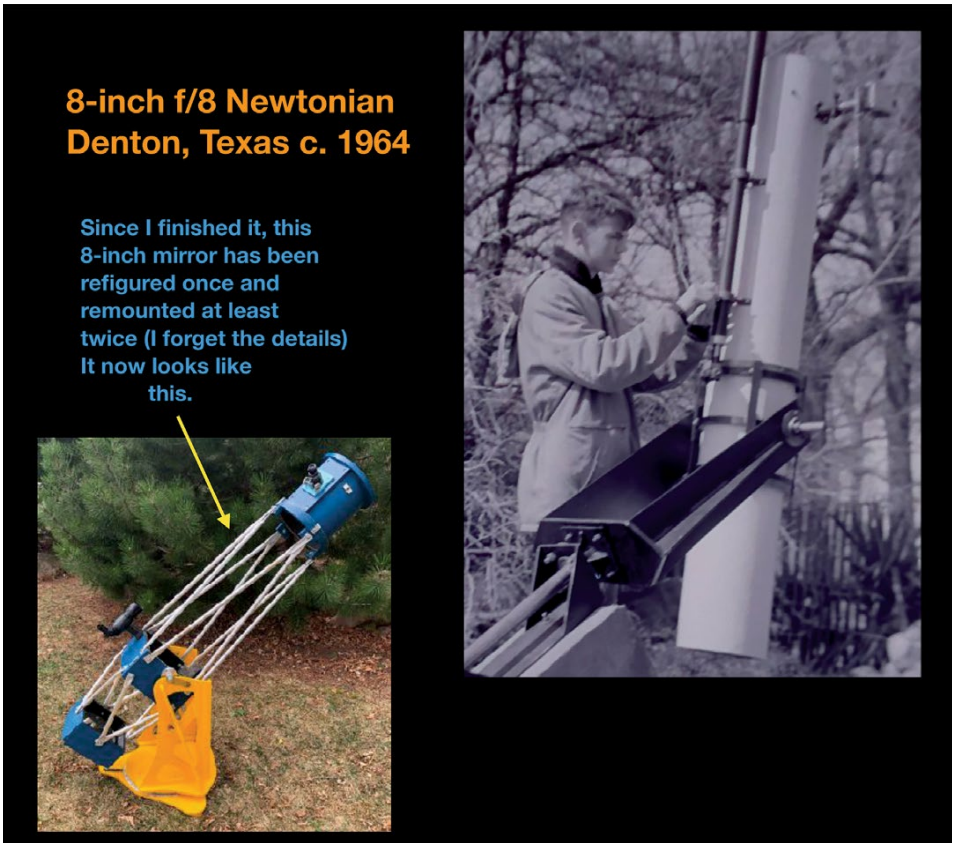


In the Beginning there was Sky & Telescope – October, 1963 – Denton, Texas
Got interested in astronomy as a child of Sputnik, reading his brothers science fiction, Dad started bringing home Sky & Telescope; "Fun With Optics" from the library



The Seed was planted – Edmund Scientific – " Fun With Optics" Sam Brown, ed.

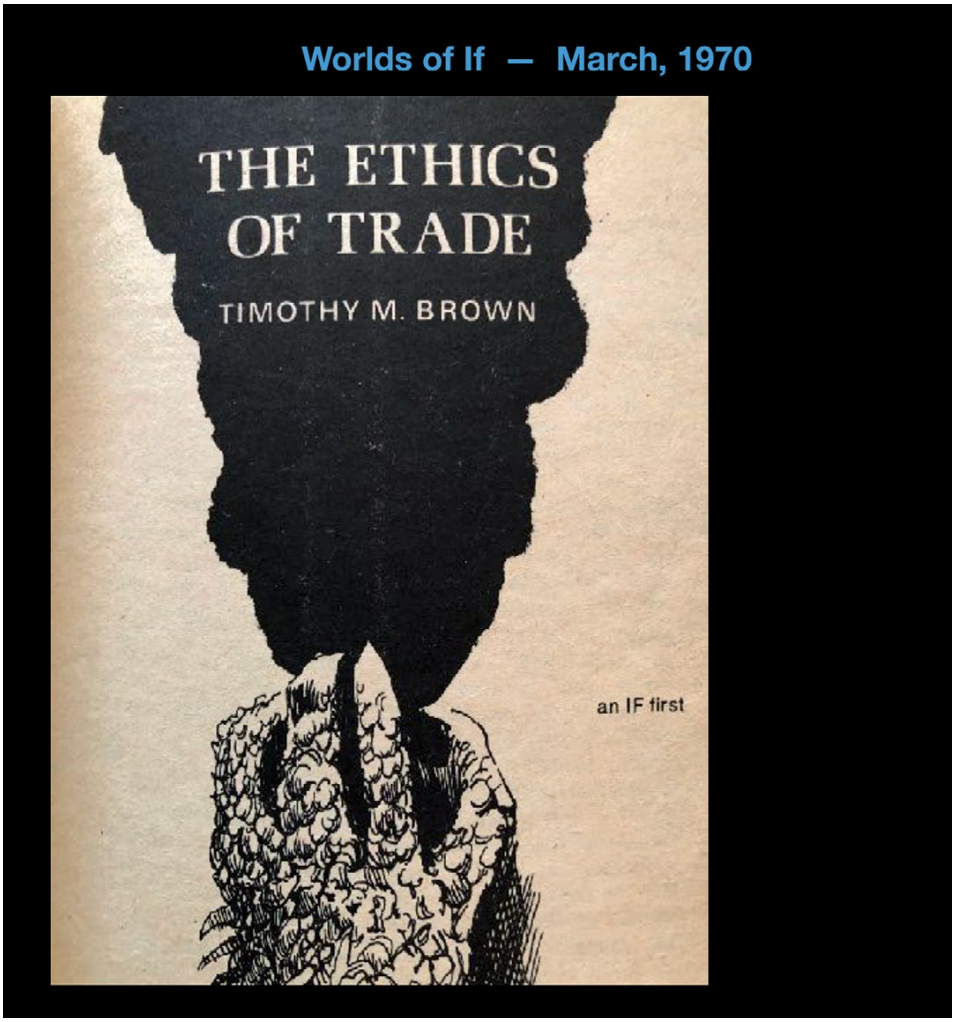
Saw plans for a 6" telescope thought "Wow that doesn't look that hard to build"



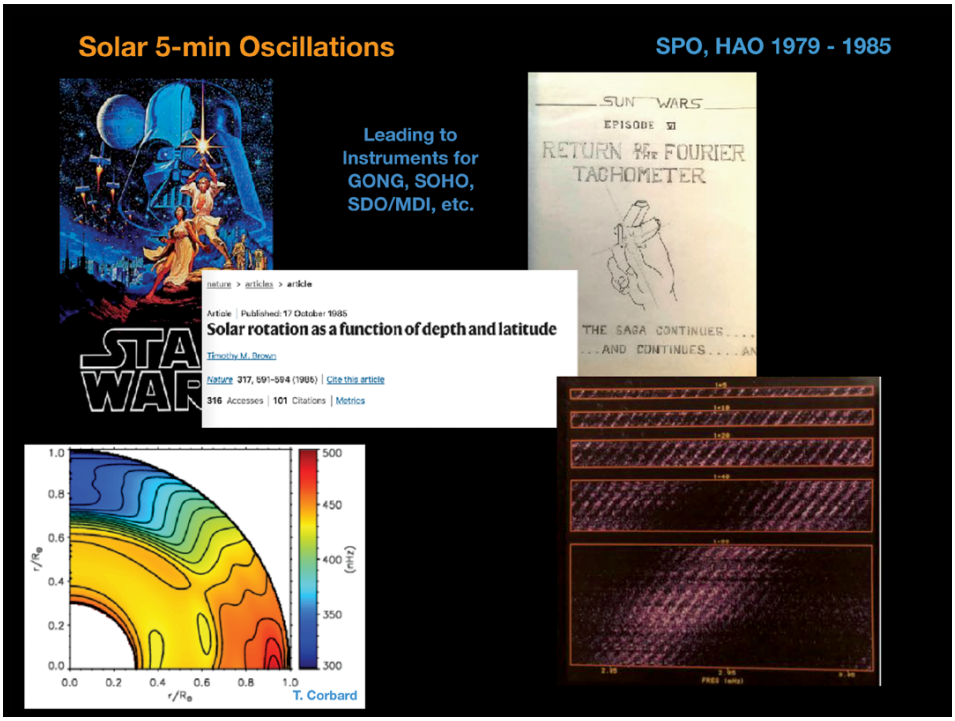
Tim with his first telescope he built, 8' f/8 Newtonian, Denton, Texas c. 1964

Robert E. Cox
4.25" f/4 compact Field-rich Newtonian – 1967

Parents moved to Illinois, Tim started taking courses on Astronomy at basement of planetarium run by Robert E. Cox - readings for ATM – Amateur Telescope Making; Robert holding 3.5" folding telescope he built; inspired Tim to build his second telescope.



Tim came from a literary family – he was interested in writing, his first publication "The Ethics of Trade" about company that indulges in profiteering and callous disregard for public safety

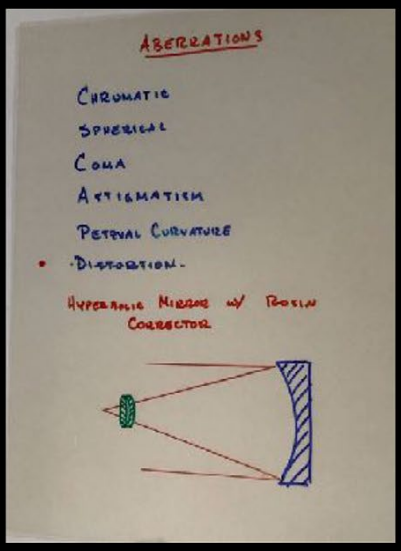


Went off to College, Graduate School

He and colleagues got measurements of rotation of Sun in depth and latitude, Sun rotates at different speeds at different places; differential rotation of equator; poles depending depth

Article published 17 October 1985; Solar rotation as a function of depth and latitude; *Nature* **317**, 591-594

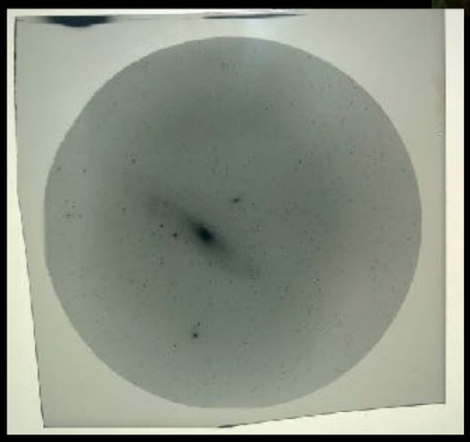
Rosin Telescope



Basic design from Seymour Rosin, 1961.

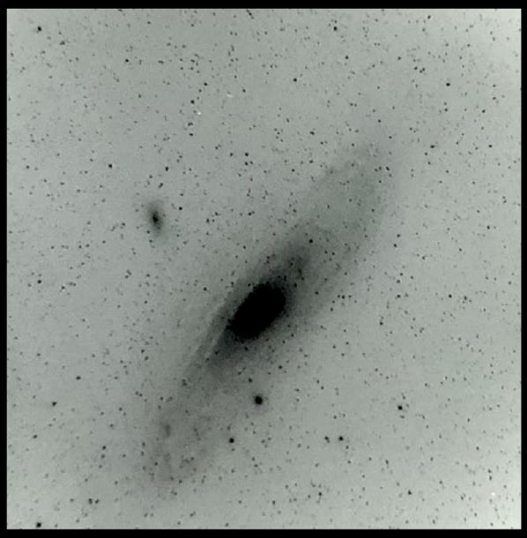
My version is 6-inch f/3.5 c. 1989 FOV is 3 deg circle on 2 x 2 inch film.

Similar to original Takahashi hyperbolic astrograph



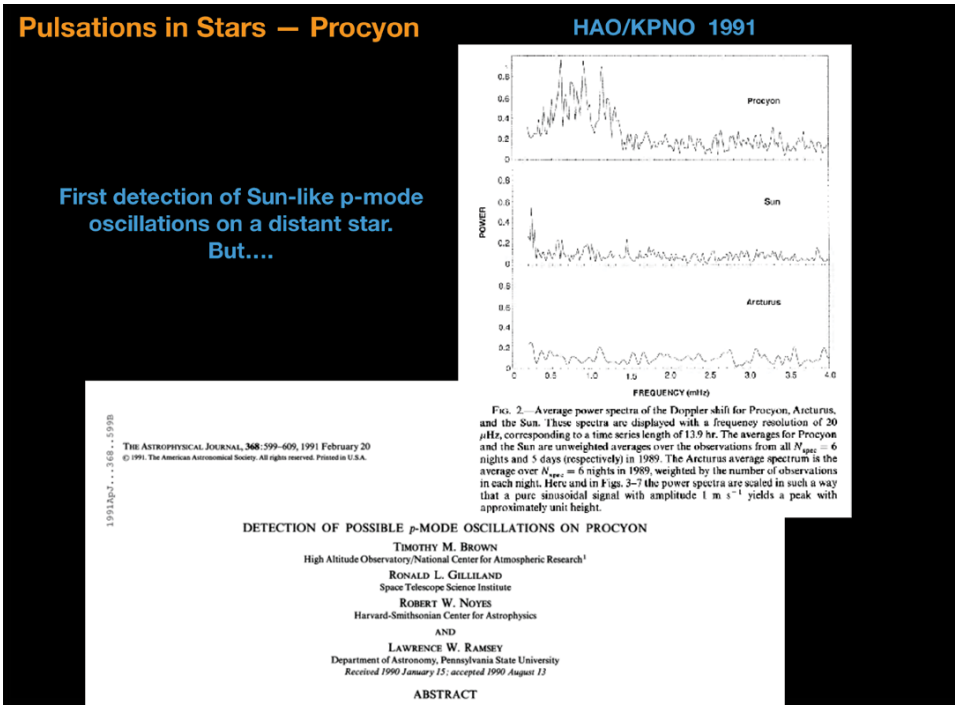
Daughter Andrea With complete system, c. 1992

Fun with Rosin



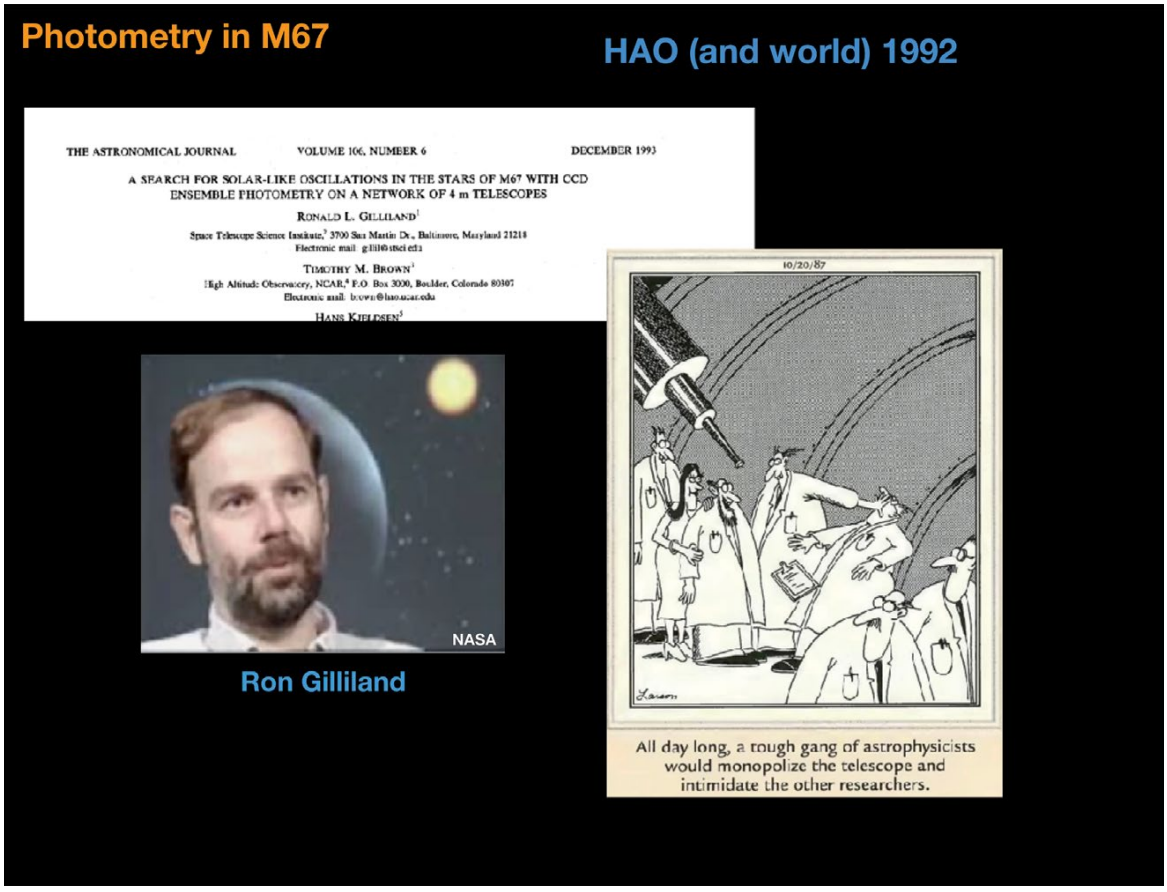
Deadman site, c. 1989

Amateur astronomy still went on as Tim built another telescope seen with daughter Andrea, it made images on photographic film. Image of Andromeda Galaxy for idea of field of view– Deadman Site, Northern Colorado c. 1989

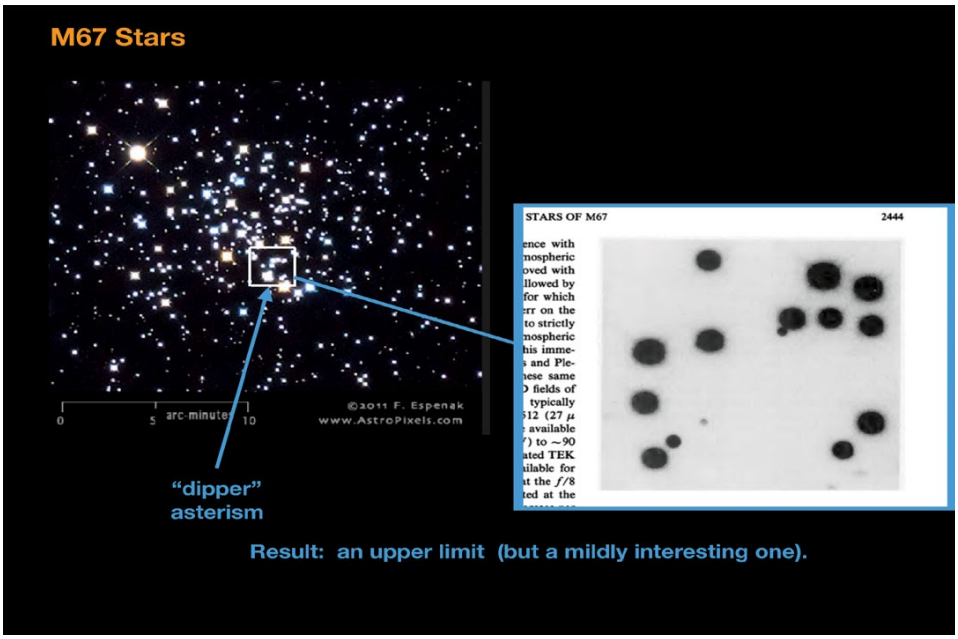


Pulsations in Stars – Procyon - In 1999, Went to Kitt Peak Observatory with others for 5 nights, got first measurement p-mode oscillation on the sun-like star, BUT not all colleagues convinced; took 10 years to get data pristine enough (because it was taken from space) to convince them.

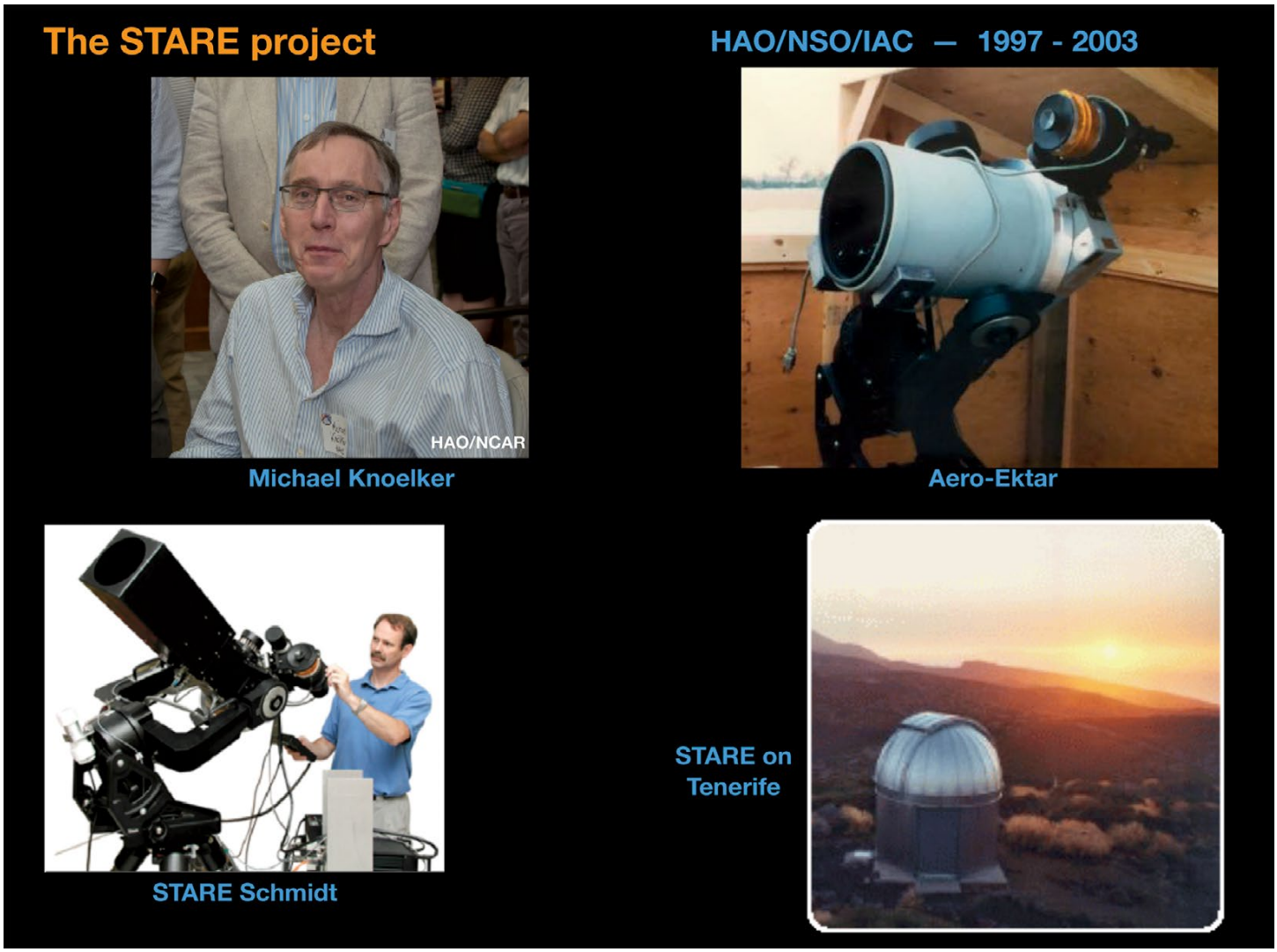
Published – Detection of Possible *p*-mode Oscillations on Procyon; The Astrophysical Journal, **368**: 599-609, 1991 February 20



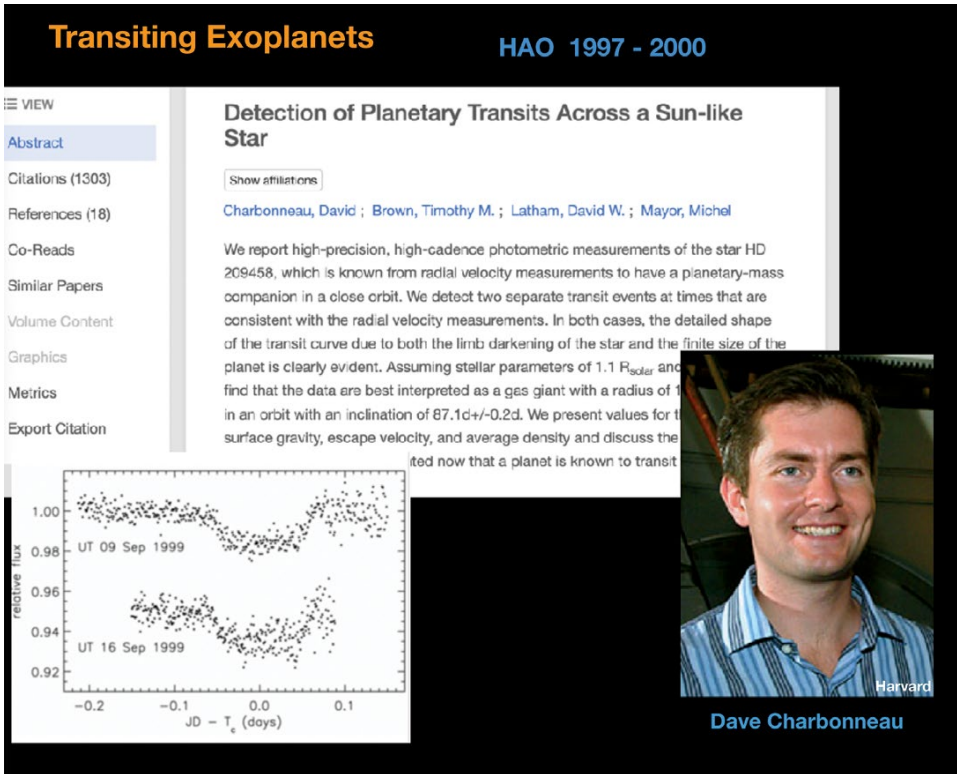
Photometry in M67 Ron Gilliland set up network of 4 m telescopes
Published: A Search for Solar-Like Oscillations In The Stars Of M67 With CCD Ensemble Photometry On A Network Of 4 m Telescopes; The Astronomical Journal; Volume 106 Number 6 December 1993



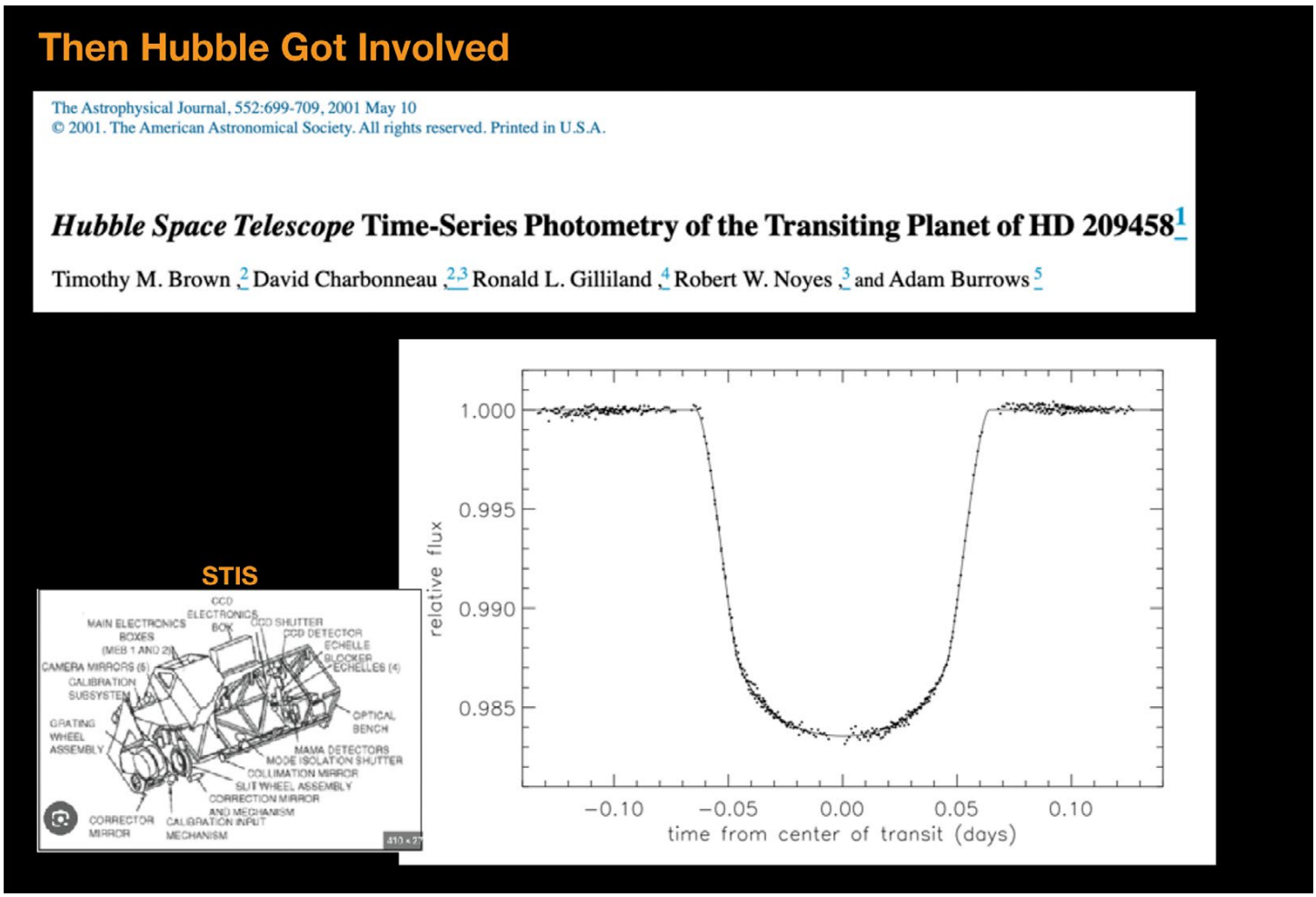
M67 Star Cluster - We were able to find solar region call "The Dipper" contains 13 stars about the size and temperature of the Sun, concluded we would be able to measure pulsations using all the other stars- "cluster photometry" result was upper limit but not pulsations, but all this helped convince it would be possible to look for transiting planets with telescopes on the Earth!



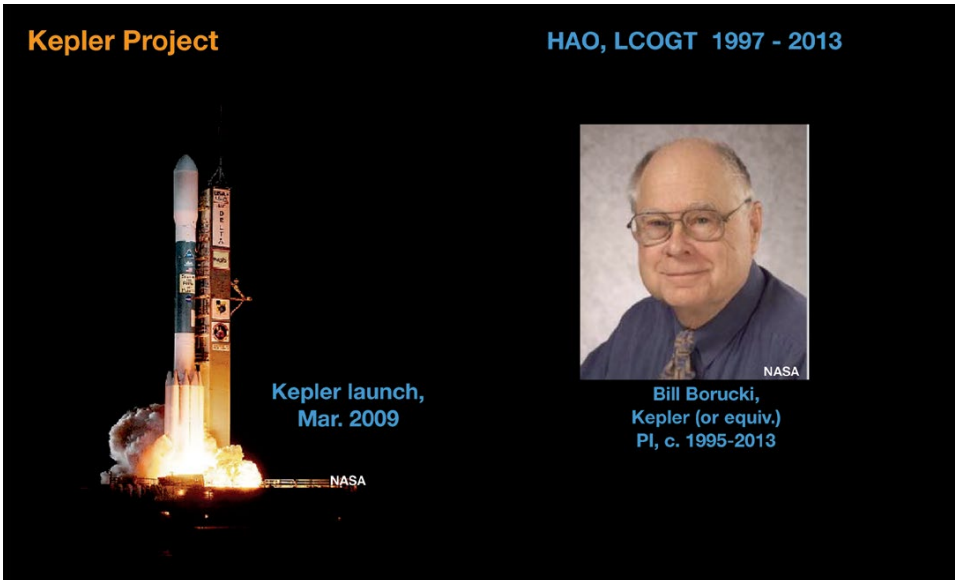
The STARE Project (STellar Astrophysics & Research on Exoplanets) uses precise time-series photometry to search for extra-solar giant planets transiting their parent stars. Tim and others spent time at the STARE instrument at the "Observatorio del Teide" in Tenerife, Canary Islands



Transiting Exoplanets High Altitude Observatory – Tim's paper with Dave Charbonneau et.al.
Lightcurve plotted of planetary transits across star.
Published: "Detection of Planetary Transits Across a Sun-like Star", most cited paper (1300)

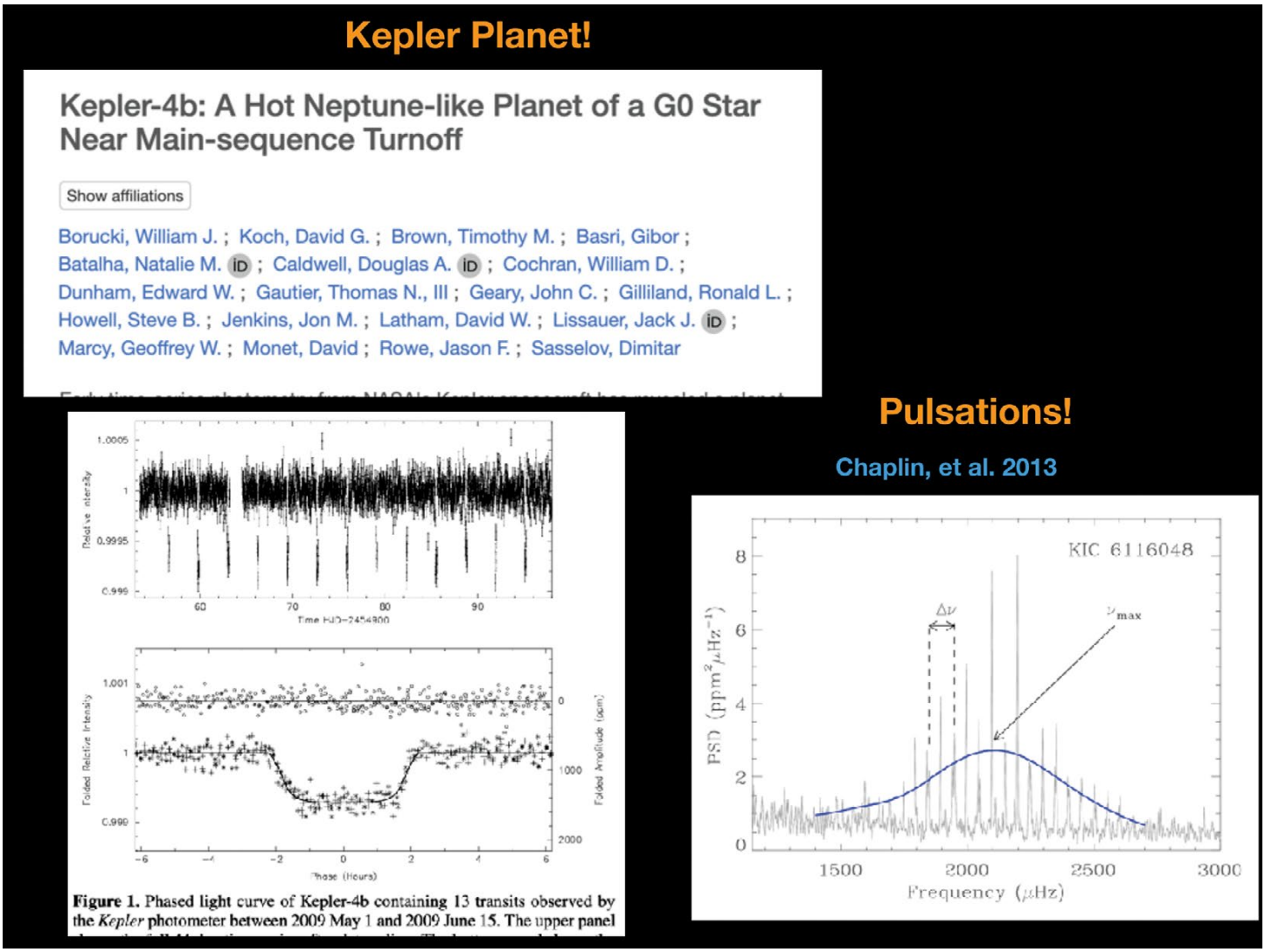


Published: Hubble Space Telescope Time-Series Photometry of the Transiting Planet of HD 209458; The Astronomical Journal, 552:699-709, 2001 May 10

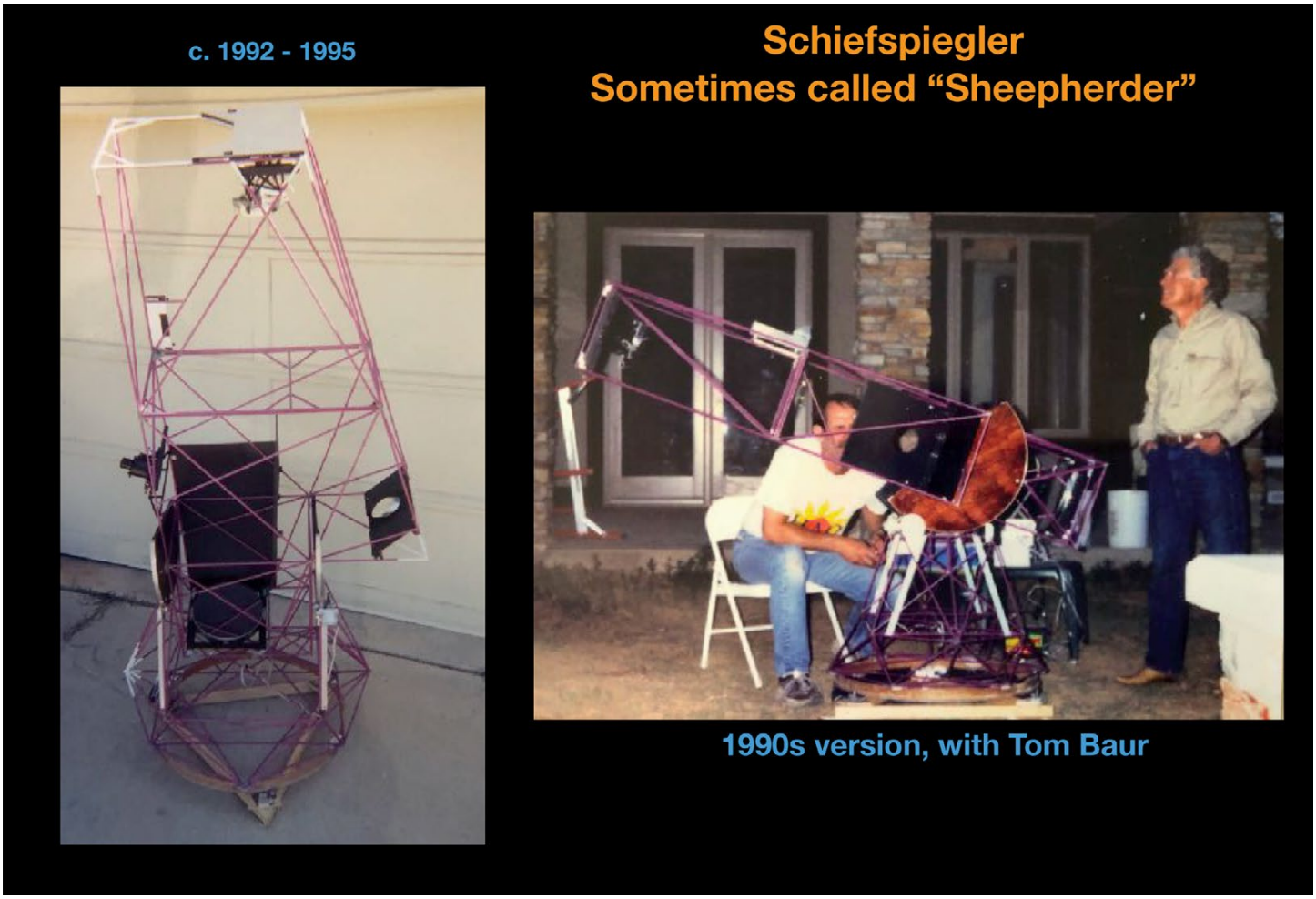


Kepler Project –
Bill Borucki Kepler PI

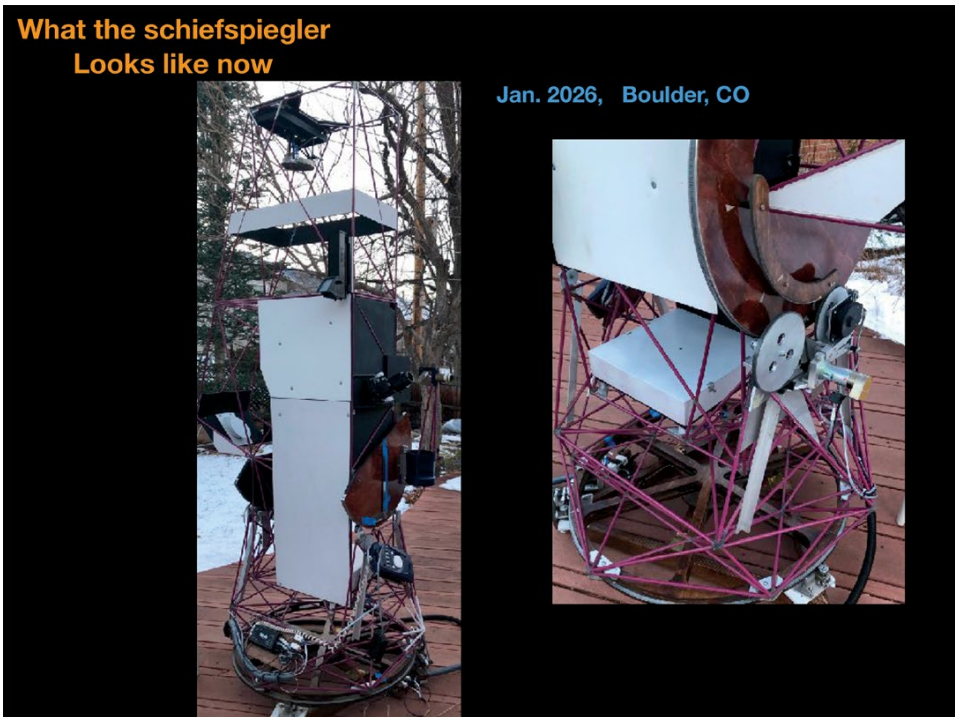
Launched March 2009, the Kepler space telescope combined cutting-edge techniques in measuring stellar brightness. Kepler detected planets by observing transits, or tiny dips in the brightness of a star that occur when a planet crosses in front of the star. The telescope developed a defect but was repurposed and still used to discover another 4,000 or so planets.



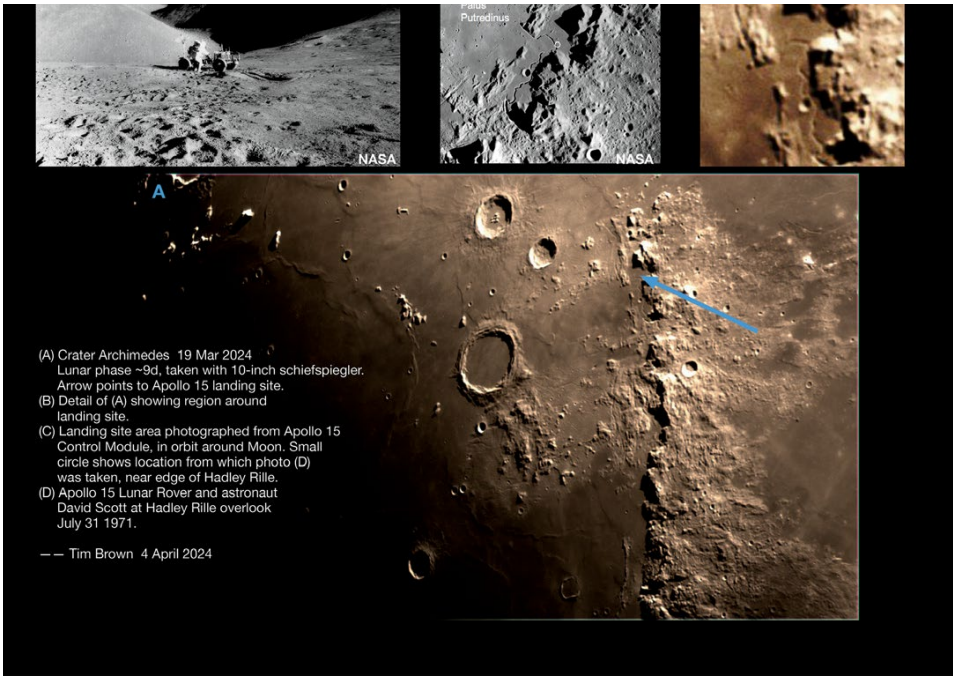
Kepler Planet
Published: Kepler -4-b: A Hot Neptune-like Planet of a G0 Star near Main-Sequence Turnoff



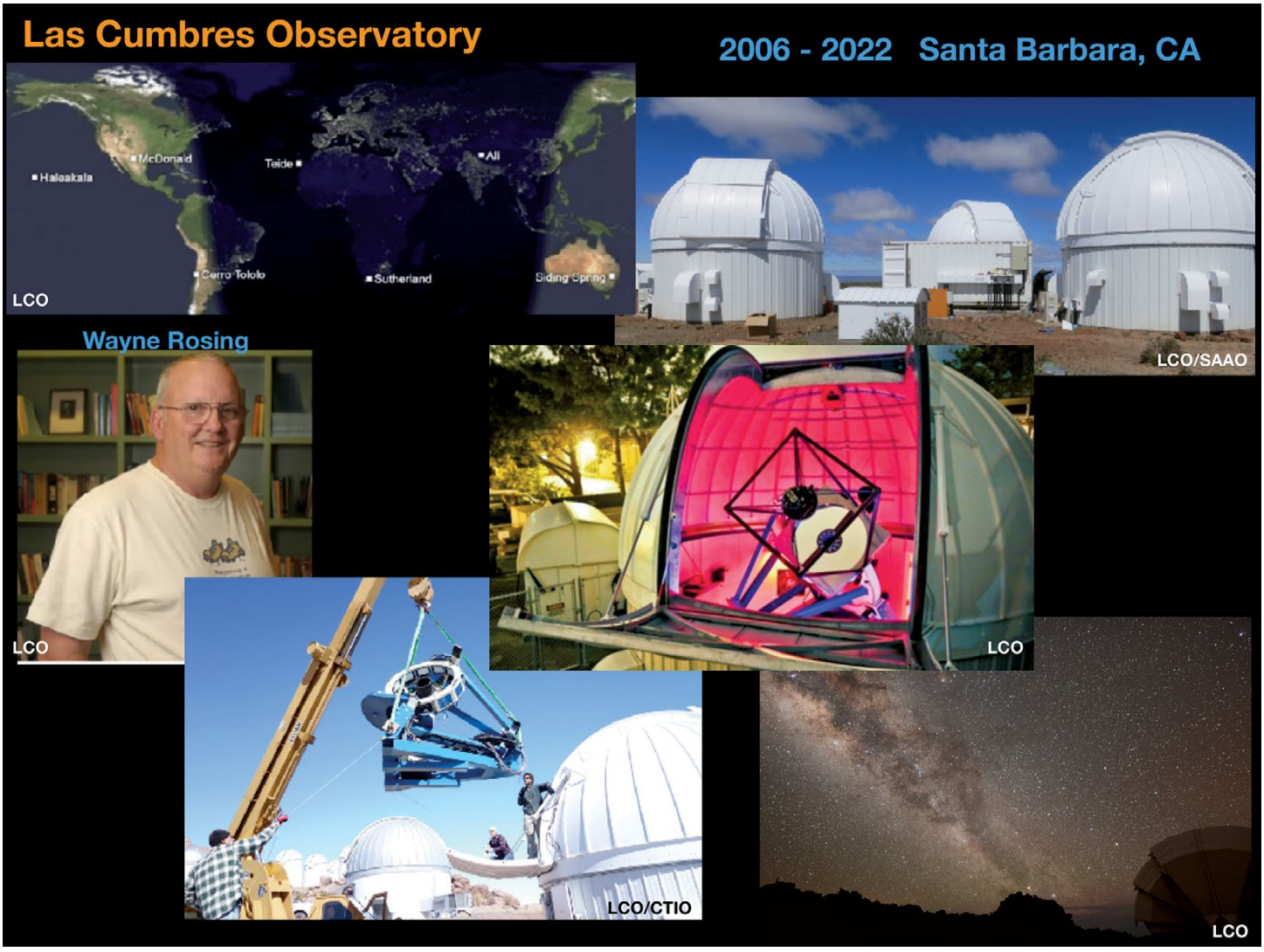
Tim Brown's Schiefspiegler (named for optical design) – Sometimes called "Sheepherder" (1990s Version)



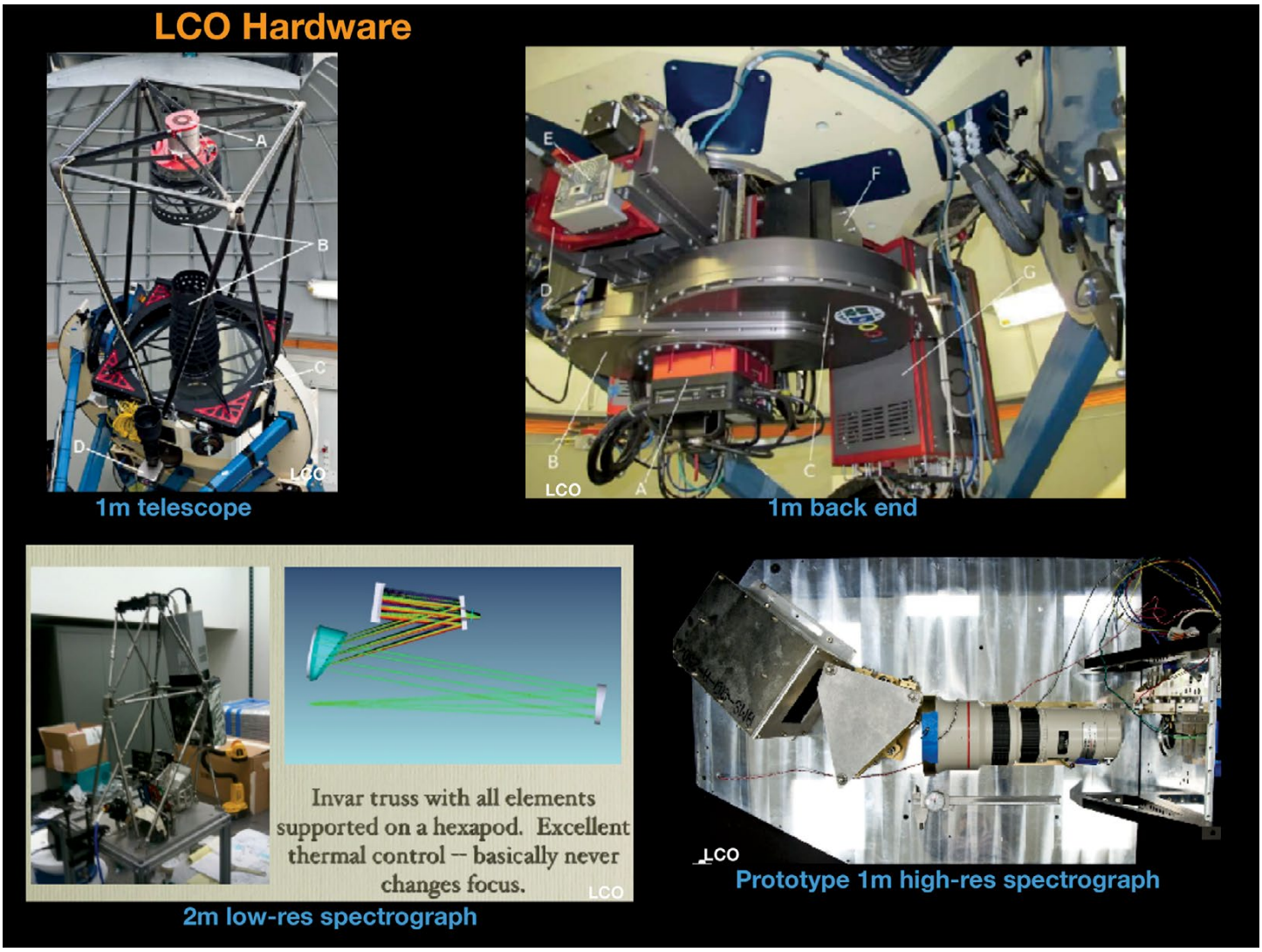
What the Shiefspiegler looks like now



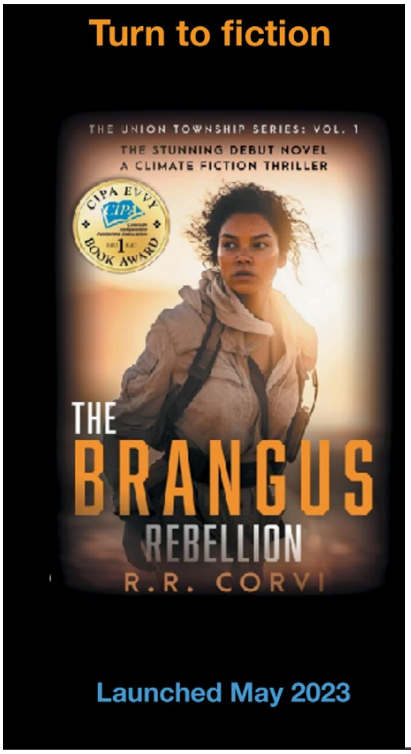
Tim Brown's Lunar Images taken by the Shiefspiegler – March 19, 2024



Went to work with Wayne Rosing at Las Cumbres Observatory 2006-2022 Santa Barbara, CA – built with idea to run robotic telescopes remotely scattered around the world to be able to see whole sky anytime as long as it is clear



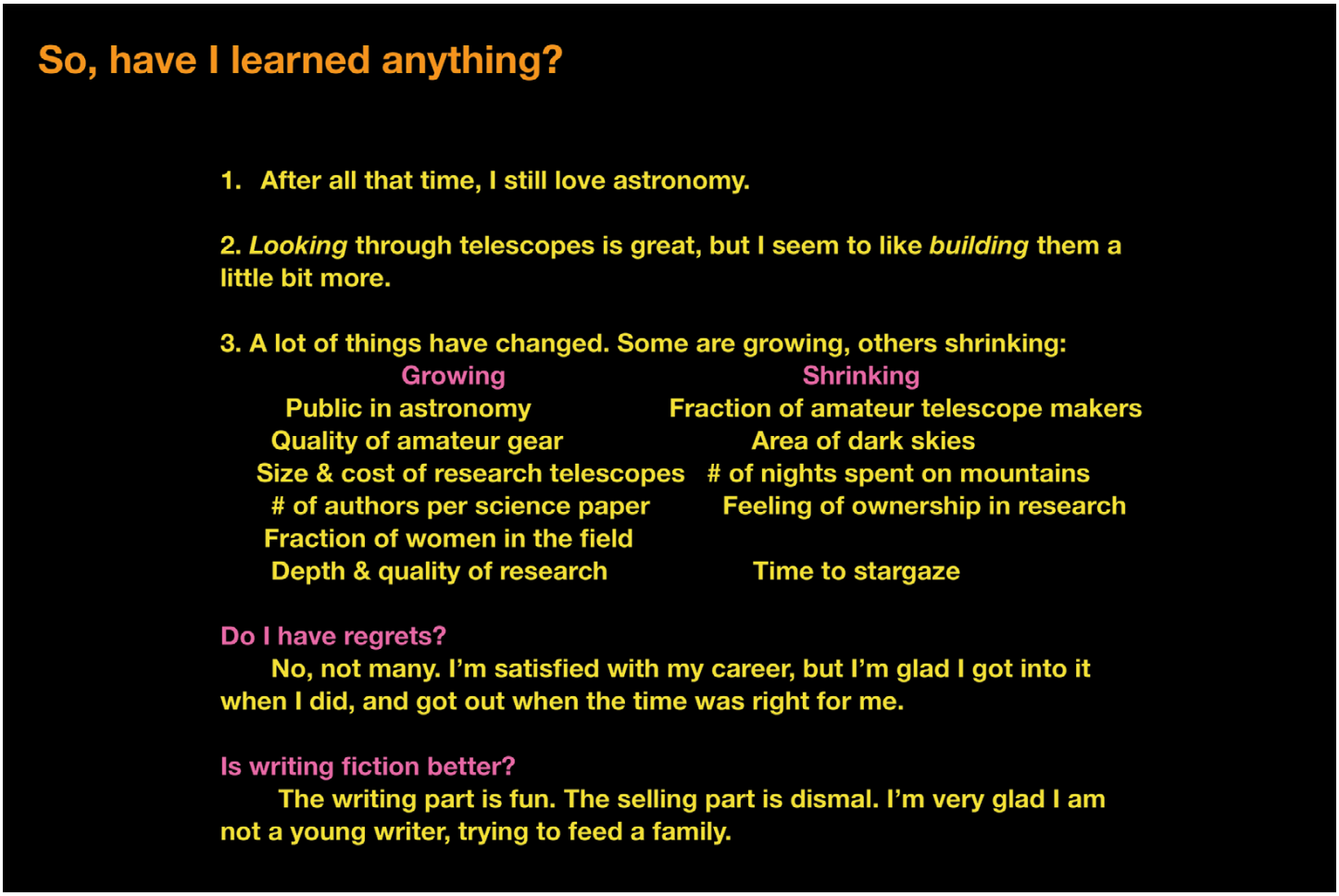
Las Cumbres Observatory Hardware



Tim retires and returns to one of his favorite pastime – writing fiction Pen name = R.R. Corvi
Published: The Brangus Rebellion May, 2023 – A science fiction based story that future Earth has a climate-forced collapse that kills almost everybody; survivors seek to build a society in which that can never happen again.

Sequels to The Brangus Rebellion Tim is working on with some of same characters:

- Sibs Underground
- The Sibs War



What have I learned?

IV. Upcoming Events by Aref Nammari – Outreach Coordinator

- Next LAS Meeting: May 21st 7:00 pm with guest speaker Dr. Tim Wirth

- Rabbit mountain with BOCO Open Space the star party is on Friday May 15, from 7:45 - to 10:15 PM (LAS volunteers with telescopes can stay later). Plan to set up early: sunset is at about 8:10 PM and it does not get dark until about 30 minutes later.
- Beech Shelter with City of Boulder Open Space star party is on Wednesday May 13 from 8:00 - 10:00 PM. Plan to come early as the parking space is small and gets filled up pretty quickly. Registration is at https://volunteer.bouldercolorado.gov/event/853984?register=true (LAS members bringing telescopes do not need to register)
- BOCO Open Space Volunteer Learning Opportunity Rabbit Mountain. Tuesday May 19 from 8:00 - 10:30 PM. This is an event that is not open to the public and is for learning opportunities for BOCO volunteers. LAS was invited to give a presentation about Astronomy (no specific topic but general). I and hopefully other LAS members can join and give a talk about various aspects of astronomy: observing and astrophotography or simply join and bring telescopes for star gazing opportunity. Please contact me directly if you are interested in presenting or bringing a telescope.

  Aref Nammari -- LAS outreach coordinator

III. Business Meeting with Treasurer Bruce Lamoreaux

Longmont
Astronomical Society

P.O. Box 806
Longmont, CO 80502-0806

LAS Treasurer's Report - Bruce Lamoreaux **4/16/2026**

Main Checking Account (xxx-1587)

Begin Balance:	$ 4,845.00	**3/3/2026**	
Deposits:	$ 150.00	Membership	
Expenses:	$ (12.00)	Bank Charges	
Current Balance:	**$ 4,983.00**	**4/2/2026**	

2-Year Savings Account (xxx-1478) (matures 10/23/25)

Past Balance:	$ 8,325.00	**12/31/2025**
Interest:	$ 15.00	
Balance:	**$ 8,340.00**	**3/31/2026**

Telescope Fund (xxx-0165)

Past Balance:	$ 1,090.00	**2/26/2026**
Deposits:	$ -	
Expenses:	$ -	
Balance	**$ 1,090.00**	**3/30/2026**

Petty Cash

Past Balance:	$ 50.00
Deposits:	$ -
Expenses:	$ -
Balance	**$ 50.00**

Total Assets	**$ 14,463.00**	$ 154.00	Up From March

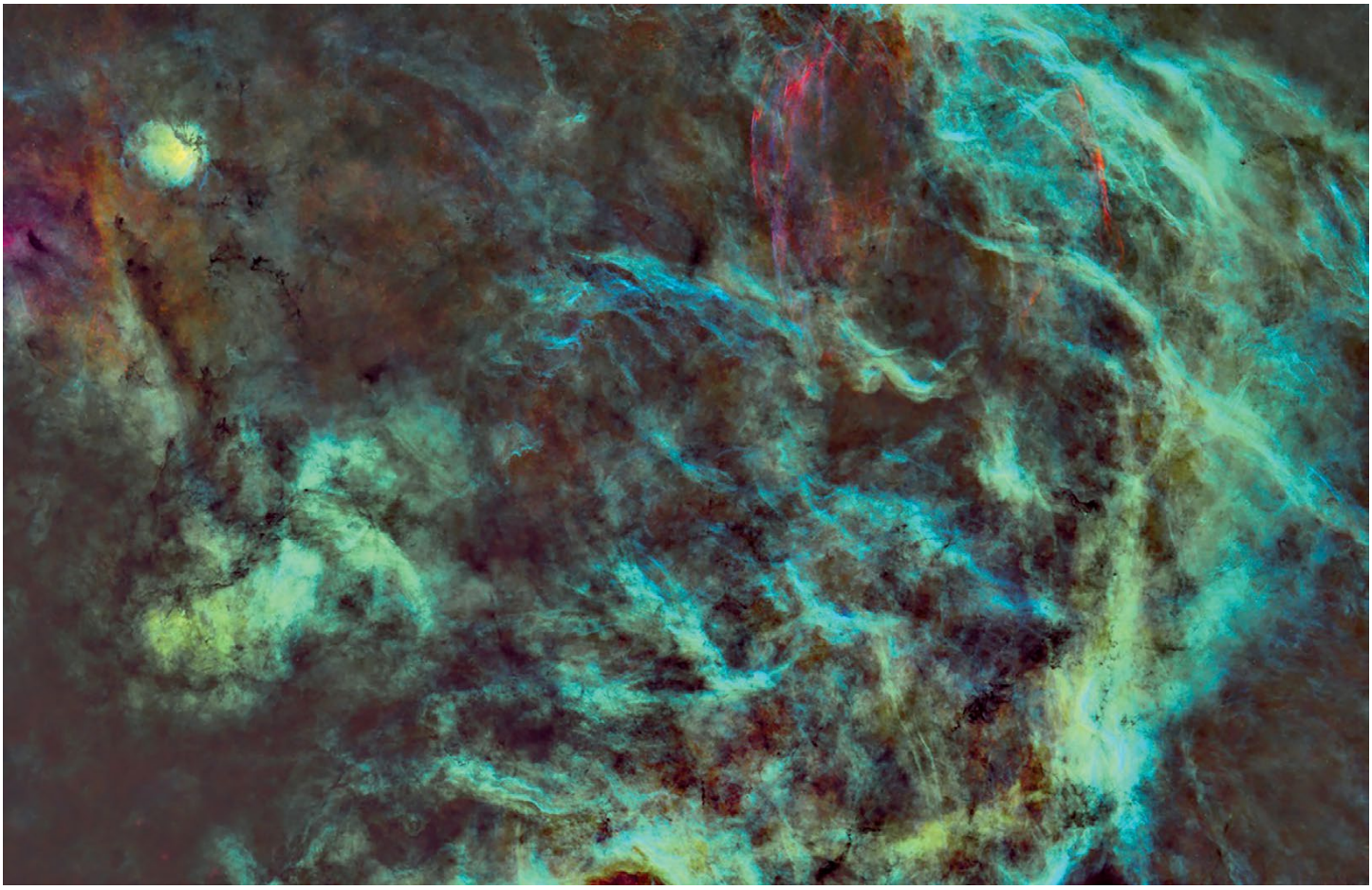
Active Membership:	**108**	
Student Membership:	**2**	
Total	**110**	Active

Sharpless 2-112: Astro-Art in Cygnus by David Elmore

Here is a field in Cygnus captured in narrowband. Colors were chosen to bring out atomic species, but the result could be interpreted as a piece of abstract art.
Oxygen III is depicted as red and reveals a supernova remnant in the upper right. The star-forming region Sharpless 2-112 shows up in Hydrogen shown as blue and Sulfur II shown as green in the upper left. The entire field is filled with molecular clouds many of which are the product of stars that have lived their lives sending gas back out into the galaxy often through supernova explosions. This is the star stuff of which we are made.

Borg107 refractor, ASI6200mm camera, Chroma Ha, OIII, and SII filters, iOptron CEM70G mount. About 6 hours total exposure from my little observatory at Dark Sky New Mexico.

David



M82 by Gary Garzone

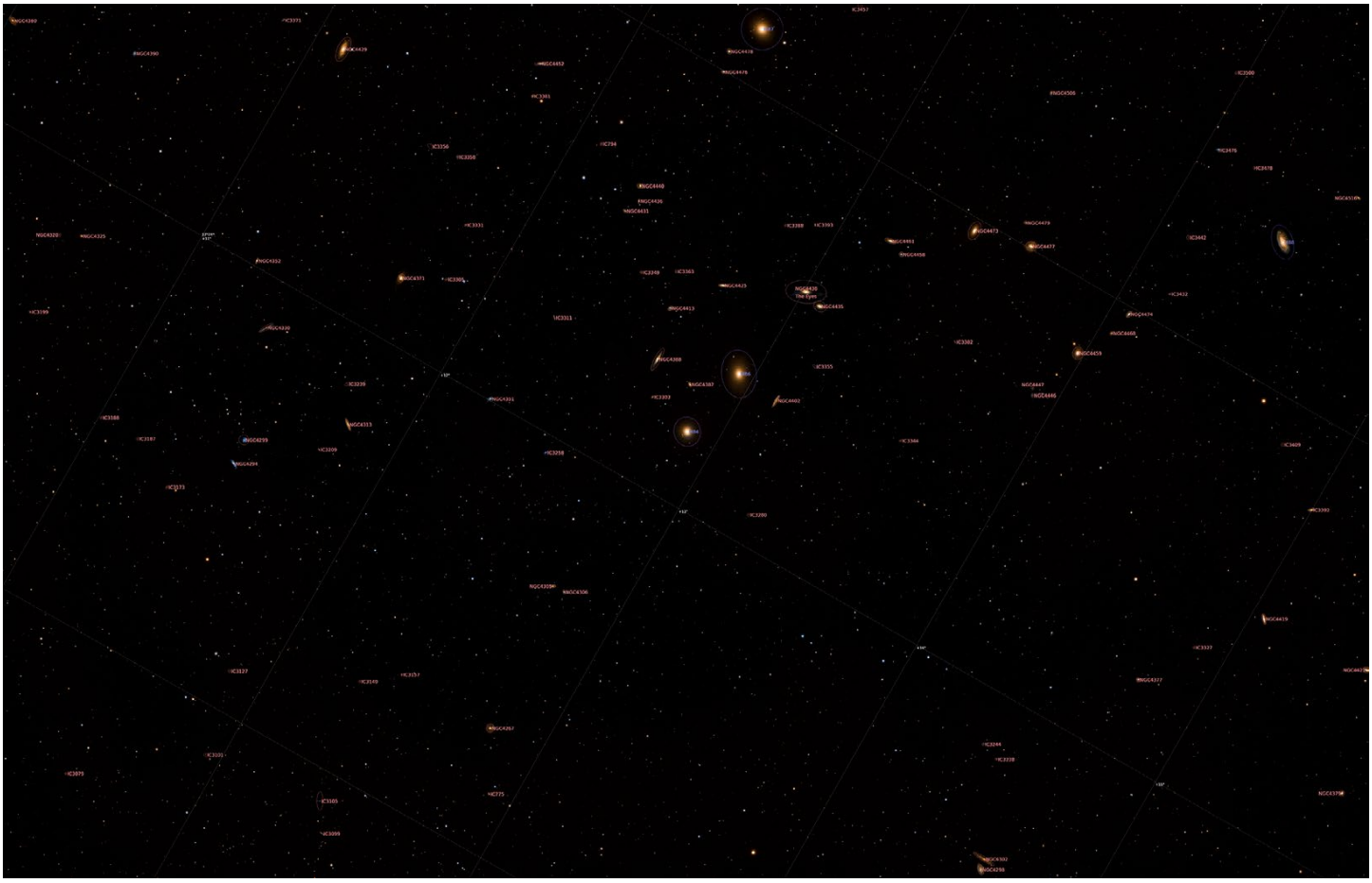
M95 by Gary Garzone

Markarian's Chain by Eddie Hunnell

Taken last night (April 10) in NC. Camera is a MC6200MC Pro. Telescope is a 75mm refractor with a 405mm focal length. This is 22 subs of 5 min at f5.4 I believe. Sky was Bortle 4 (about as good as it gets unless I go to the Outer Banks or leave the state. There were some high thin clouds that appeared and did impact image quality. I only dropped subs with airplanes (I am near RDU airport) and satellites. These dropped subs totaled 4. Image and annotated image attached.

While imaging, we saw a very wide spread Starlink chain. It was spread far enough apart that we could only see 1 at a time. But I counted at least 5 in a row on the same route following each other. And then an hour later we saw what looked like a meteor breaking into pieces but moving slowly. When I quickly pulled out my binoculars, it was another Starlink chain going about 90 degrees in direction to the first one. This one had 19 very closely packed satellites. Cool but also frustrating to see two of these the same night.

Eddie Hunnell



M31 from last Fall by Allen Jeeter

Here is another image I recently got around to doing the processing on. The is M31 Andromeda from last fall. This was taken at my backyard observatory here in Berthoud.

Now that my processing is caught up I should get around to fixing the wind damage to the dome from the winter wind storms we had.

Capture details
Telescope Askar SQA106 509mm @ F4.8
Camera Ogma AP26MC Monochrome (IMX 571 APSC)
Mount Astro Physics Mach 2 GTO
Guide Scope SkyWatcher Esprit 120 (piggyback scopes)
Guide Camera Touptek G3M662M
Software NINA and Pixinsight

280 minutes Luminance
200 minutes each RGB

Cheers, Allen

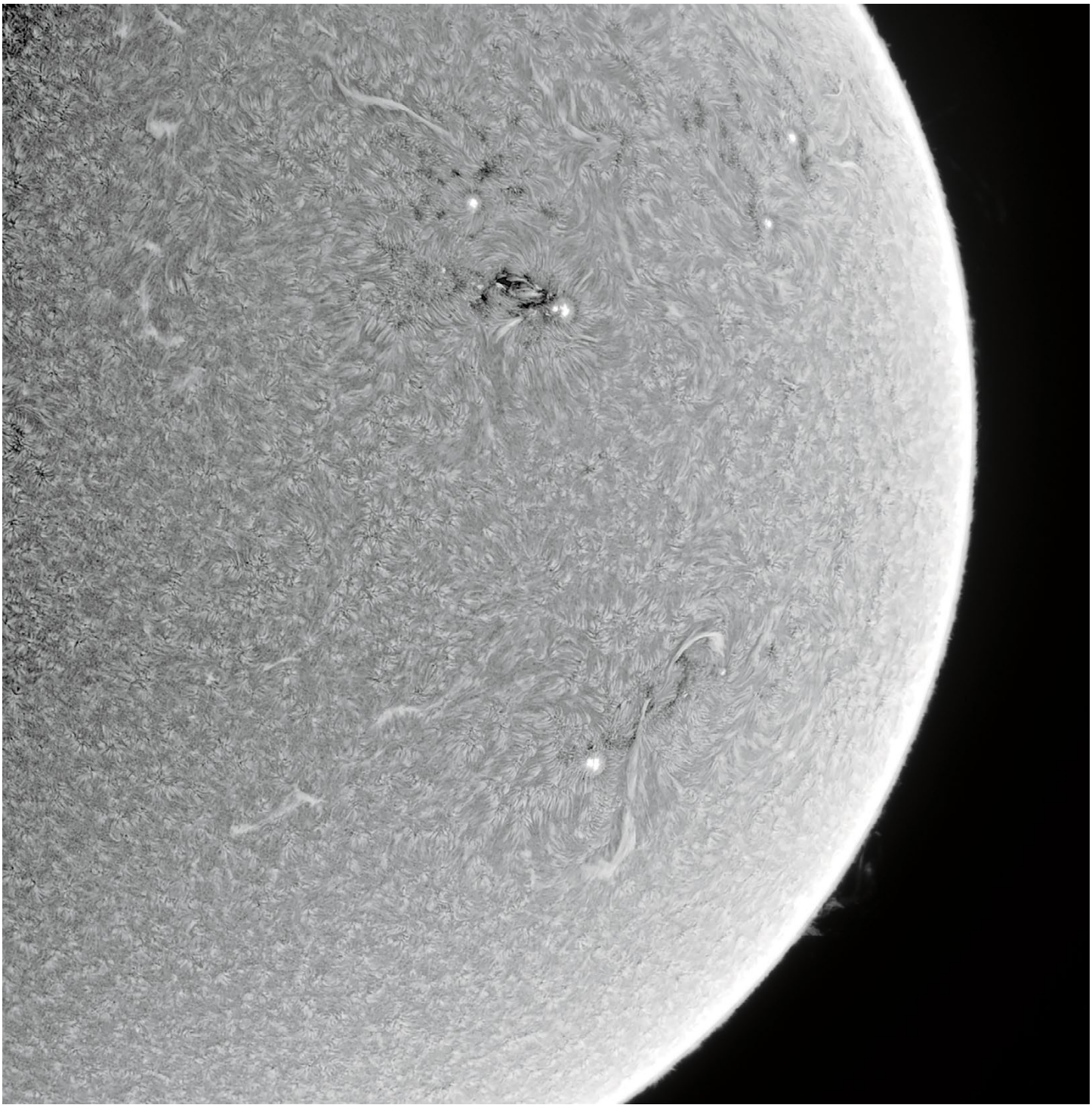
NGC-7000 first light at Starfront by Allen Jeeter

This is my first light image at Starfront from last fall. I was having some issues stacking the data. I had to set it aside at the time due to other commitments. I finally got around to taking a closer look. I figured out the issue. I had mixed in another target accidentally. Dumb mistake that wasted a lot of time. Anyway, better late than never I guess.

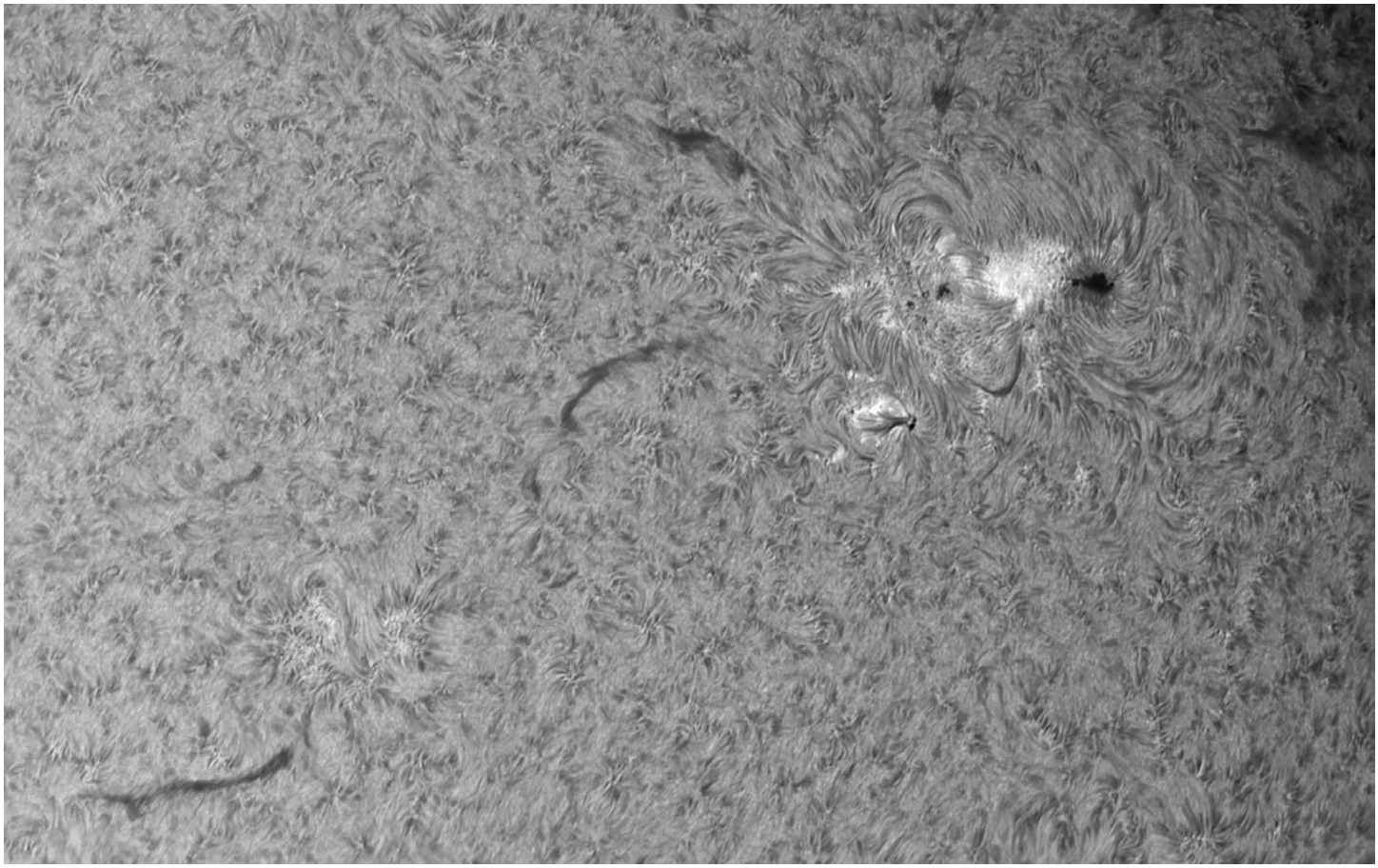
NGC-7000 The North America Nebula
Telescope Askar FRA500 with reducer @ F3.9
Camera ZWO ASI294MM Pro monchrome
Filters ZWO LRGB
Guide Scope William Optics Uniguide 50mm
Guide Camera Player One Sedna M
Mount Warp Astron WD-20

Total Integration time is 16 hours taken September October of 2025
4 hours each of R G B and L

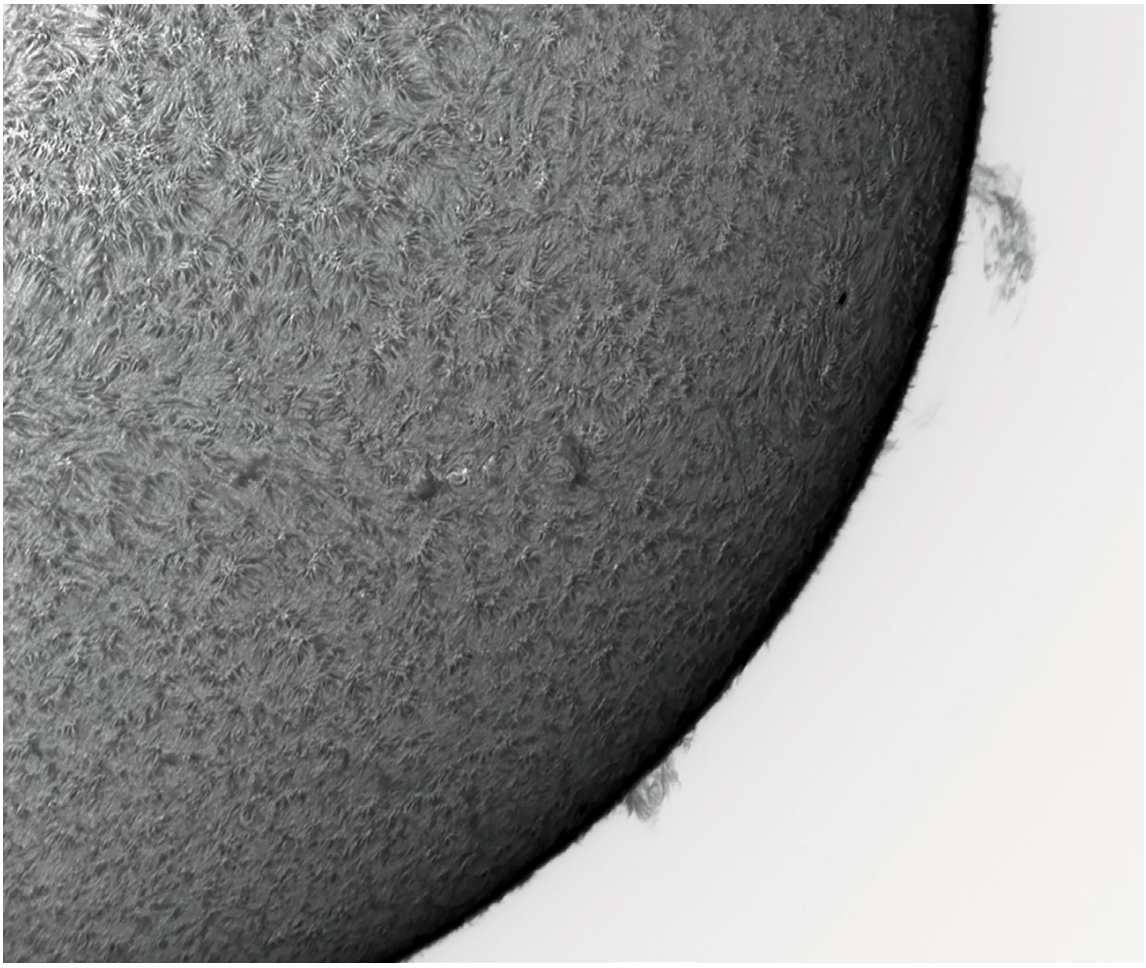
Cheers, Allen



AR 4404. 4405, 4506, 4408, and 4409 by Brian Kimball on April 6 (seeing above ave)



Solar AR 4419 in h-alpha on April 21 by Brian Kimball (seeing excellent)



AR 44-15 on April 19 by Brian Kimball (above ave seeing)

M42 in narrowband by Tally O'Donnell

There is very little time after dark to image the winter milky way so the other night I decided to gather a quick and dirty of M42 in narrowband from New Mexico. This is an SHO image with 30 minutes each of Ha, OIII, and SII with 10-minute subs. Unfortunately, that long of subs blow out the Triangulum, but I was surprised to see how much Ha structure there is around this object.

Tally

The Southern Owl Planetary Nebula by M. J. Post

This dim beauty is not imaged much, even by astronomers in the southern hemisphere. It lies 2500 l.y away in Hydra at Dec -34 degrees, and it does not have an IC or NGC designation. Instead it is known as Kohoutek 1-22 or PNG 283.6 + 25.3. It is 3 arc minutes in apparent diameter, 2.2 light years in actual diameter.

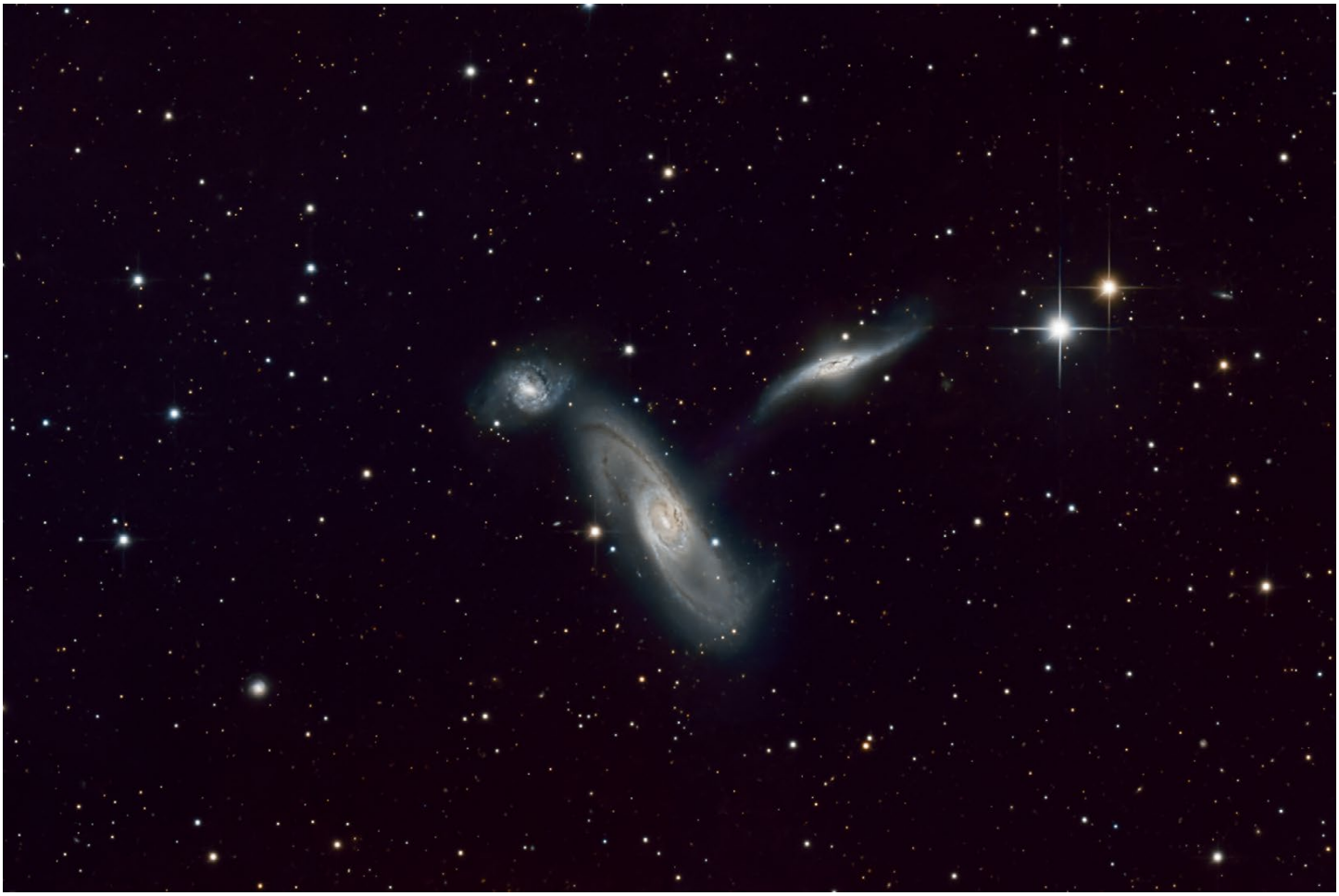
This is an HOO rendition, 2 hours each H-alpha and OIII from 11" RASA scope at DSNM, ASI 6200MM camera. FOV is 27 x 18 arc minutes.

M.J. Post

Arp 286 in Virgo by M. J. Post

Here are three interacting spiral galaxies in Virgo, NGCs all. The largest is NGC 5566 while upper right is 5560 and upper left is 5569. All are about 66 M/l/y distant. Dominant NGC 5566 is huge - 150,000 l.y. in diameter.

From DSNM, CDK14 scope, 3 hours exposure time, 24 x 16 arc min FOV.



An Odd Couple in Virgo by M. J. Post

The two featured galaxies here are NGC 5850 (barred spiral) and NGC 5846 (elliptical). They appear close to one another but they are not. The spiral is 132 M.l.y. distant while the elliptical is only 90 M.l.y away. They are not interacting.

DSNM, CDK14 scope, 3 hours on target, 36 x 24 arc minutes FOV.

M.J. Post

Tidal Tails Galore - NGC 3981

This is my first venture into the southern constellation of Crater about 20 degrees south of the celestial equator. According to scientific speculation, this galaxy experienced a significant merger many hundreds of millions of years ago. No hint of its dancing partner remains, but disorganized and far-flung tidal tails of stars leave behind undeniable evidence of the event. Distance from Earth is about 65 M.l.y. It is receding from us at more than 1000 miles per second.

From DSNM, CDK14 scope, 4 hours on target, 24 x 18 arc minute FOV.

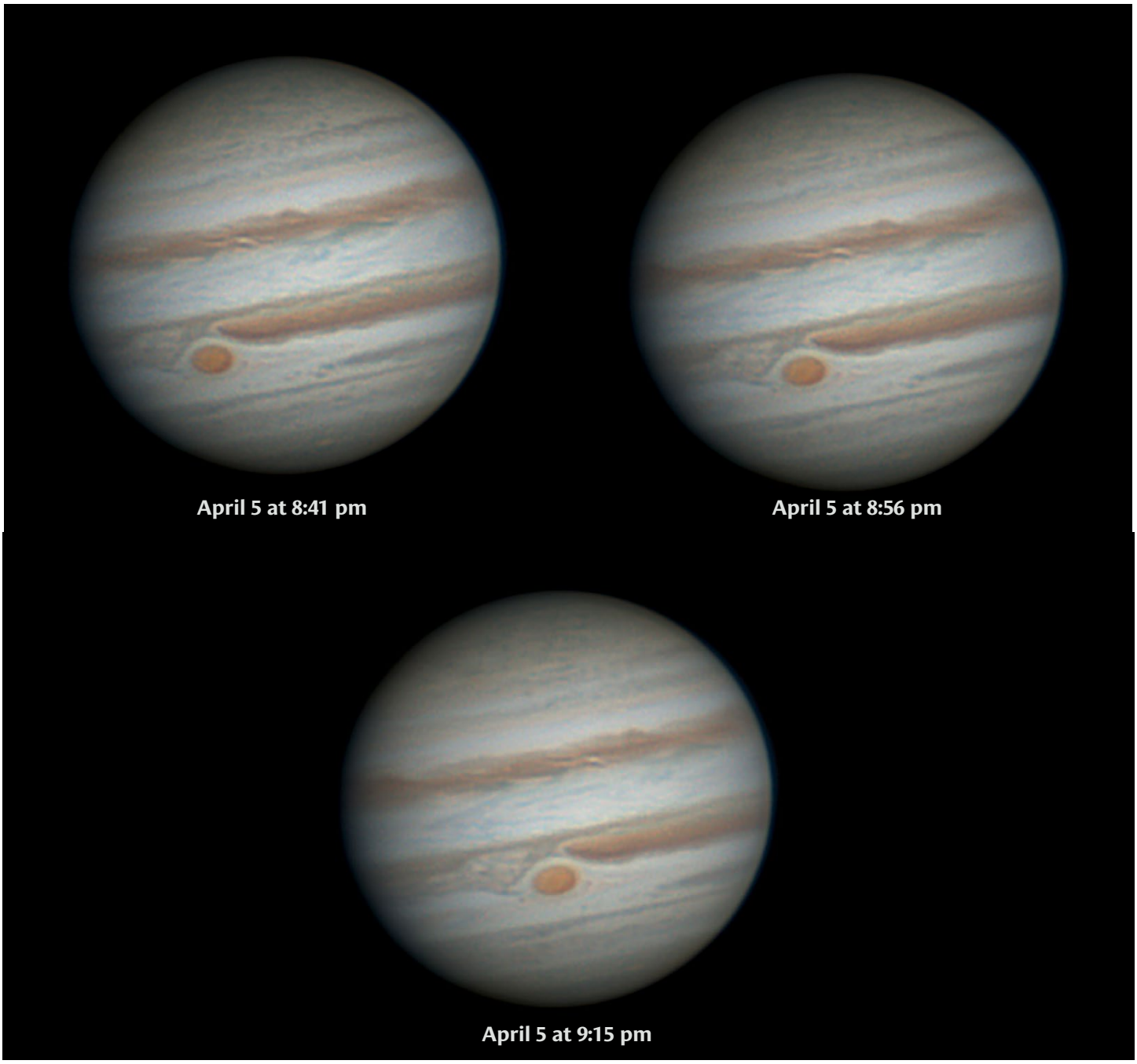
M.J. Post

Jupiter from last night - April 5 by Vern Raben

Here are three images of Jupiter from last evening over a period of about 45 minutes taken with C14HD scope, Televue 2X Barlow, and ASI 462 MC camera. Seeing (turbulence) was average, 5/10. I was only able to capture around 26 fps; normally I do over 100 fps at this ROI of 1280x1024 setting. I didn't realize it last night but there was probably an issue with the usb hub. Each one minute video was stacked with Autostakkert using 50% of the 1600 frames. First two images are de-rotated stack of 15 images from Autostakkert; the last one has 20. Each de-rotated image represents 12 thousand+ frames.

The is my first time using a new tool called LuckyStackWorker developed by Wilco Kasteleijn from the Netherlands (see https://www.wilcokas.com/luckystackworker)
He developed this amazing tool with an easy to use interface. I tried it after viewing a video on YouTube with Chris Go, see https://www.youtube.com/watch?v=JbaeHV2tuX4 Imagine what is possible with above average seeing and a high frame rate!

Vern



Comet PanSTARRS (2025 R3) this morning (Apr 12) by Paul Robinson

This morning was nice out at the upper Sandstone Ranch parking area, which is currently under construction, but with enough available parking to work. No one else was there at all 4:30-5:15 am while I was there.
25x100 bino's showed the head well as a dense small fuzzball. The tail was seen to about 1 deg, with surprising difficulty considering its appearance in photos. I took 2 framings for a mosaic using SeeStar S50 to get about 2 deg of tail, part of which is ultra thin and rather bright. No sign of dust, really. For the mosaic, I restacked 5 minutes worth of 10-sec frames to exclude obvious satellites and ran the Ai noise remover. The mosaic was done in Paint by brute force. I also took one framing using a Nikon D750 200mm f/l zoom and a set of 20s exposures at 3200 iso. I used CCDstack2 to flatten the field so I could enhance it. Not great.
The visible tail length in that one is about 4 deg.

The attached image is the two results side-by-side, NOT to the same scale. This comet will continue another week or so, now gradually sinking in the east as it brightens to maybe 3rd or 4th mag and growing some in size.
Due to lack of dust, I do not expect the forward scattering effect to help it brighten.

That is all for now, Paul Robinson

30 years Ago – 1996 **(**No newsletter available)

20 Years Ago – 2006

- April Meeting Notes: Since we have two long presentations, we skipped the officers' reports and went directly to the Starry Night® astronomy software demo followed by Bryan R. White Comets and Auroras 3-D slide and musical show.
- Using Starry Night® Pro 5.8, Philippe illustrated the 3/29/06 solar eclipse viewed from Libya, the 5/15/2003 moon eclipse viewed from Erie, and viewed from the moon itself, the September 5th close encounter with Mars, the Mars retro-motion, the 6/8/2004 transit of Venus viewed from Barcelona (Spain), ISS orbiting the earth, and finally driving his "space ship" Philippe took us (at 10 times the speed of light) to Venus, we all flew between the rings and came back to earth.
- After a short break, Bryan R. White started a fantastic slide and musical show with pictures of comets, followed by a second show with aurora pictures. Absolutely amazing!
- How I Do What I Do? By Mike Hotka: In part five of How I Do What I Do, I will discuss tips and tricks I have learned to aid you in doing some of the observing club programs of the Astronomical League: Lunar and Lunar II Observing Clubs. Being a deep sky kind of guy, I used to find the moon an annoyance. After completing both of these programs, I have found a new appreciation of this bright and near object. On the moon, you do something called 'crater hopping'. Similar to 'star hopping', you move from a known crater to the one you are looking for on the observing list. To aid me in this, I purchased a lunar atlas. I purchased The Atlas of the Moon by Antonin Rukl. This book was invaluable in finding the exact features that I needed to observe. Then I downloaded the Virtual Moon Atlas from the website. I used this program to determine when the terminator line would be near the objects on the lunar surface. Observing some of these features near lunar sunrise or sunset was vital to being able to see them. Lava domes and riles are impossible to see if the sun is too high. They disappear. But observing these objects within hours of the sunrise or sunset, illuminates them just so as to make them stand right out on the lunar surface.

The origin of the Astronomy Day

- Astronomers, both amateur and professional, love sharing their passion for astronomy with the public. Observatories hold open houses, astronomy clubs hold star parties, but most of these events happen at fairly remote sites, where it's often hard to entice the casual visitor to attend. In 1973, Doug Berger in Northern California organized the first Astronomy Day with the idea of bringing astronomy to the public, rather than expecting the public to come to it. Events were held in city parking lots, shopping malls, anywhere people gathered. The idea quickly caught on, and Astronomy Day is now celebrated around the globe.
- We had an awesome Astronomy day at Twin Peaks Mall once again. We had three great solar scopes set up outside and yes it did clear for views of Sun. We do seem to get lucky sometimes with weather. Andrew Planck's and my H alpha scopes, also one with white light solar filter too. We gave away many posters, cards, pictures and more. We had Night sky network demonstration of gravity, scopes set up in mall with several tables of stuff. We also did a Flanders star party that same night with a pretty good turn out again. Larry T from Boulder County day school from Gunbarrel brought out kids to Flanders that night. I want to thank the good turnout of Volunteers on Astronomy day, Brian Kimball, Michelle Lavers, Andrew Planck, Vern Raben, Terry Frazier, John and Gerdie Peterson, Philippe Bridenne, Mark W, Jeff L, Ray Warren, Bob Spohn.

Northwest Nebraska star party by Vern Raben It is now less than a month until the first ever Northwest Nebraska star party which will be held on Memorial Day weekend, May 26 through the 28th.

- For those interested in historic sites, nearby Fort Robinson opens up on Memorial Day. Fort Robinson was the US Army's center of operations for battles with the Sioux tribes so there are many historic buildings/sites.
- A number of geologic/paleontology sites are nearby as well, for example a place called "Round Top" where thousands of buffalo committed mass suicide. Also close is Toad Stool Park where many skeletons of mastodons, eohippus, and other prehistoric animals have been found.
- For meals, there is a place called "Drifter Cook Shack" which is quite good and not far away. Otherwise, bring your own food. As I mentioned previously, we will have a kitchen available. Group meals are a possibility if anyone is interested. Grocery stores, gas, etc are available in Crawford so its not necessary to pack/plan everything.
- Average temperature at end of May for this area is 75 deg F in the daytime and 52 deg at night. As always remember to bring full winter gear, sun block, mosquito repellent, etc as we never know what weather conditions will be.

10 Years Ago – 2016

Vern Raben, president, opened the meeting and introduced club officers: Gary Garzone vice president, Mike Fellows treasurer, Brian Kimball board member, Jim Elkins board member, Tally O'Donnell board member, and Joe Hudson secretary. Agenda for the evening was announced. Upcoming events on the calendar were announced.

Presentation: "Time Domain Astronomy and the Las Cumbres Global Telescope" by Dr. Tim Brown (who has been a LAS member for 25 years) is the current Principal Scientist at LCOGT, and also Adjunct Professor associated with the Center for Astrophysics and Space Astronomy (CASA) at the University of Colorado, Boulder. Astronomer's view of the universe is changing from seeing the sky as unchanging "wallpaper", to a dynamic picture in which everything changes, all the time. More, we are realizing that the ways in which things change often give us clues to the physics of astronomical objects that we could not obtain otherwise. The buzzword for this view is "time-domain astronomy", and its hardware manifestations range from the 8-meter Large Synoptic Survey Telescope (LSST), down through the Kepler Mission's 1-meter space telescope, to 30-cm backyard telescopes run by enthusiastic amateurs. In the middle of this range is Las Cumbres Observatory Global Telescope (LCOGT), so far the only observatory dedicated exclusively to the general field of time-domain astronomy, and equipped to observe many kinds of time-varying phenomena. LCOGT operates a worldwide network of telescopes with apertures from 40 cm to 2 meters, working on programs that include extrasolar planets, supernovae, near- Earth asteroids, and active galactic nuclei. I will briefly review the history of observational astronomy (and show that observing the time domain is getting back to old roots), and then describe LCOGT's origins and facilities, ending with some highlights of the science that LCOGT scientists are now doing.

Presentation: Observing in Australia by Mike Hotka of the OzSky Star Safari, April 2-9 2016. Mike presented highlights from an observing trip he took to Australia as offered by OzSky.com Major trip highlights included: *Onsite scopes and most of the scope were 'light buckets' and (of course) under a very dark sky *Actual observing nights were April 2 through 9 with all night volunteers to help visitors. *Excellent catered meals (try the kangaroo) If nothing else, the showpiece items in the Southern Sky alone made it the trip of a lifetime. The total trip duration ran 13 days, with travel by air from Denver to Sydney and train to Coonabararbran New South Wales, Australia. Overall the trip was a little north of $3000 US and Mike says it was worth every penny. Business Meeting Treasurer's report was presented by Mike Fellow

- Ongoing LAS projects were discussed:
  - Library Telescope Project - 23 people on wait list for scopes at Longmont Library (average wait time is 8 weeks). Delivered 2 scopes to the Louisville Library. Extension of the Library Telescope project still under consideration
  - Eclipse Planning: NW Nebraska Star Party – Vern to scout the area/possible rental land this Spring
  - Astro workshops at Hall Ranch after the public star party on June 25 and Sept 23
- May 19 LAS next meeting. Topic will be "The Laboratory for Atmospheric and Space Physics (LASP): Understanding Particles and Fields Throughout the Solar System" by Dr. Dan Baker. David Elmore and Tally will talk about their trip to Atacama.

Longmont Astronomical Society
P. O. Box 806
Longmont, CO 80506

Colliding Galaxies
NGC 5427 and 5426 = Arp 271
by M. J Post