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SH 2-11
BY TALLY O'DONNELL

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LAS Meeting on September 17

Jupiter's Four Galilean Moons

Fran Bagenal

Professor Emerita

Laboratory for Atmospheric and Space Physics

University of Colorado, Boulder

After changing our view of the cosmos with Galileo's discovery in 1610, the four large moons of Jupiter – Io, Europa, Ganymede and Callisto – have been challenging our scientific understanding of planetary bodies every since. Fran will present our current understanding of the workings of these four very different objects and outline the plans for their future exploration, including NASA's Europa Clipper mission and ESA's JUICE mission.

Dr. Fran Bagenal is a research scientist and professor emerita at the University of Colorado, Boulder and is co-investigator on NASA's New Horizons mission to Pluto and the Juno mission to Jupiter. Her main area of expertise is the study of charged particles trapped in planetary magnetic fields and the interaction of plasmas with the atmospheres of planetary objects, particularly in the outer solar system.

Born and raised in the UK, Dr. Bagenal received her bachelor degree from the University of Lancaster, England, and her doctorate degree in Earth and Planetary Sciences from MIT (Cambridge, Mass) in 1981. She has participated in several of NASA's planetary exploration missions, including Voyager 1 and 2, Galileo, Cassini, New Horizons and Juno.

https://lasp.colorado.edu/home/mop/home/people/fran_bagenal

https://www.imdb.com/name/nm3293128/bio?ref_=nm_ov_bio_sm

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 and on the members website.

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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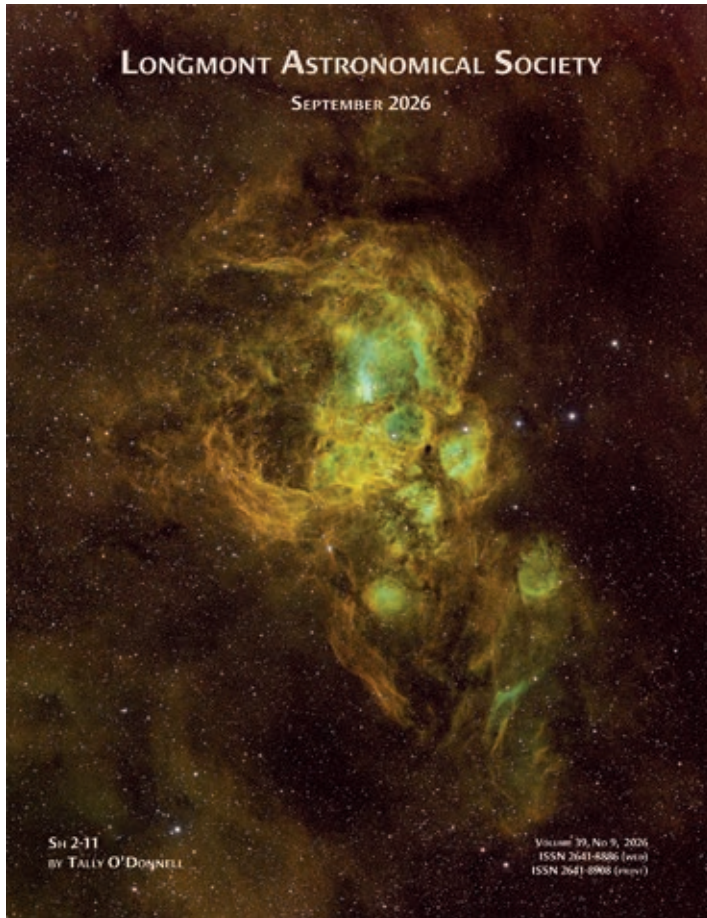
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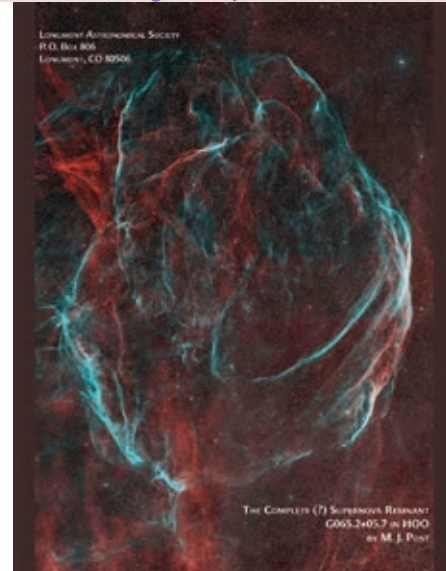
Appointed Positions

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**Front Cover: "Sh 2-11"
by Tally O'Donnell**



**Back Cover:
"The Complete (?) Supernova Remnant
G065.2+05.7 in HOO"
by M. J. Post**



My image of this SNR appeared on the cover of our 2025 calendar, but it depicted only its southern "braids". David Elmore posted a 2-panel-mosaic of the entire SNR on Aug. 13, 2025, an HSO rendition. David's image motivated me to make this 4-panel HOO mosaic of this object using my RASA telescope in New Mexico, and I've finally completed that work.

Good evening,

This is an SHO image of Sharpless 11 in Scorpius with one hour of each filter that I used a slightly weird palate to help bring out all of the structure. We continue to get clear skies in New Mexico after all of the clouds from this year's monsoon.

Tally

The field of view here is about 6 x 4 degrees - 96 full moons! This SNR is therefore almost as large as the Spaghetti Nebula (a.k.a. Simeis 147, Sharpless 2-240, and SNR G180.0-01.7). Because of their similar sizes and distances (3,000 l.y.), I'm assuming this SNR is approximately the same age as Spaghetti, or 40,000 years old. This SNR is nicknamed The Little Veil Nebula and it contains SH2 objects -91, -94, and -96. It resides in Cygnus.

Two hours each, H-alpha and OIII filters, for all four panels; therefore, 16 hours on target. According to PixInsight, each of the four panels contained more than 250,000 stars; so there are more than 1 million stars in the full mosaic. The 16-bit tiff mosaic was 1.5 GByte in size. Saving that as a jpeg at 0 out of 12 quality resulted in a 15 MByte file, too large for gmail. So I used Photoshop to reduce tiff resolution and produce this jpeg at 6.8 MByte in size. What a shame to lose all that fine structure!

M.J.

Planets in September

Mercury

Mercury is not visible naked eye or with binoculars or a small scope less than 50 mm.

Venus

Venus is visible after sunset. It is about magnitude -4.5 in brightness most of the month. Its disk increases from 30 to 47 arc sec across.

Mars

Mars is visible in the morning sky; it is around +1.2 magnitude in brightness. Its disk increases from 5.1 to 5.6 arc sec across this month.

Jupiter

Jupiter is visible low in the morning sky. It is magnitude -1.9 in brightness and the disk is 33 arc sec across. Its Great Red Spot is in good position to view on:

- Sept 14 at 6:21 am at an altitude of 31°
- Sept 19 at 5:31 am at an altitude of 24°

Saturn

Saturn is in great position this month. It will be at opposition with Earth on October 4. The disk is about 20 arc sec across and it is about +0.3 magnitude in brightness.

Uranus

Uranus may be in the constellation Taurus. It is +5.7 magnitude in brightness and its disk is 3.7 arc sec across.

Neptune

Neptune is in constellation Pisces. It is magnitude 7.8 in brightness and the disk is 2.3 arc sec across.

Lunar Phases in September

September 4 at 1:52 am - Third Quarter Moon

September 10 at 9:28 pm - New Moon

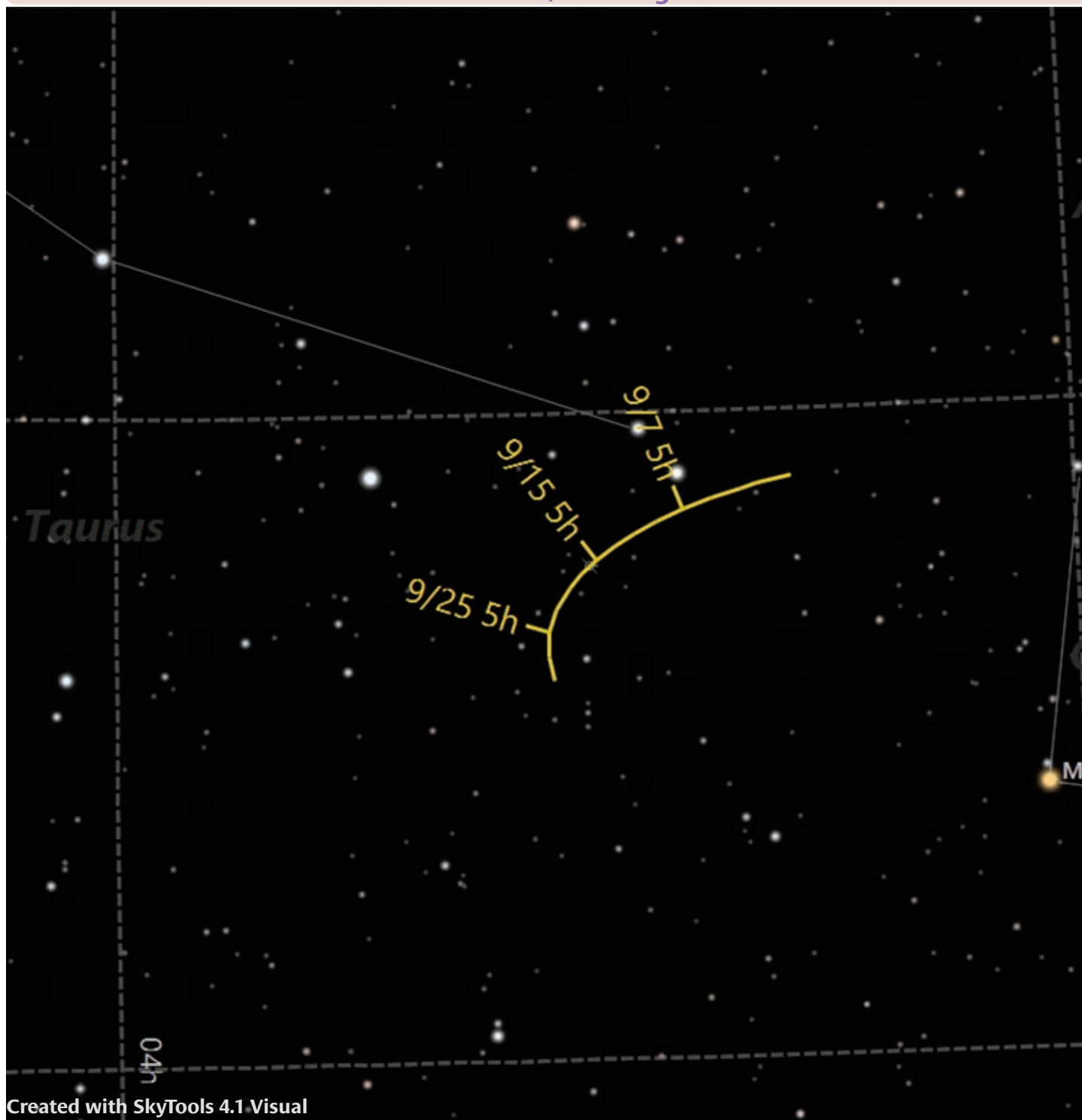
September 18 at 2:45 pm - First Quarter Moon

September 26 at 10:50 am - Full Moon

Meteor Showers in September

There are no type I (major) meteor showers visible in September.

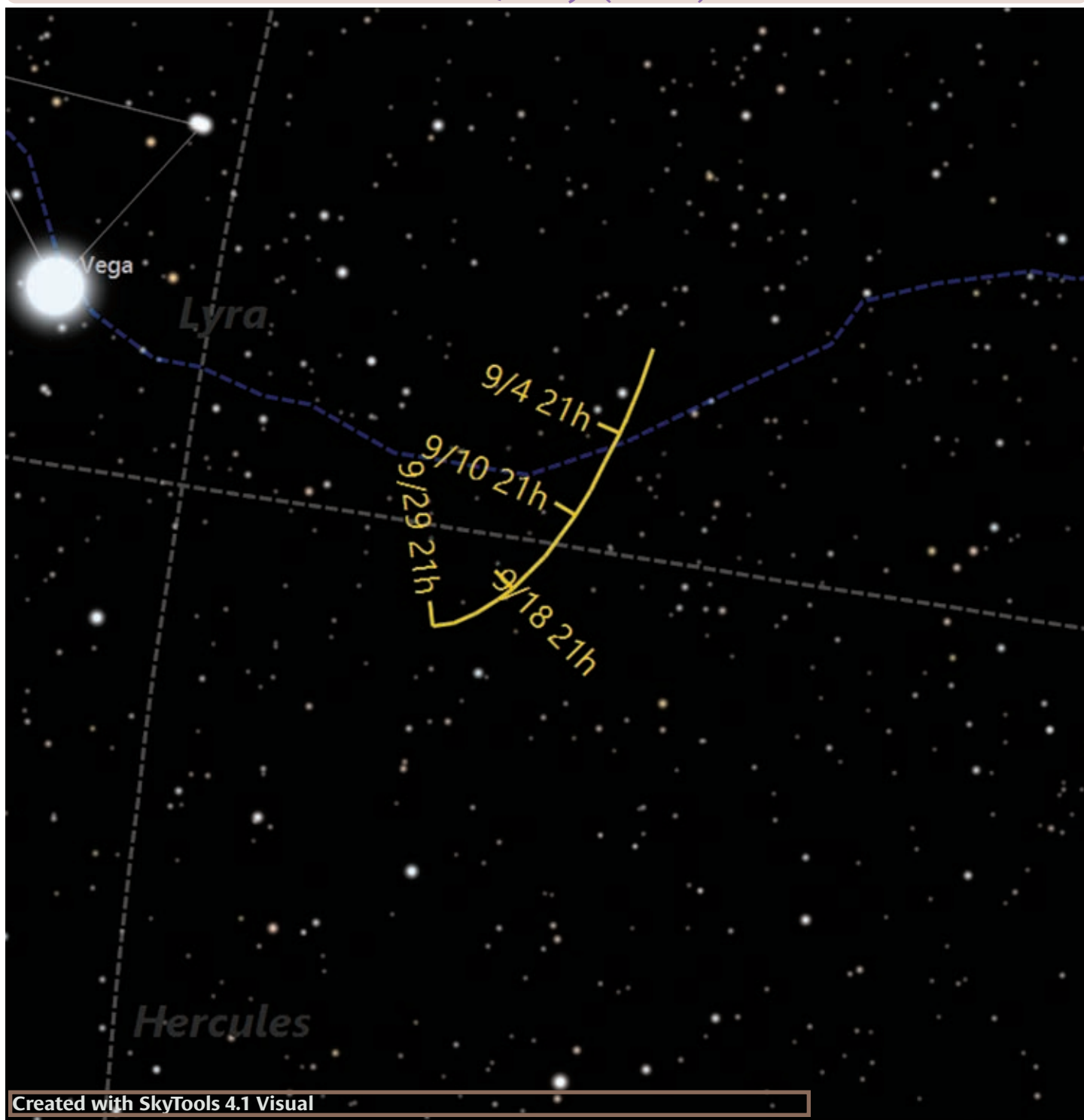
Comet 220P/McNaught



Created with SkyTools 4.1 Visual

Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Sept 1	4:49 am	03h21m19.3s	+08°56'07"	Cetus	8.0	8.2
Sept 7	4:50 am	03h26m50.8s	+08°28'32"	Taurus	8.1	8.4
Sept 13	4:50 am	03h30m55.3s	+07°55'09"	Taurus	8.1	8.6
Sept 19	5:38 am	03h33m29.6s	+07°16'55"	Taurus	8.1	8.7
Sept 25	5:30 am	03h34m32.8s	+06°34'30"	Taurus	8.1	8.9
Sept 30	4:52 am	03h34m16.2s	+05°57'30"	Taurus	8.2	8.9

Comet C/2024 J3 (ATLAS)



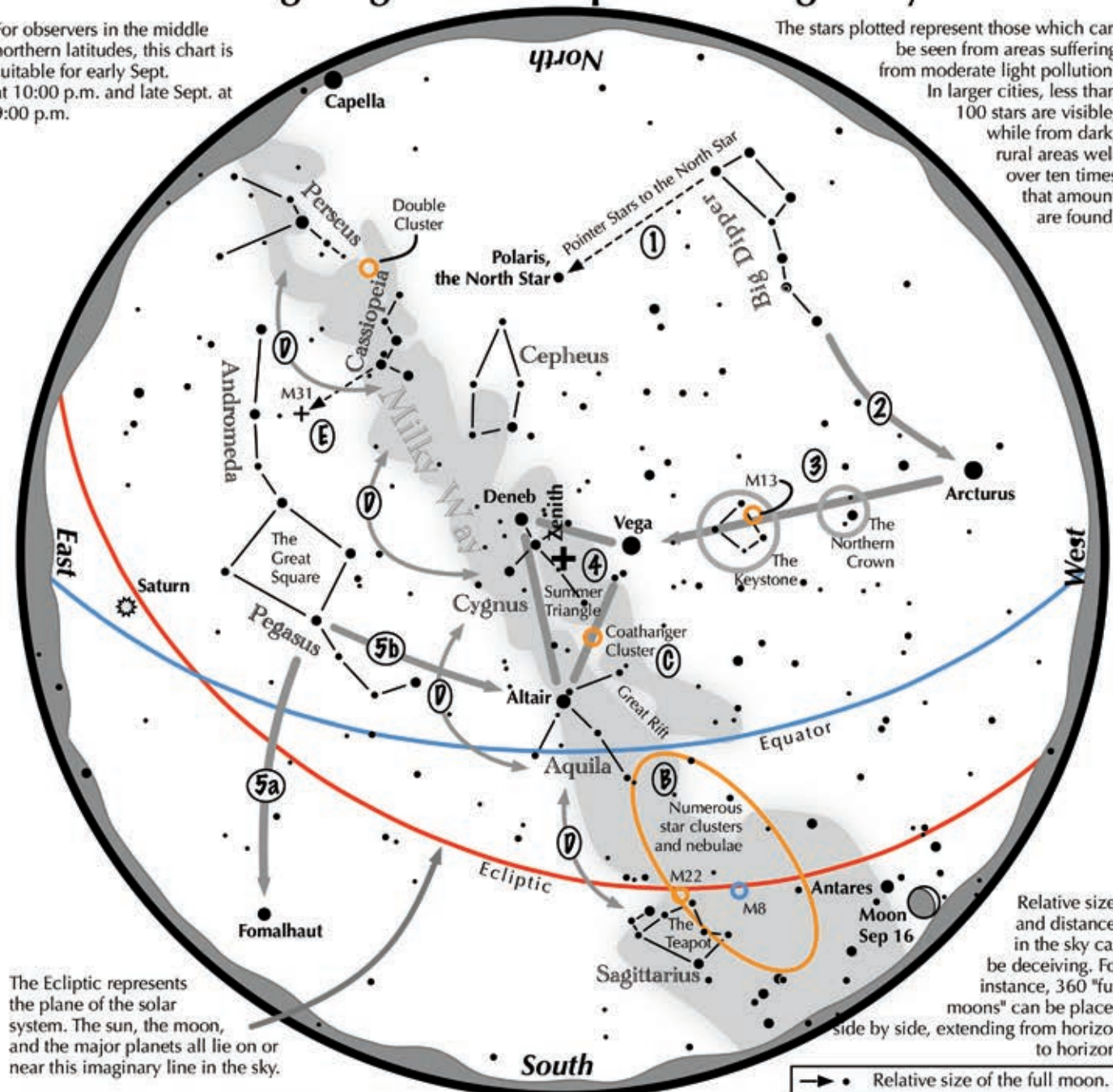
Created with SkyTools 4.1 Visual

Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc sec)
Sept 1	9:20 pm	18h38m03.1s	+43°22'14"	Lyra	14.1	58
Sept 7	9:06 pm	8h33m55.2s	+43°10'05"	Lyra	14.1	58
Sept 13	8:53 pm	8h30m43.0s	+42°54'31"	Lyra	14.1	57
Sept 19	8:42 pm	18h28m27.0s	+42°36'49"	Lyra	14.1	56
Sept 25	Not visible					
Sept 30	8:20 pm	8h26m39.4s	+42°02'38"	Lyra	14.2	55

Navigating the mid September Night Sky 2026

For observers in the middle northern latitudes, this chart is suitable for early Sept. at 10:00 p.m. and late Sept. at 9:00 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.



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

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the September evening sky.
- 3 Nearly overhead shines a star of similar brightness as Arcturus, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 4 The stars of the summer triangle, Vega, Altair, and Deneb, shine overhead.
- 5 The westernmost two stars of the Great Square, which lies high in the east, point south to Fomalhaut. The southernmost two stars point west to Altair.

Binocular Highlights

- A: On the western side of the Keystone glows the Great Hercules Cluster.
- B: Between the bright stars Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- D: Sweep along the Milky Way for an astounding number of faint glows and dark bays, including the Great Rift.
- E: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.

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



If you can catch only one celestial event in the morning this September, see one of these two.



September 6:

Celestial Parallelogram of Castor, Pollux, Mars, and the Moon

September 24:

Mars aligns with Castor and Pollux forming the Triplets of Gemini

Look in the east 90 minutes before sunrise on Sep. 6.

- The twin stars of Gemini – Castor and Pollux – along with Mars and the crescent moon, full with earthshine, form an attractive parallelogram.
- Jupiter peeks above the eastern horizon.

Again, look in the east 90 minutes before sunrise on Sep. 24.

- Mars aligns with Castor and Pollux, forming the Triplets of Gemini. Its brightness equals that of Pollux.

LAS August 20th Meeting Notes by Eileen Hall-McKim

LAS Meeting Notes 08/20/26

I. Introduction

Our LAS August meeting was held in-person and by zoom on August 20th at the Longmont Evangelical Lutheran Church, 803 Third Ave. President, Vern Raben began the meeting with self-introductions of those attending in person and those online. Eighteen attended in person, 5 by zoom.

II. Main Presentation

Our speaker for the evening is Dr. John Bally. John is Professor Emeritus in the Department of Astrophysical and Planetary Sciences (APS) at the University of Colorado in Boulder. He earned his PhD from the University of Massachusetts in Amherst on one of the first radio telescopes sensitive to mm-wavelengths. He spent 11 years at AT&T Bell Laboratories in the group that discovered the Cosmic Microwave Background before moving to CU Boulder in 1992 where he continues his research in star and planet formation, the interstellar medium, and cosmic evolution. He continues to use facilities such as the James Webb Space Telescope (JWST), Hubble Space Telescope (HST), and Atacama Large Millimeter Array (ALMA). He operates his own observatory in Breckenridge, Colorado, where he has a PlaneWave CDK20.

We are the first generation to see the Universe in all wavelengths of the spectrum. Within the last decade, we opened new ways to see the Cosmos using waves of gravity. Dr. Bally will show new images taken with our best telescopes such as Hubble, James Webb and the Atacama Millimeter Array.

“Opening New Windows to Our Universe” By Professor John Bally

We are the First Generation to see the Universe in all wavelengths of “light”

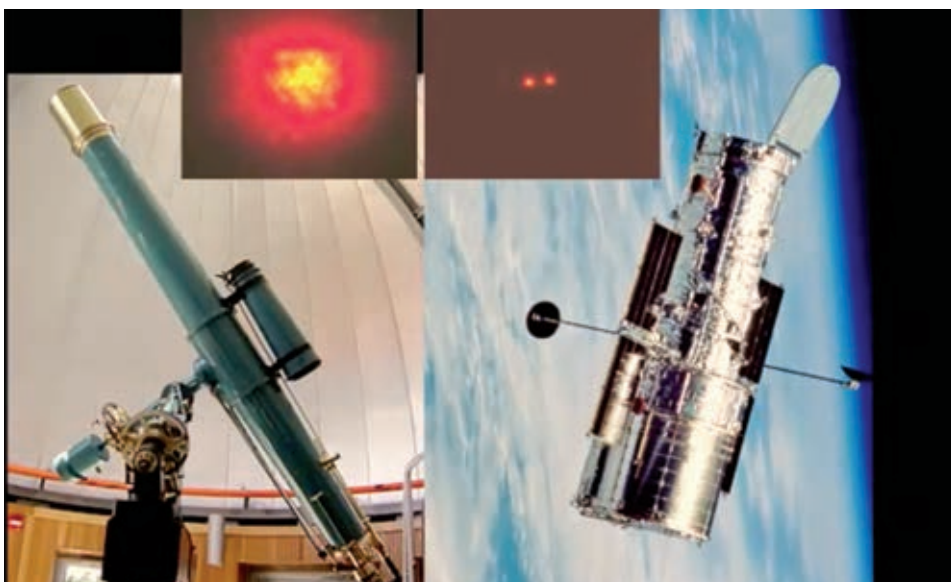
- Access to space – we have dozens of space telescopes operating now throughout the electromagnetic spectrum
- Electronics Industry – to fabricate detectors to work throughout the spectrum, at all wavelengths – only visual and radio before; photographic plates, now entire spectrum at our disposal

Through the new windows we can now detect

- Waves of gravity
- Neutrinos

John grew up with early interest in astronomy- with 8” Alvan Clark Telescope at Chabot Space & Science Center, Oakland, California where he got his start

Hubble on right – images taken from the two scope – objects that appeared single from smaller scopes became double – why we built Hubble; to get above atmosphere, we are diffraction limited at a 2.4m telescope





Europe has built currently the largest visual and near-infrared telescopes in Cerro Paranal, Northern Chile with 4 – 8 m telescopes and 4 axillary telescopes which can be linked together to synthesize 100 m aperture called “Gravity”; difficult technology but it does work.

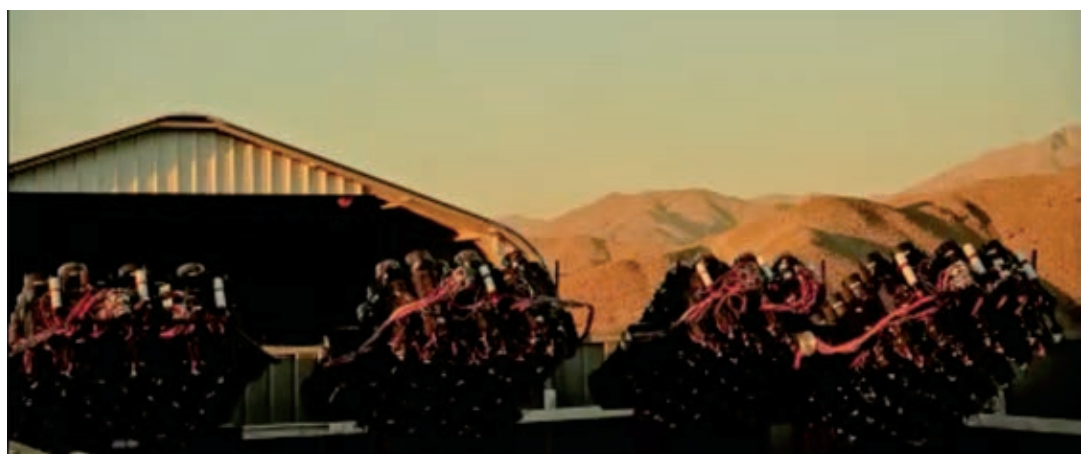
European Southern Observatory Extremely Large Telescope

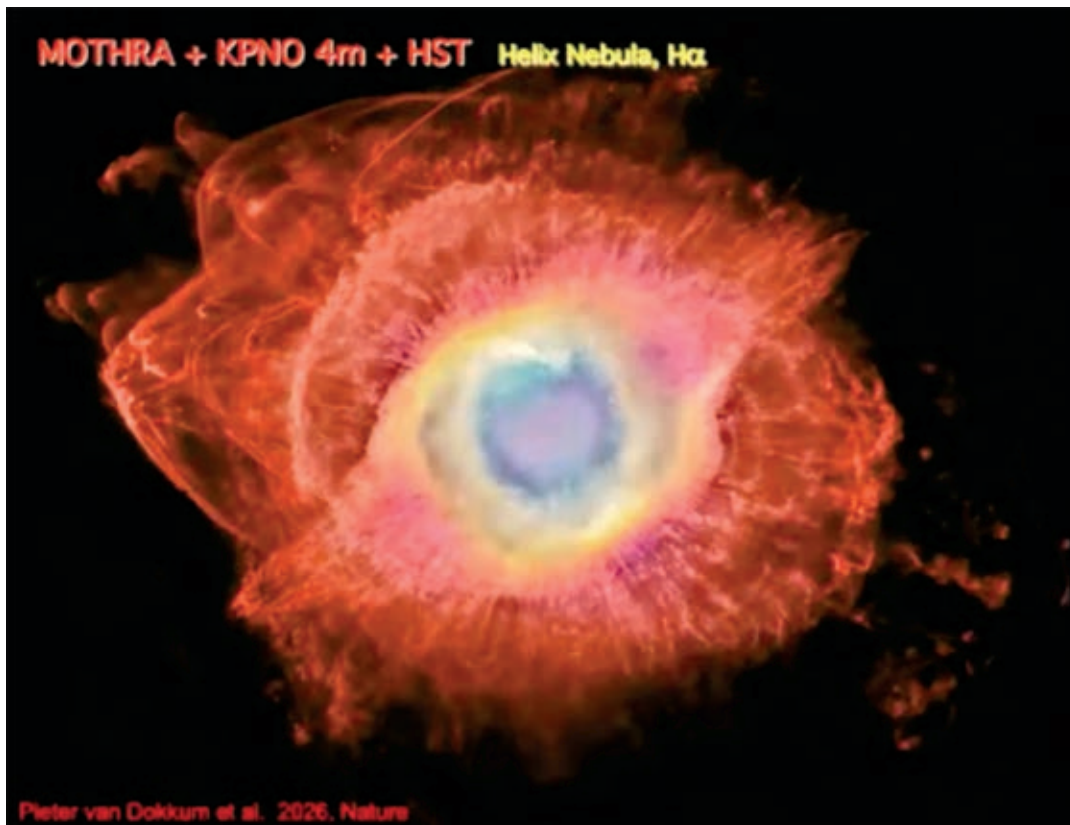
- 39 meter telescope under construction in Northern Chile
- Europeans also building this observatory – first light probably in about 2 years
- Extreme adaptive optics $1/100^{\text{th}}$ of arc/sec
- For scale: small red truck object in foreground



MOTHRA – this instrument just being commissioned now. Ultimate goal to have 1,140 high-end Cannon Telephoto lenses of 400mm each equipped with CMOS camera– will be able to “tune”

- First results just published this week in Nature: Helix Nebula





Helix Nebula – First Light Result - 1 light year in diameter – Preceding red giant star wind is now interacting with interstellar medium – deepest image ever achieved

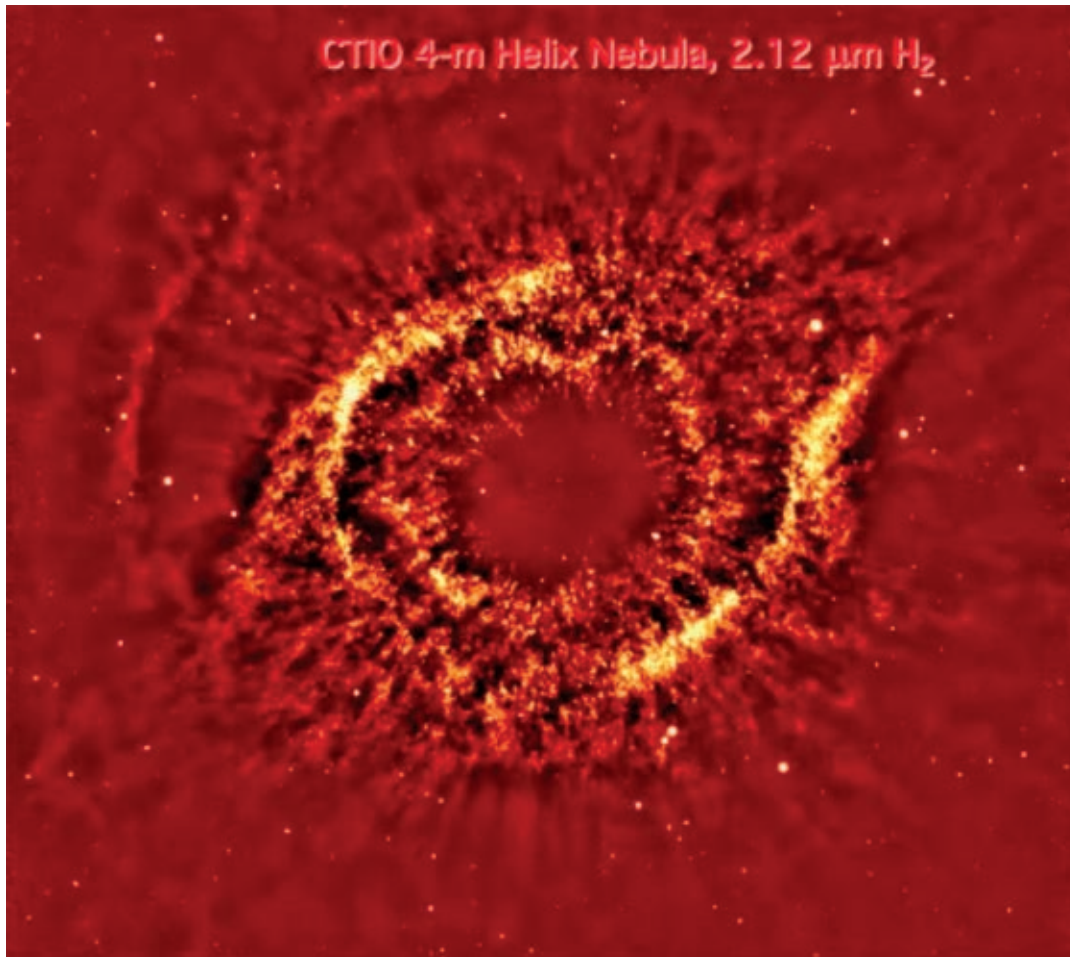


Image taken by John from a 4m at Cerra Tololo Inter-American Observatory Northern Chile – 20 yrs ago - can see breaks up into knots

Image recently put out by James Webb

- Show knots are like comets
- Diffused gas left over chards from planetary nebula 2x the mass of the Sun
- Core collapses into white dwarf
 - produces little chumps of gas 10s of thousands of small comets -being blown back into space in the process of cosmic recycling



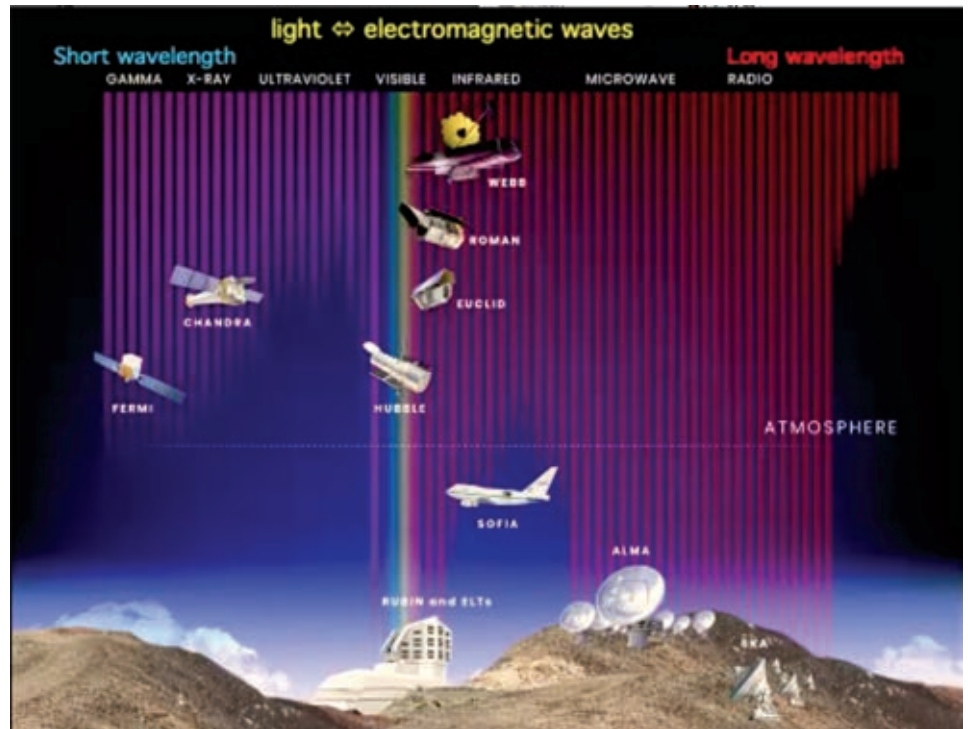
ALMA (Atacama Large Millimeter Array)

- Built in high Andes for the driest air
- 5,100 m (16,000 ft) Atacama Desert, Chile
- Built 66 antennas – resolution as good as 10
- See spatial structures of clouds in molecules but also measure the kinematics
- Volumetric – measurement of volume, the challenge is to deal with volume of data

John is part of the consortium of 150 members to map the entire galactic center, called the (ACES) Project ALMA CMZ Exploration Survey – maps more than 650 light years across the Central Molecular Zone – a project designed to understand how gas condenses into stars in the extreme and chaotic environment at center of our galaxy.

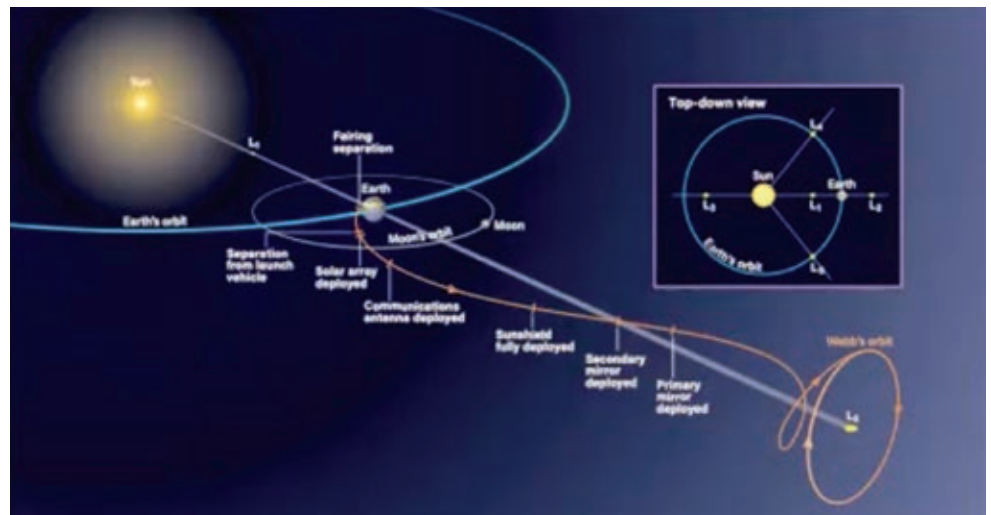
Why go to space?

- Diagram lines show where radiation penetrates, becomes opaque at low frequencies; if you want to see most of the spectrum have to go to space
- Can see infrared from airplane, but difficult to use, very costly in fuel
- It was decided that spacecraft are cheaper than flying planes
- Space has no turbulent atmosphere that blurs images
- Interstellar dust is opaque in the Visual; transparent in the Infrared
 - The Expanding Universe shifts starlight into the infrared; telescopes are time-machines- to look back at the earlier universe have to go back in time; the further look into space the further back in time the expansion is why we went with infrared with JWST



James Webb Space Telescope

- JWST at L2 LaGrange Point where its heat can radiate to space
- To have JWST cool to within 40° of absolute zero have to shield from light Sun, Moon and Earth or it would blind us
- Telescope must cool within 40° of absolute zero to be dark- telescope also radiates

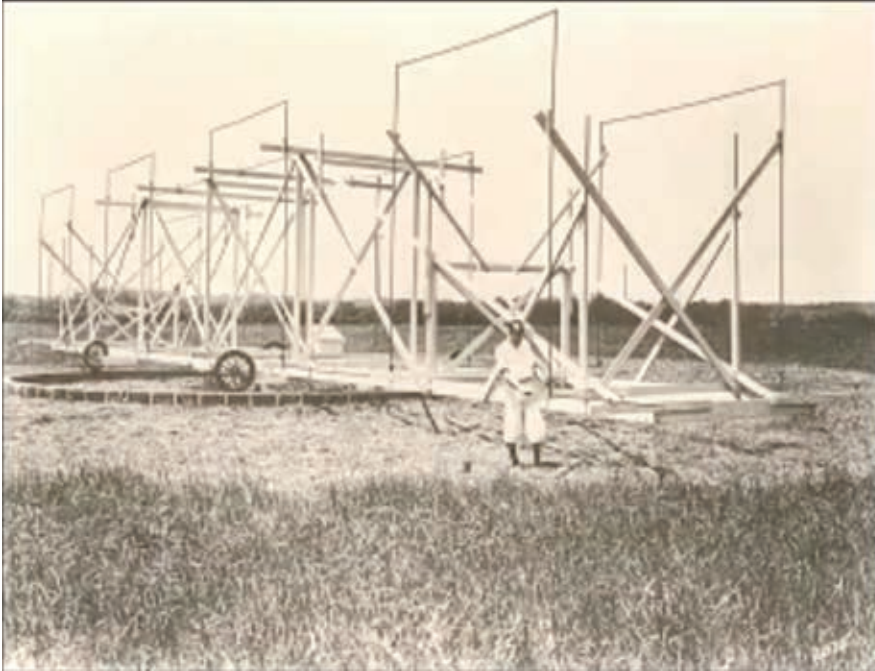


This is the sunshade that blocks the light from the Earth, Moon and Sun – 6.5 m mirror

The 1st New Window 1930s

1931 – 1933 Karl Jansky – first cosmic radio waves (~20 MHz)

1937 – 1944 Grote Reber 30ft.



1920s First Window - Bell Aerospace built first transatlantic radio telecommunication system in the 1920s immediately realized there was some kind of noise

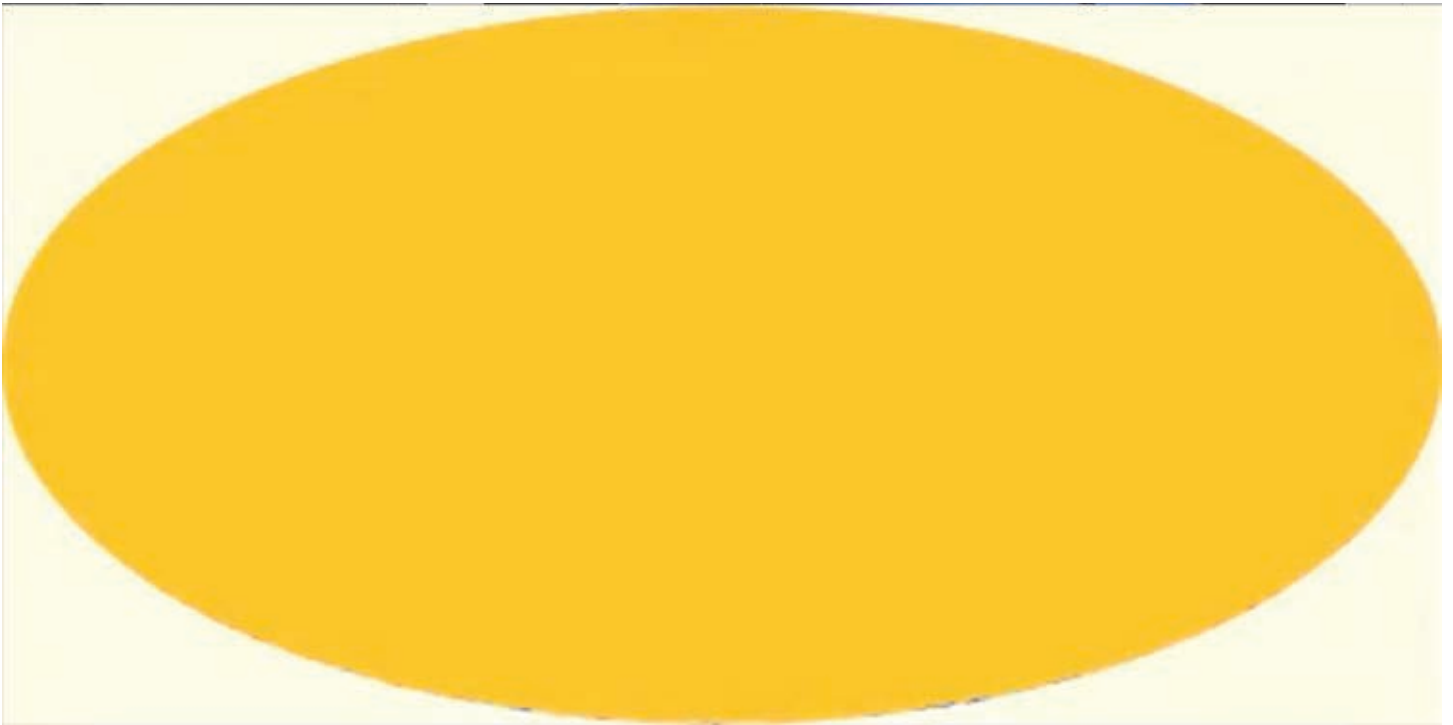
1931-1933 – Karl Jansky – discovered first cosmic radio waves (~20 MHz) noticed noise peaked in summer sky when Sagittarius was above the horizon realized this noise came from beyond solar system, no one followed up work until an amateur Grote Reber

1937-1944 – Grote Reber 30 ft- Pioneer of radio astronomy, engineer who built his own parabolic dish out of wood coated with metal, built own receivers; combined his interests in amateur radio and amateur astronomy, instrumental in extending Karl Jansky's work

After WWII with radar technology, radio astronomy entered its heyday

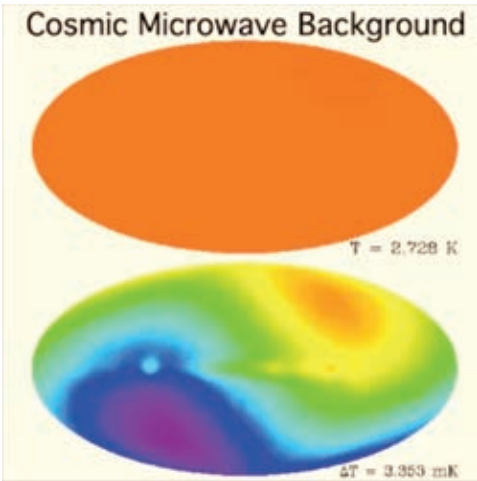
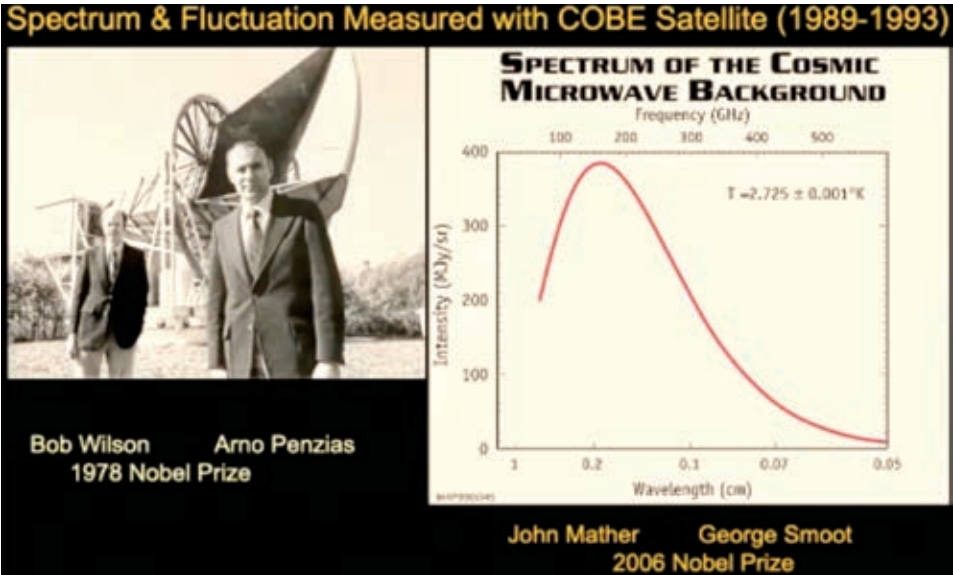


Entire night sky and visual wavelengths. See Betelgeuse, Magellanic Clouds

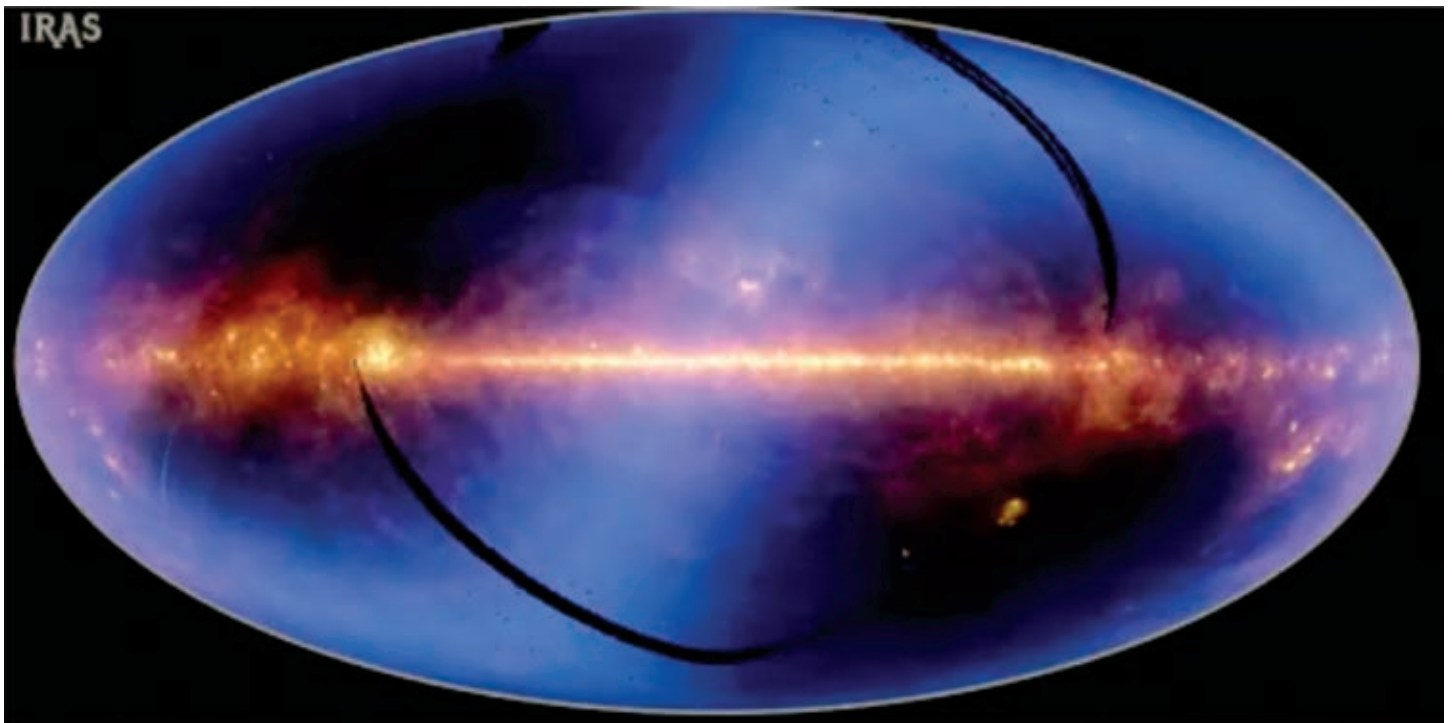


The entire Sky at 1 mm Wavelength – Uniform glow, blue shift toward Virgo at part per 1000

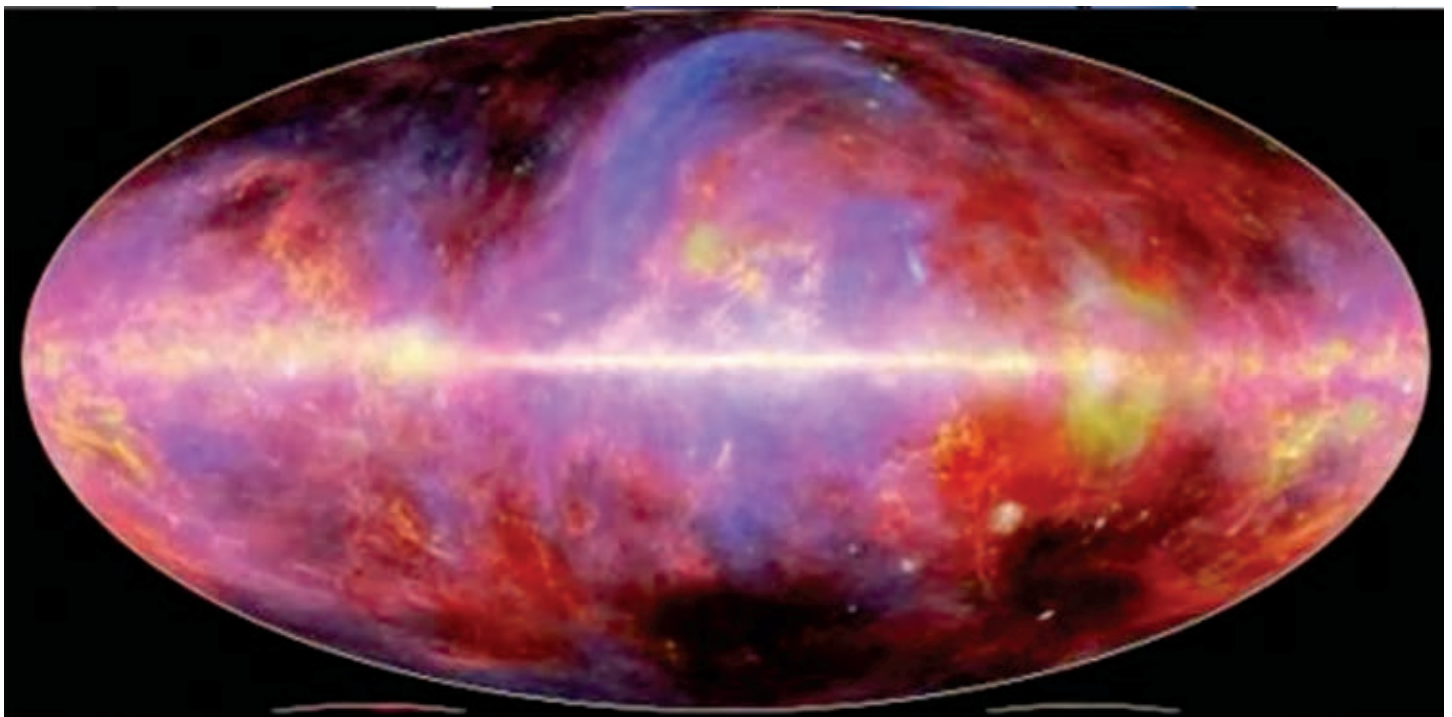
Discovery of Cosmic Microwave
Background: 1965 AT&T Bell Laboratories, Crawford Hill, NJ



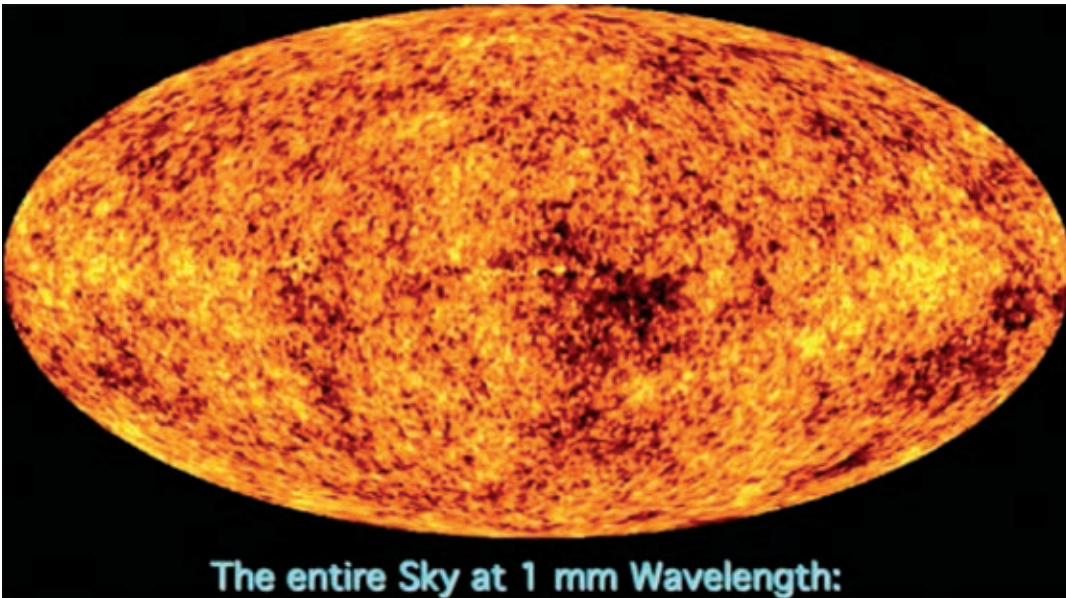
Cosmic Microwave Background Blueshift toward Virgo at part per 1,000; Redshift in opposite direction – we are moving toward Virgo ~ 600 km/s motion with respect to CMB



Same view at infrared Wavelength - Galactic Plane – Dust has become transparent, see all the starlight in the galactic disc plus S-shaped curve is the zodiacal light



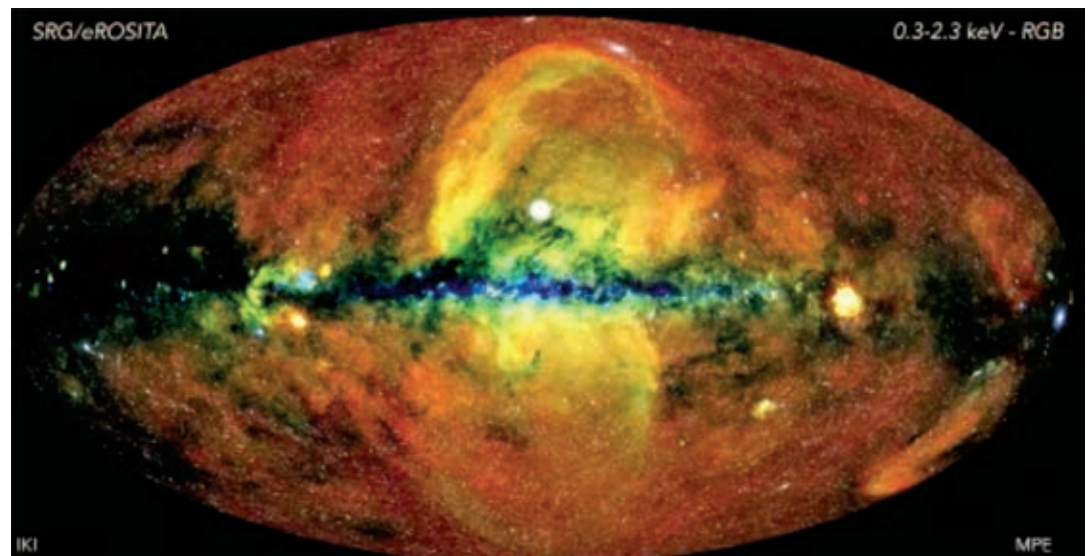
Radio wavelengths the entire sky at sub-millimeter Wavelengths – When go to longer wavelengths, starlight disappears to be replaced by radiation produced by interstellar clouds, then at low frequencies see synchrotron light characteristic of cm wave sky



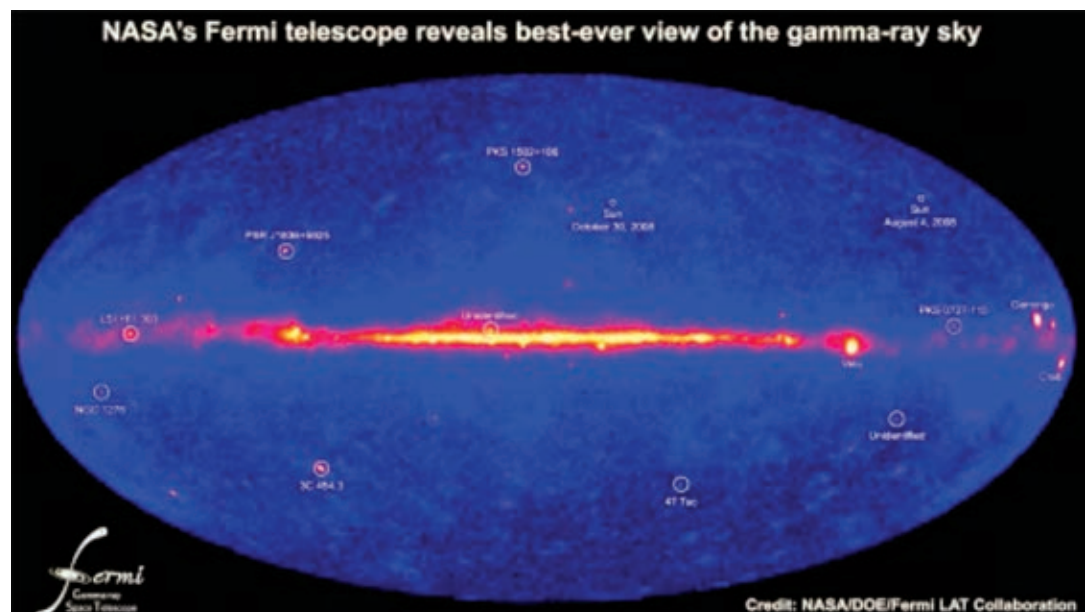
The entire Sky at 1 mm Wavelength – “Baby picture” of our cosmos at 400,000 years; a uniform plasma, hydrogen atoms could not form because it was too hot, electrons are making it opaque, dark matter was present and producing weak condensation that is what the lumps are. Later condensation of dark matter allowed ordinary matter to start collapsing in, to form the

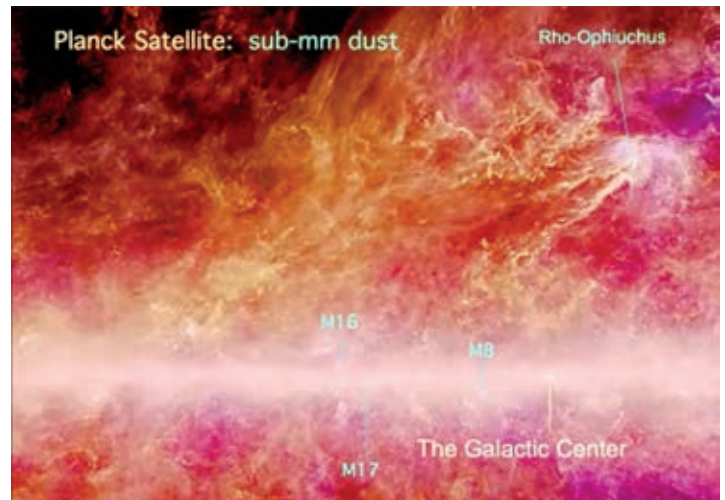
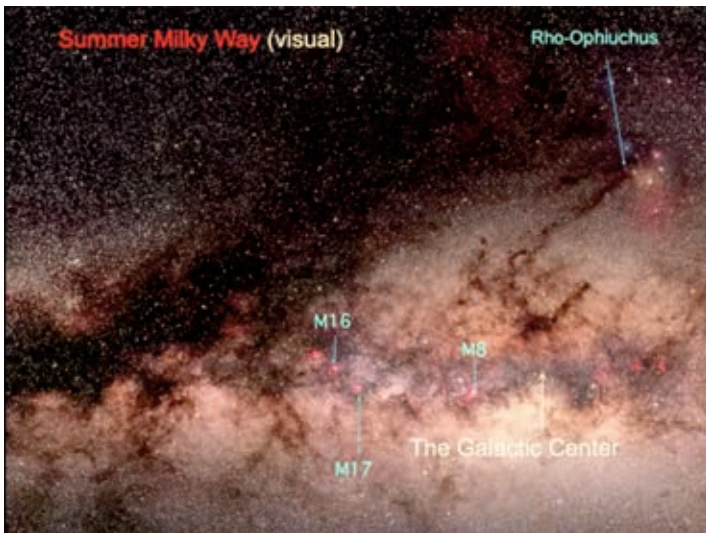
first galaxies and first stars. Today we are 14 Billion years old.

New Image of Milky Way @ X-ray wavelengths (~1nm) Galactic Center has bubble going out of it, bright spot Crab Nebula



Milky Way @ gamma-ray wavelengths (0.001 nm) NASA’s Fermi telescope reveals best-ever view of the gamma-ray sky. Noted point sources are active black holes in other galaxies, accreting matter, producing powerful beams of electrons that radiate synchrotron light and X-ray and gamma ray radiation, the Sun itself is a gamma ray source.

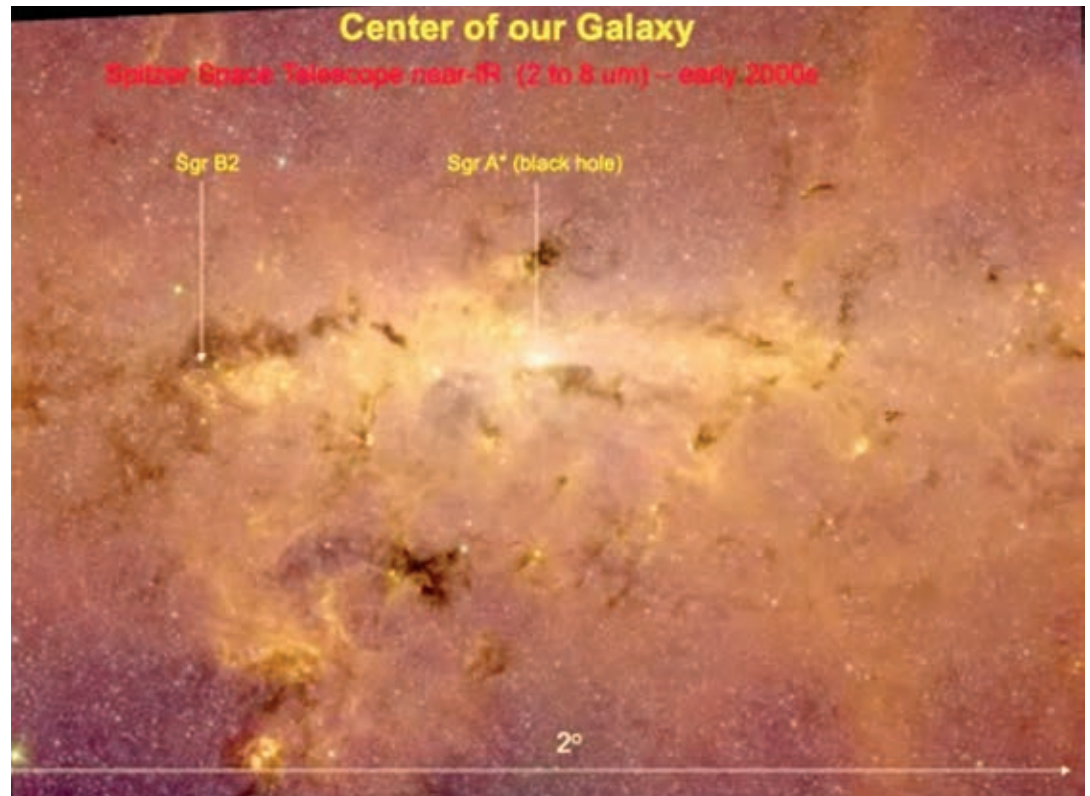


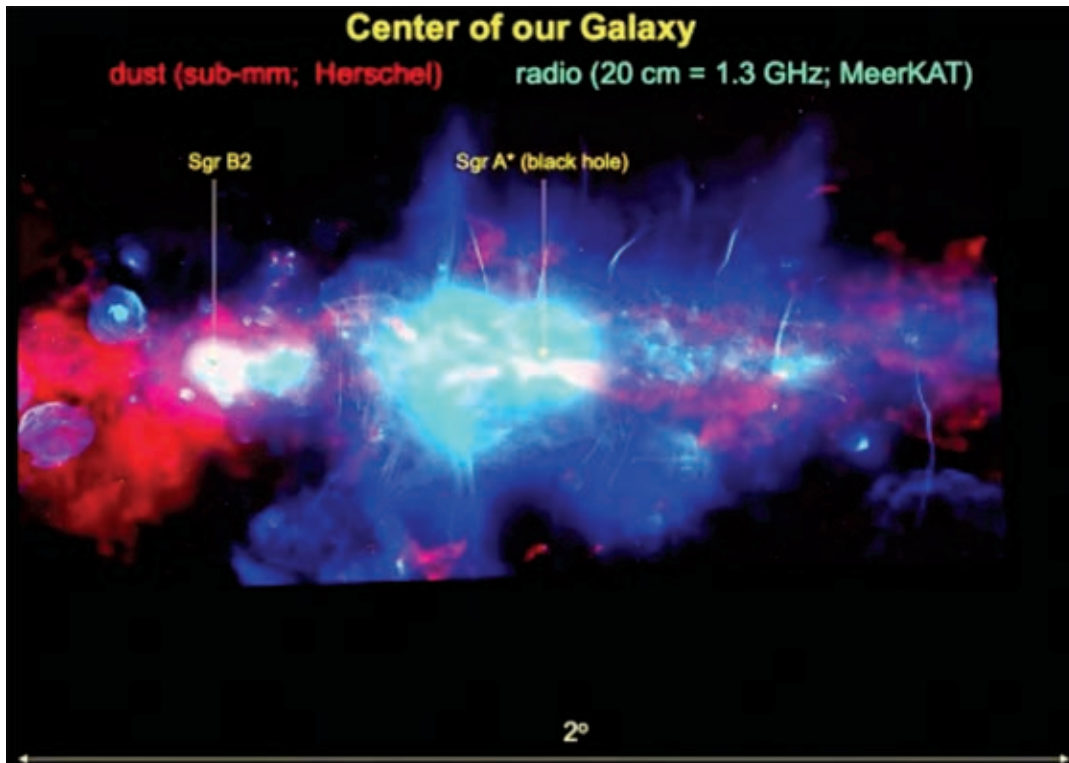


Summer Milky Way - zoom in galactic center (visual)
older view – taken about 20 yrs ago, this region called Rho-Ophiuchus

Infrared view of same field – Stars have disappeared; what is dark in visual is bright in infrared

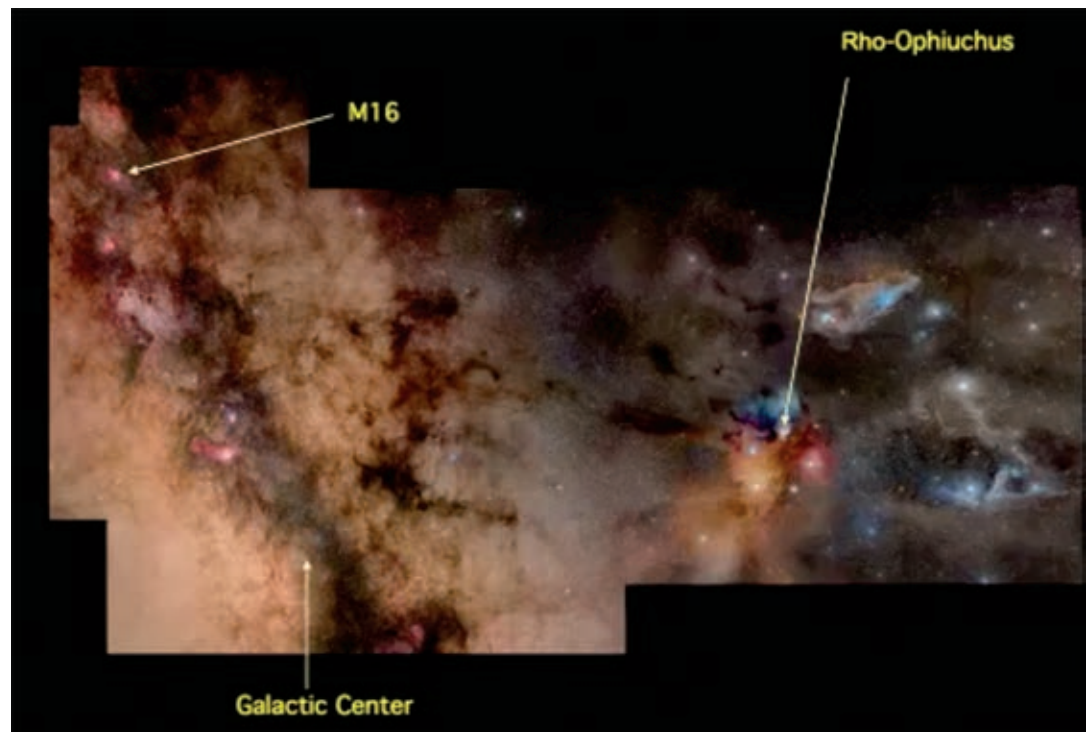
Center of our Galaxy –
near infrared view; some
of star still opaque, black
hole, super dense star
cluster

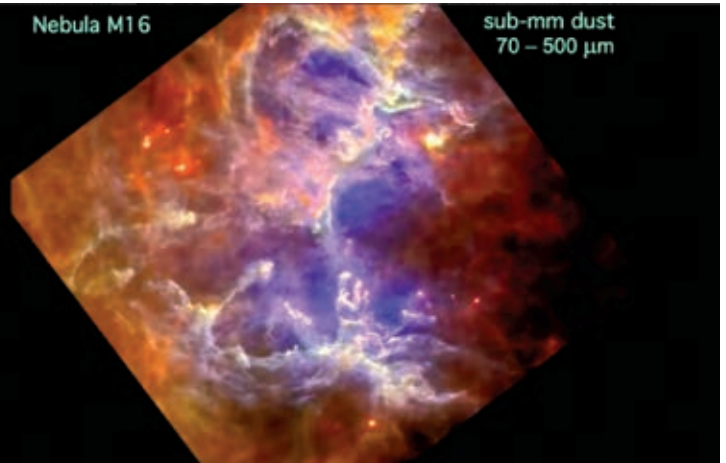




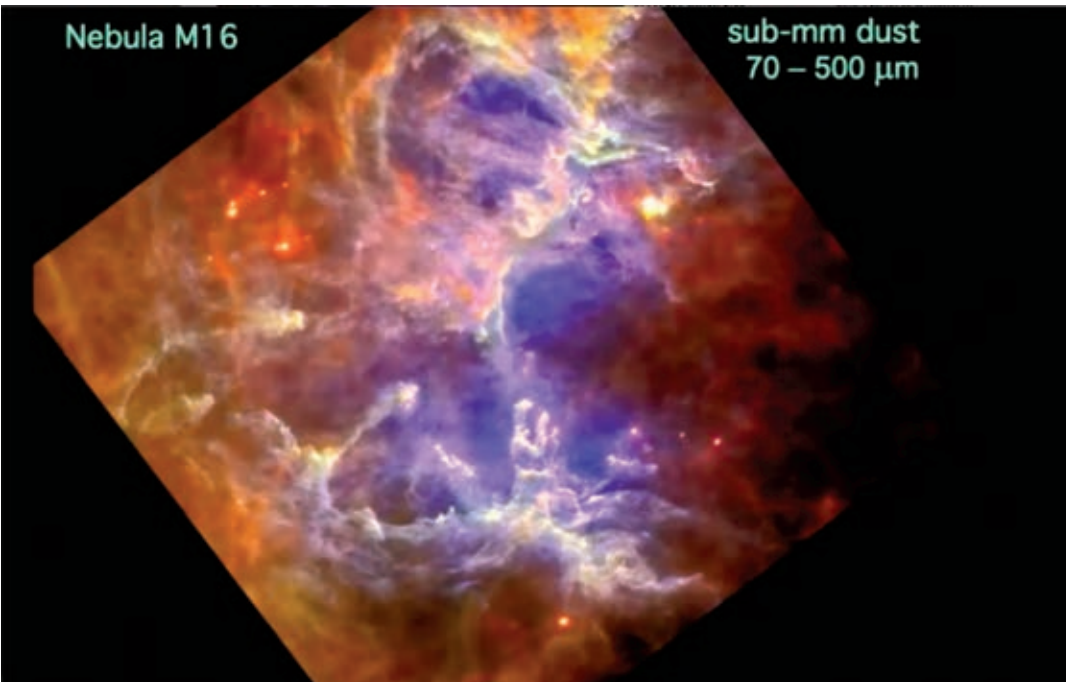
Center of our Galaxy - Go to radio waves; the Australians have built an instrument called MeerKAT, like the large array in NM about 100 dishes; Blue-synchrotron light radio emission at 20 cm wavelengths combined with Herschel Space Observatory; Red; calculated dust column density; weird filaments (threads) are an area of active research – what are these threads?

Zoomed in Rho-Ophiuchus
Same seen by James Webb, can see the features is moving





Nebula M16 All stars are gone, can still see the pillars

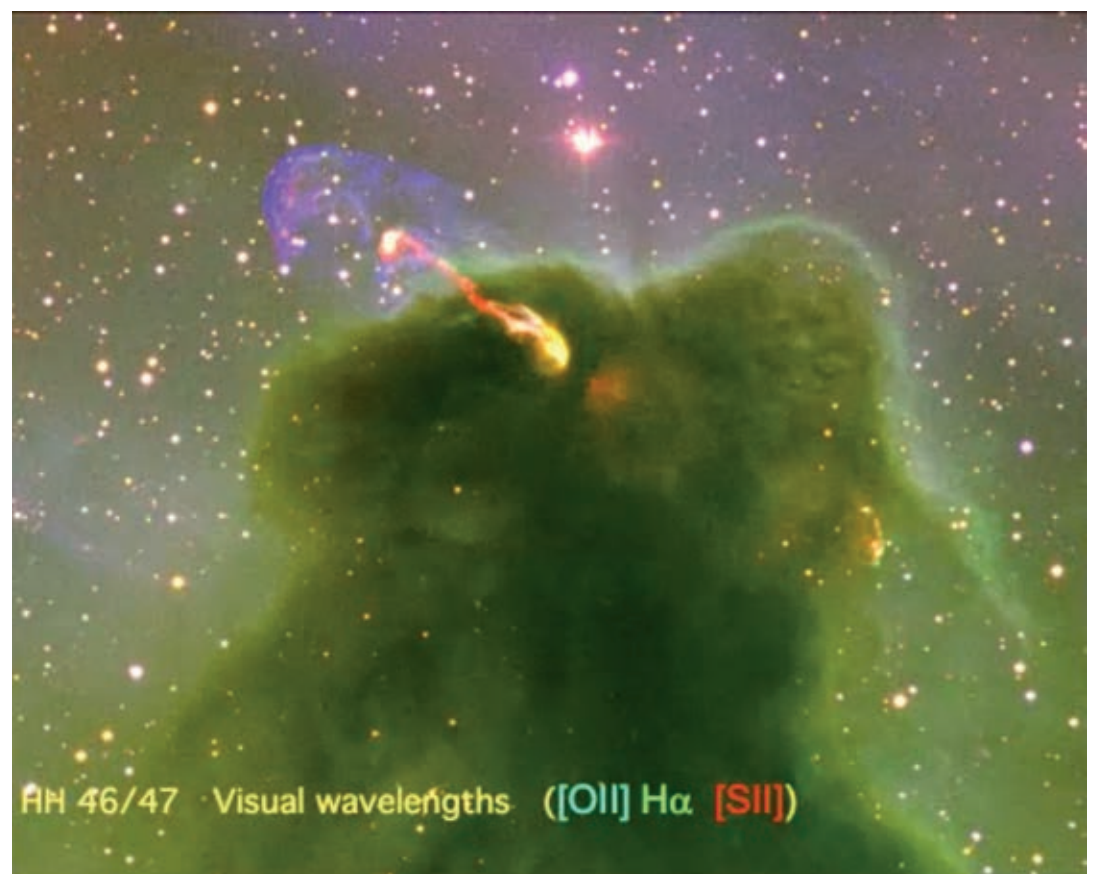


Nebula M16 Pillars are glowing



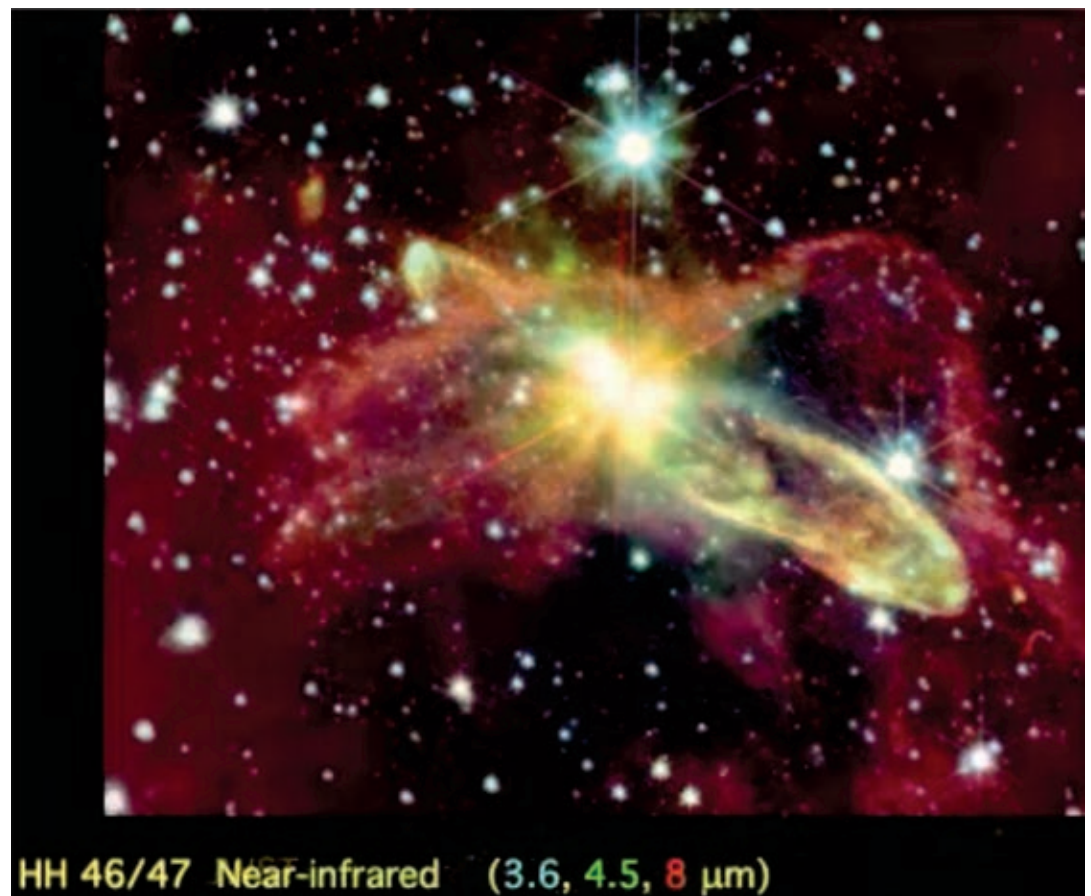
JWST Zooms in on Pillars
in infrared – remnants of
cloud that formed cluster

Shock waves produced
by high-velocity beams of
plasma launched by form-
ing stars (visual)



HH 46/47 Visual wavelengths ([OII] H α [SII])

James Webb view (infrared)



Jets in Orion – things in the sky are not stationary, can see the changes over time

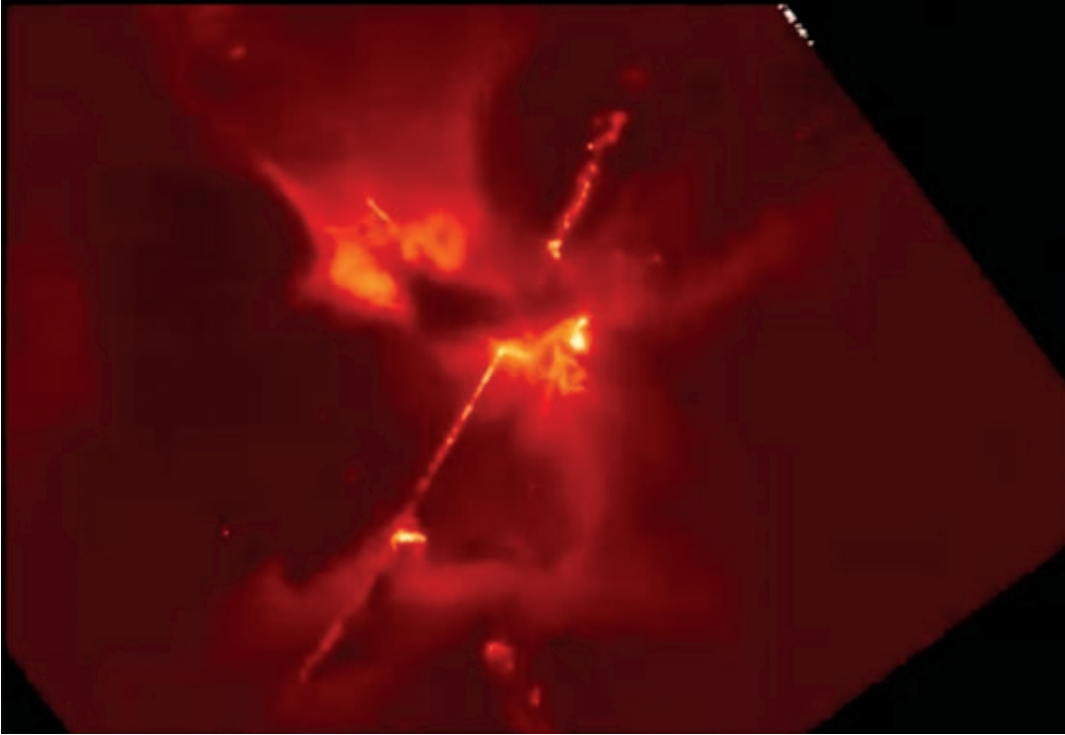


Image not yet published, about to be from JWST, can see 4 jets. We think that no stars are born alone, but born in clusters as rich as the Orion Nebula, fossil records tells us there was a supernova within 1 light year just as Earth was being formed; primitive meteorites give us the evidence

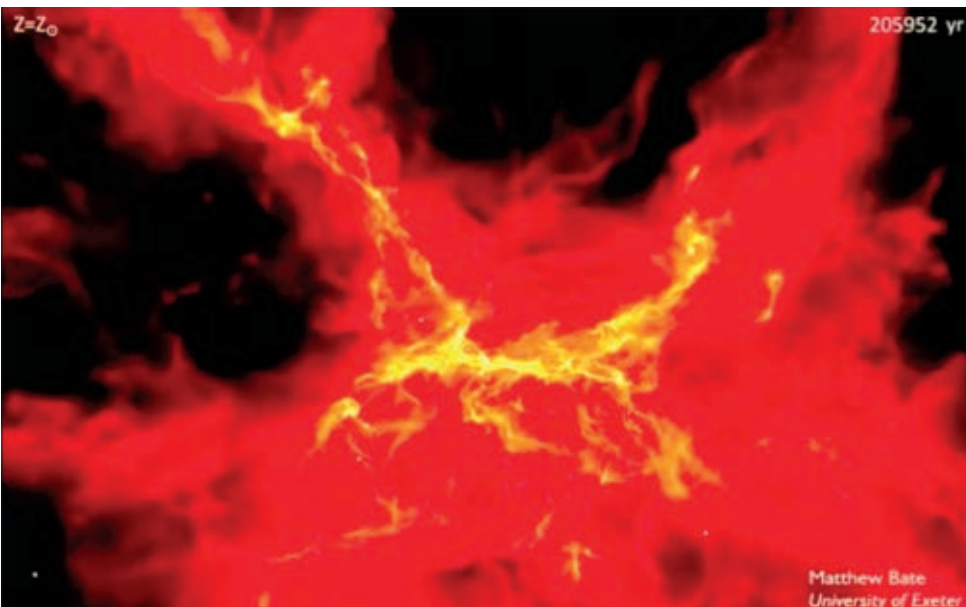
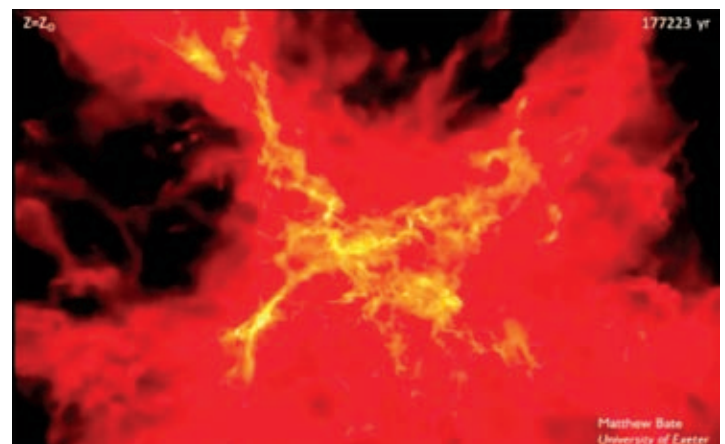
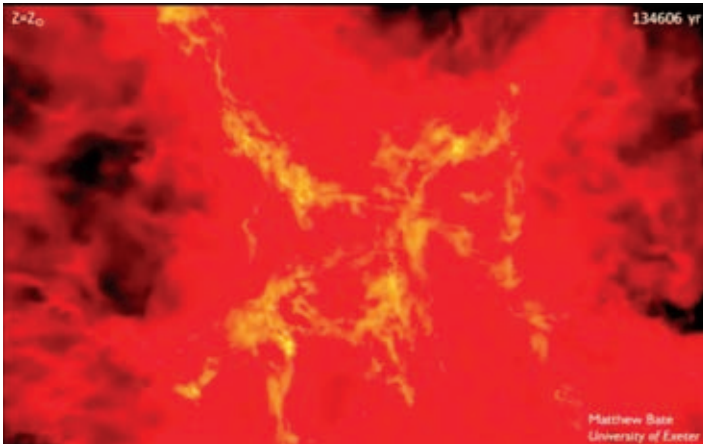


Beautiful JWST edge on image of proto-planetary disc in Taurus, can see the dust where we think planets are being formed today

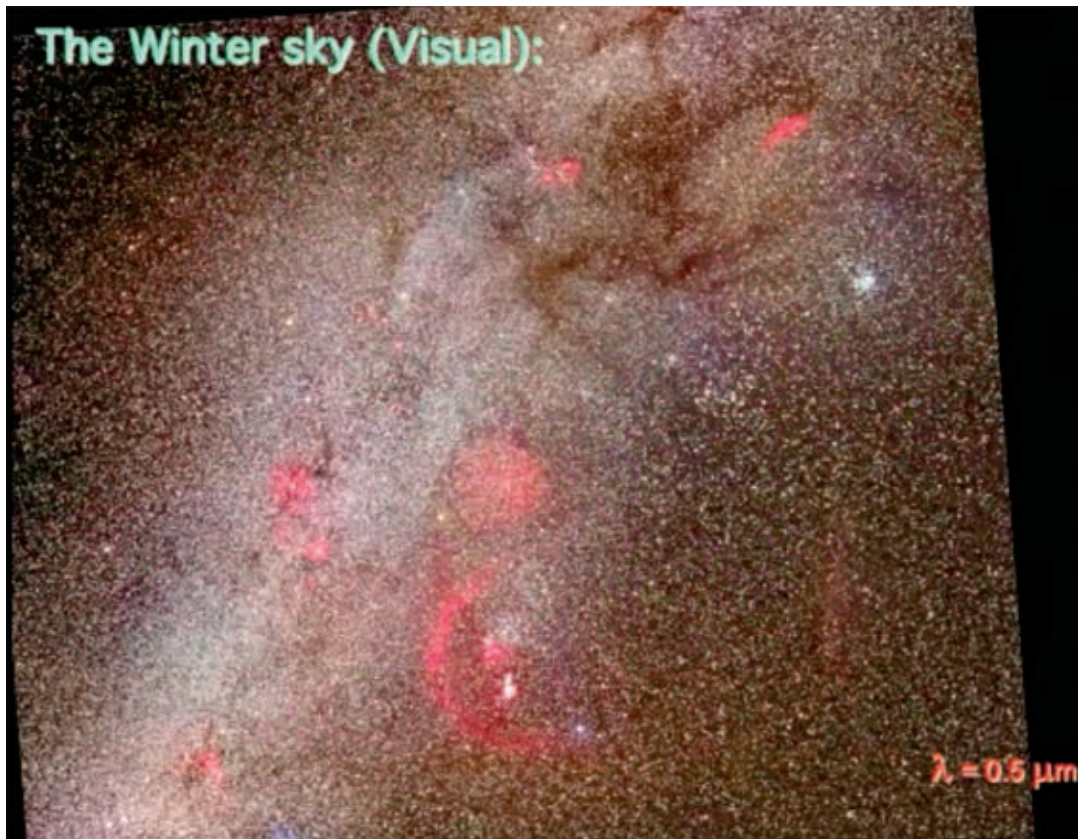
HH 24 jets in Orion [Fell] 2014, 2016, 2024



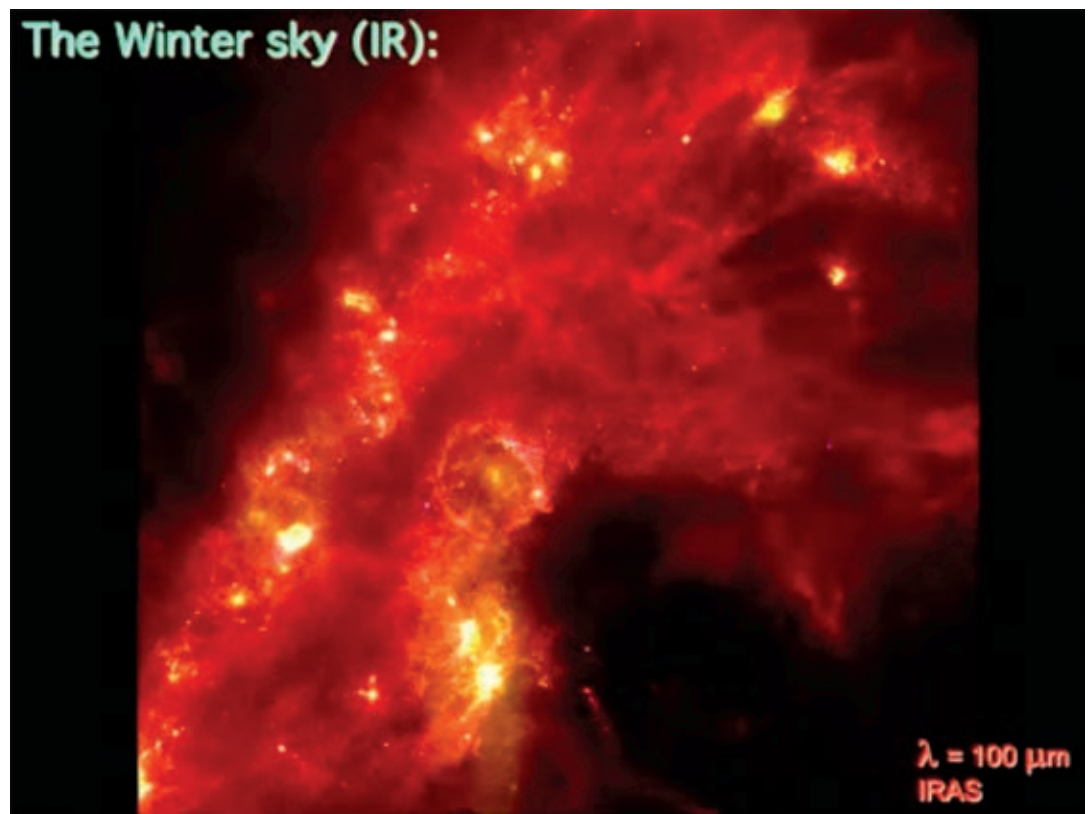
Typical cluster of young stars; see dense field of young stars



(Cartoon by Matthew Bate University of Exeter) shows the evolution of a cloud that is collapsing over about $\frac{1}{4}$ of million years, eventually start seeing white specks being ejected, slowly at first then all of a sudden many stars forming - we think this is how star formation works. Gravitation collapse of giant clouds producing entire clusters, clusters are dynamically unstable and in time most of the clusters lose their gas, lose mass, and stars move away, no longer part of a cluster, now isolated star, ejected from the birth environment.

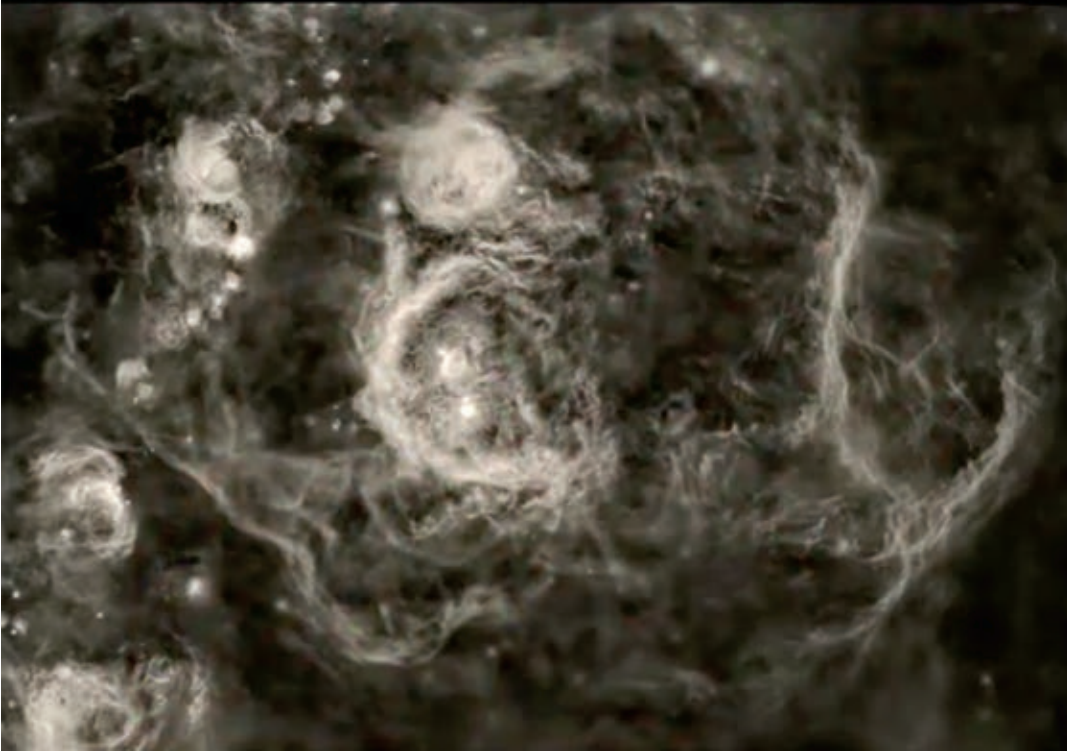


The Entire Winter Sky (Visual) we see Orion Nebula, Betelgeuse, Rigel, California Nebula, Pleiades



The Entire Winter Sky
(Infrared)

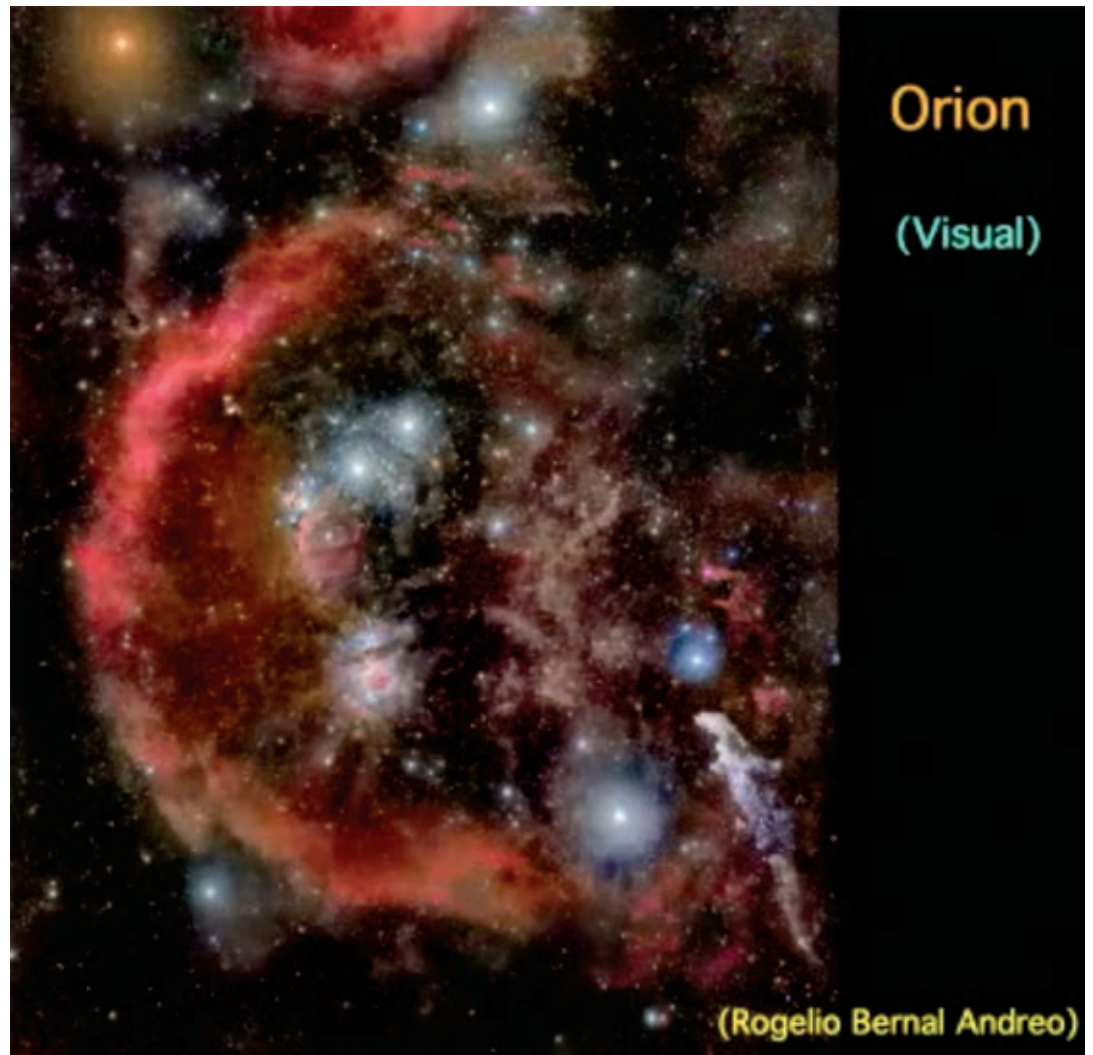
Orion-Eridanus super-bubble: MDW H α survey: Dennis DiCicco, Sean Walker

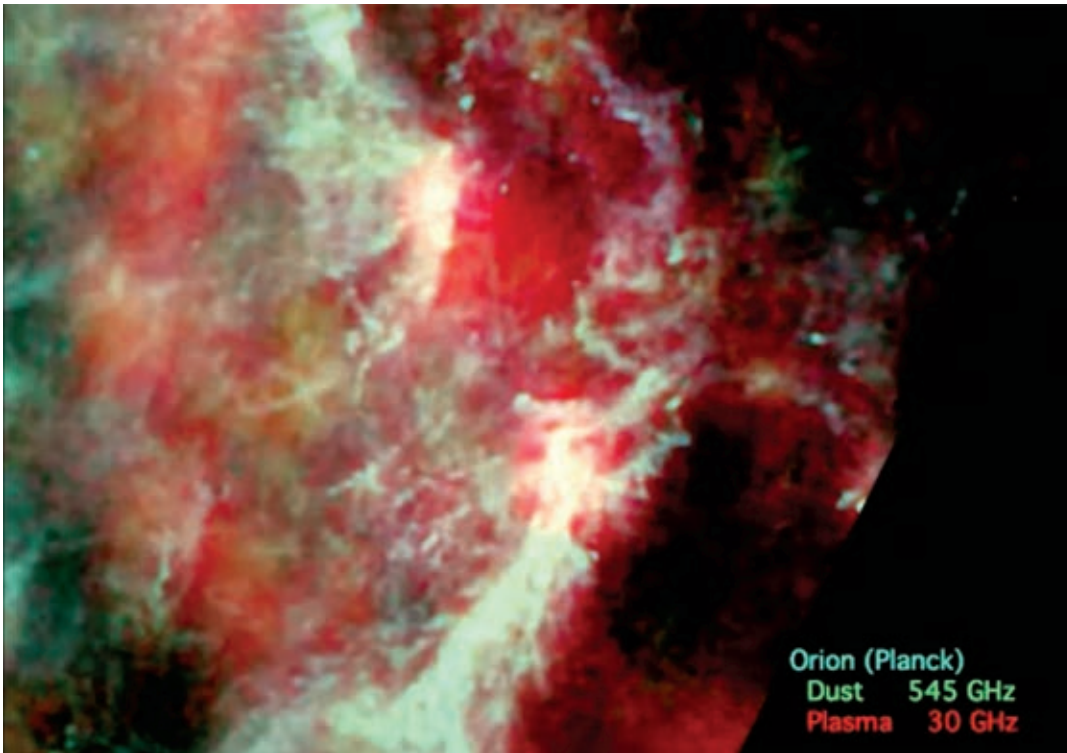


Beautiful Amateur View
Orion-Eridanus super-bubble; see Sirius, Betelgeuse, Barnard's Loop, Orion Nebula, Horsehead Nebula, Milky Way

Orion-Eridanus super-bubble; all stars subtracted except for couple bright stars, Orion has blown a bubble, a consequence of birth and death of massive stars by the dozens in Orion, star formation still continues there in Orion Nebula and Horsehead Nebula

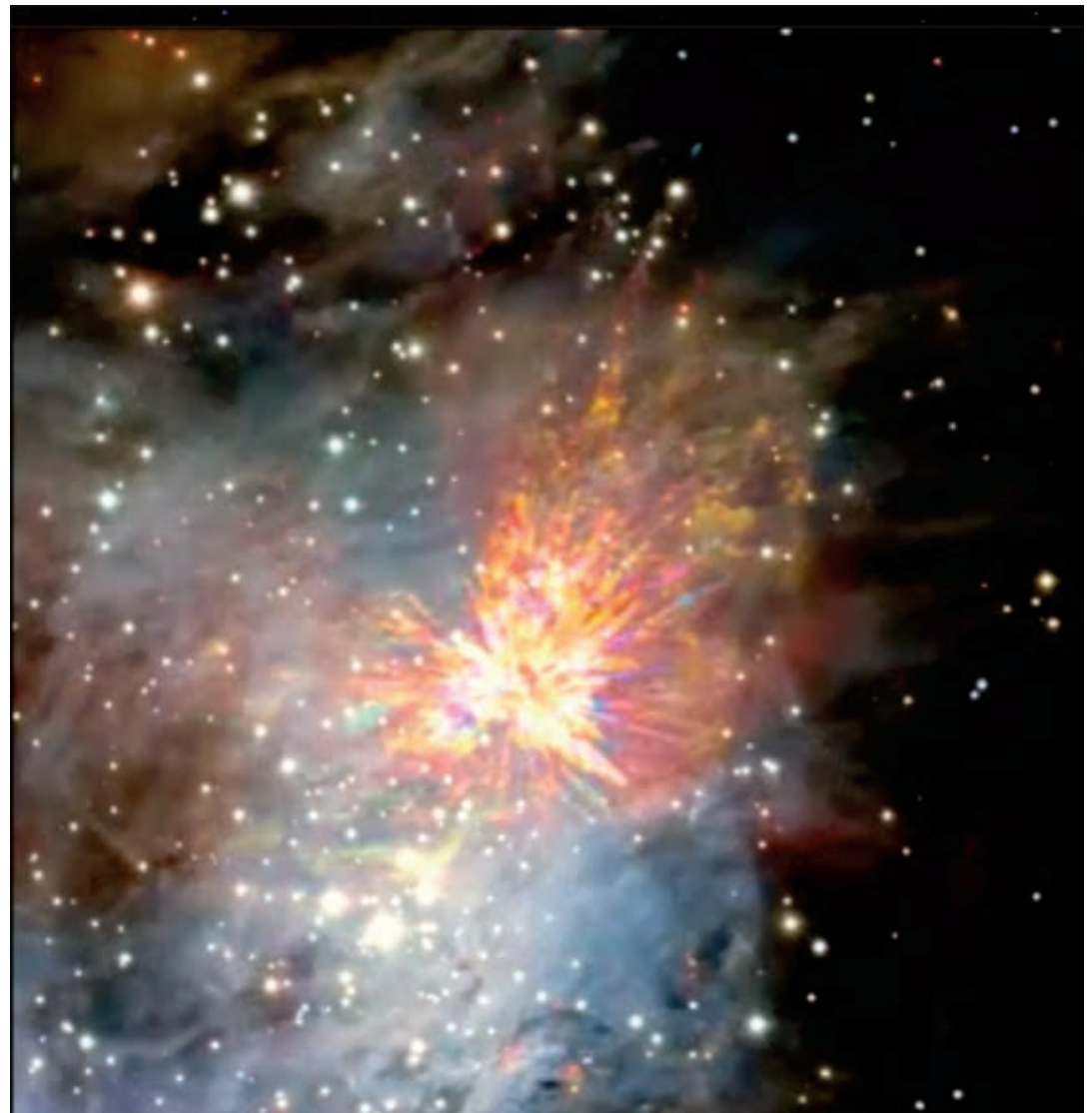
Zooming in on that ...Orion (Visual) see belt stars, Barnard's Loop



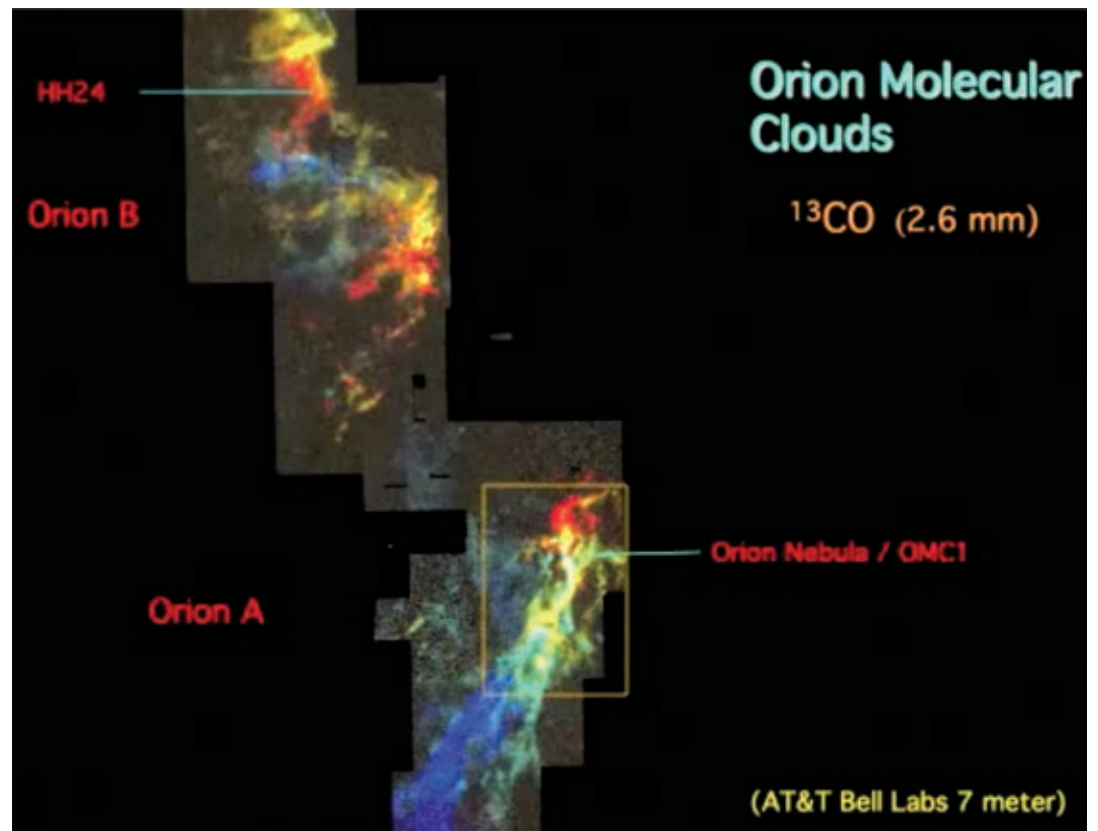


View with Planck satellite
– the green color is dust

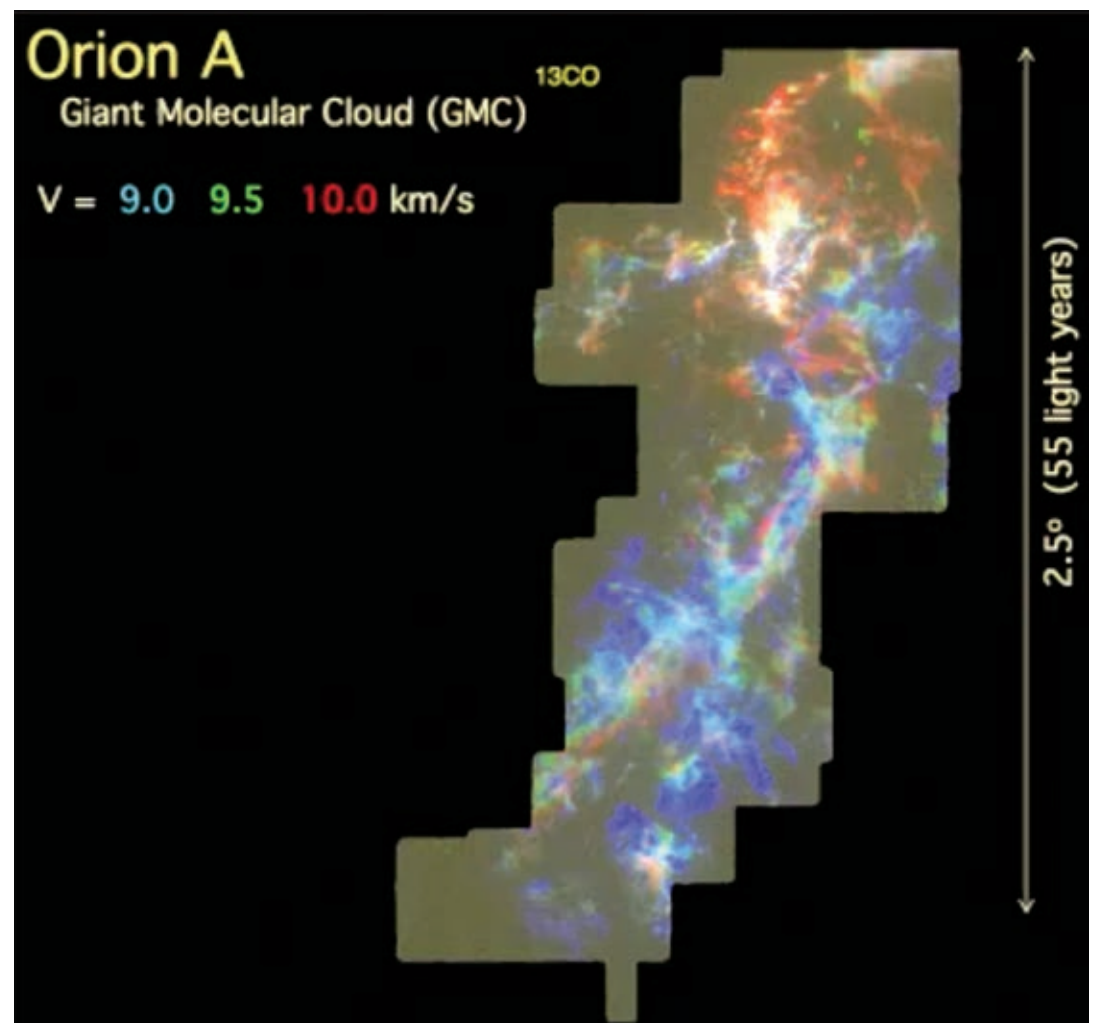
Orion Molecular Clouds
– AT&T Bell Labs view,
tracing the molecule
Carbon Monoxide in
Orion, the colors are
doppler shifts, red
shifted gases colors red,
rest velocity are colored
green, approaching
blues shifted gases
are colored blue - this
is the raw material of
star formation, stars
are still forming by the
thousands in the Orion
Nebula



- Done in the 1980s Orion A Giant Molecular Cloud

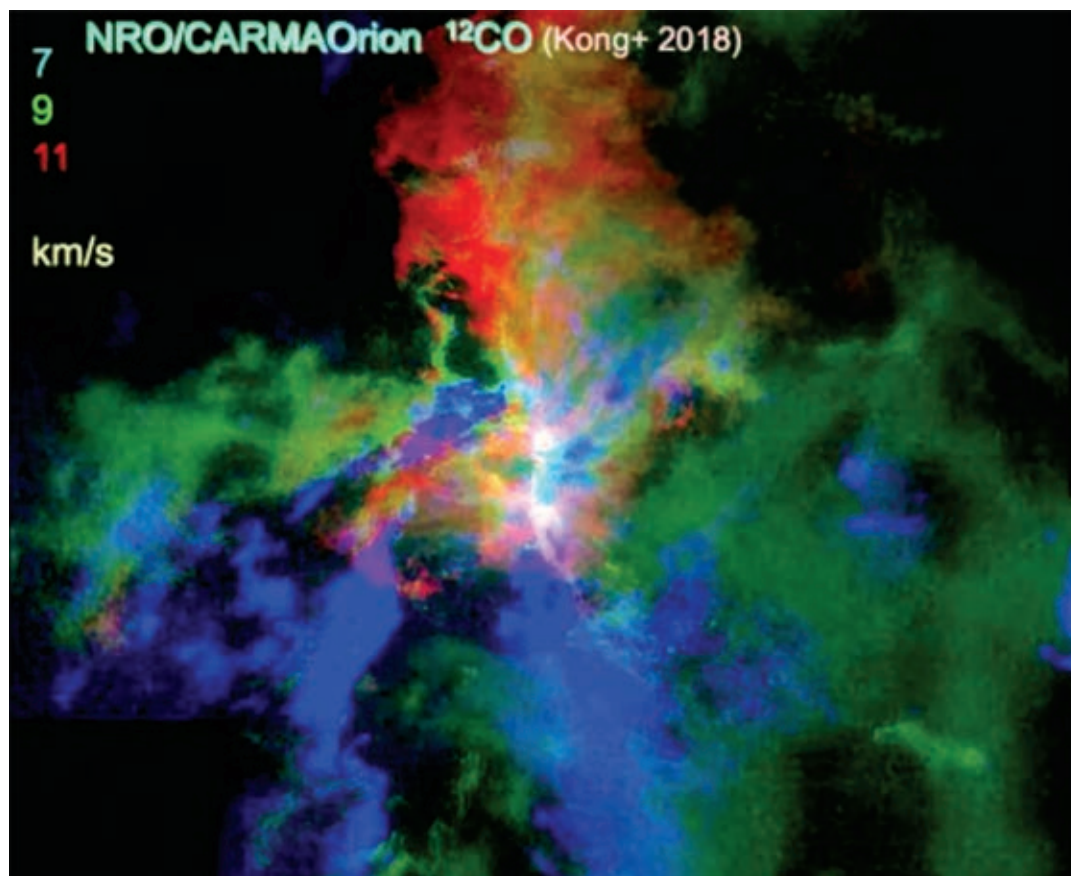


- Orion A Giant Molecular Cloud (GMC)





- Orion Nebula (near-infrared) See dust lane in center area



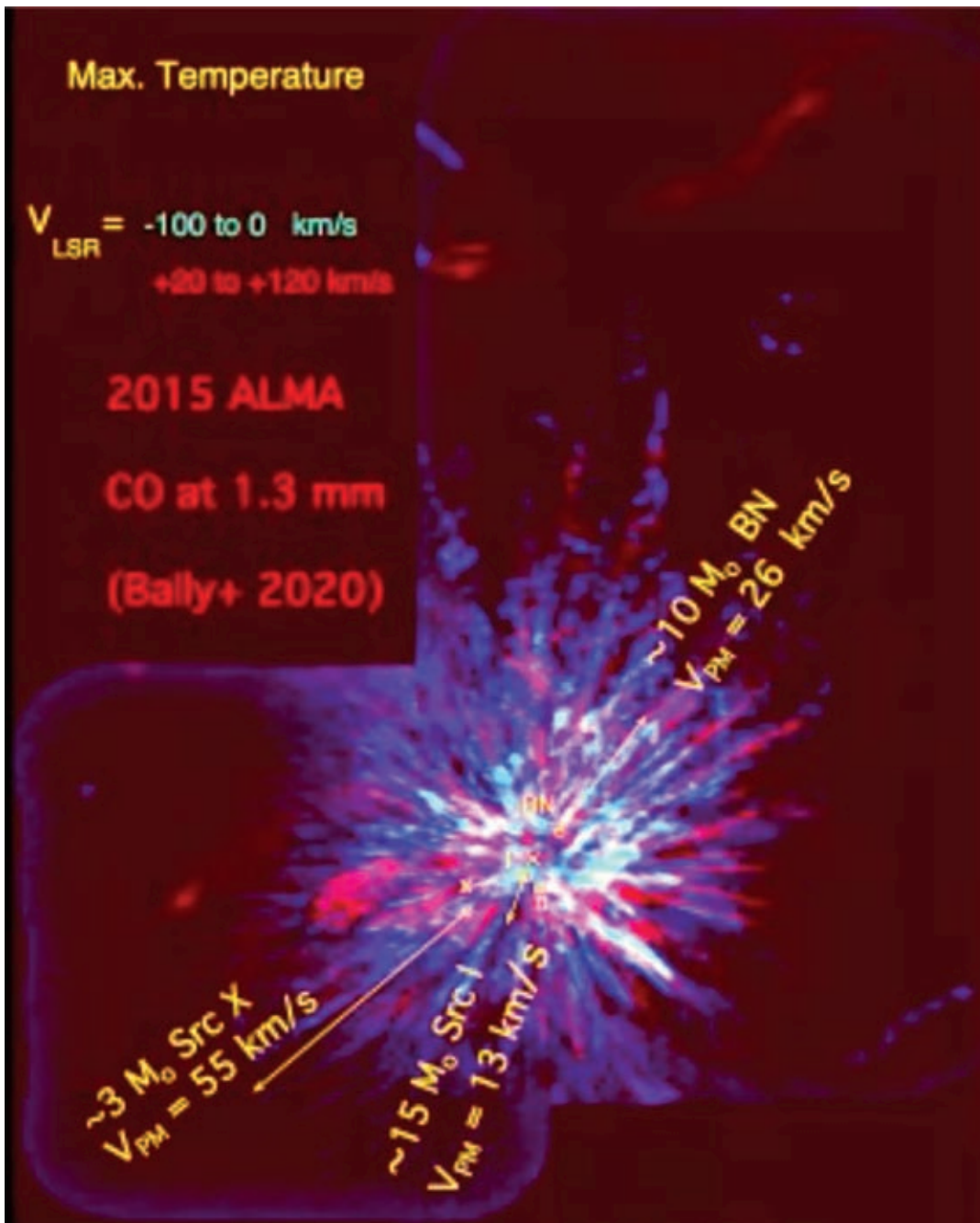
- NRO/CARMA Dust lane shows up in emission in carbon monoxide



- Zoomed in even more...
Trapezium 4-stars that
light up the Orion Neb-
ula



As seen by JWST in 2022



Later went to ALMA (2015)

- Red – red shifted, moving away Blue – blue shifted, moving toward

Explosion happened long ago- 4 stars formed deep behind the Nebula itself, called Orion Molecular Cloud Core 1 – stars interacted, 2 collided and merged, massive output of energy, released more energy than the Sun puts out in 10,000 years! Can only be seen in the infrared, parts of it are approaching us, will become visible in Orion in a few 10s of thousand years.

Dr. Bally ended his remarkable presentation with these thoughts:

This is interesting, it's fun, but why should the average citizen care? Look at the last 400 years, of history and ask yourself – what has driven technology and the economy? Science.. The Industrial Revolution, in my view, is a direct consequence of Galileo and Newtons work on gravity and calculus. It is the physics of mechanics that enabled the industrial revolution to happen. James Maxwell's work in electromagnetic in 1865 predicted light waves and radio waves and a few decades later we had radio, light and telecommunications. It is the quantum mechanics of the 1920s that underlies the physics of your cellphone.

The question I ask is we now know the Universe is made of only 5% ordinary atoms 25% some mysterious substance called *dark matter*. What is it? Now we discover the universe is not only expanding, the expansion is accelerating! *Dark energy*! What is dark matter and dark energy?

I maintain that the quest to identify the nature of those two mysteries is going to revolutionize our technology and our century economy. Why do we do astronomy? It is our clue to understanding nature and ultimately technology is the *exploitation of our understanding of nature's laws*, and we are just beginning to understand those laws now..and that is why we do this.

Questions

- MeerKAT is in South Africa; complex in western Australia?
- You showed an animation of star cluster formation...it seems most open clusters get..do you have any idea what fraction get ejected? Can you hazard a guess as to what fraction of stars remain behind?
- What is your opinion about what is going to happen with Betelgeuse?

III. Business Meeting – Treasurers Report by Bruce Lamoreaux



Longmont Astronomical Society

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

LAS Treasurer's Report - Bruce Lamoreaux

8/20/2026

Main Checking Account (xxx-1587)

Begin Balance:	\$ 4,170.00	6/2/2026
Deposits:	\$ 50.00	Membership
Expenses:	\$ -	
Current Balance:	\$ 4,220.00	7/22/2026

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

Past Balance:	\$ 8,355.00	6/30/2026
Interest:	\$ -	
Balance:	\$ 8,355.00	7/18/2026

Telescope Fund (xxx-0165)

Past Balance:	\$ 1,090.00	6/30/2026
Deposits:	\$ -	
Expenses:	\$ -	
Balance	\$ 1,090.00	7/30/2026

Petty Cash

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

Total Assets **\$ 13,715.00** \$50.00 Up from July

Active Membership:	113
Student Membership:	2
Total	115 Active

IV. Upcoming Events by Aref Nammari

- August 21 - Star party at Rabbit Mountain with Boulder County Parks 7:15 to 9:45 pm
- September 10 - Therapeutic Riding 7:30 to 10:30 pm
- September 12 - Beech Shelter 7:00 to 10:00 pm
- September 17 - LAS Meeting with Dr. Fran Bagenal
- September 18 - Rabbit Mountain 6:30 to 9:00 pm

**THE COLORADO THERAPEUTIC RIDING CENTER PRESENTS
A NIGHT WITH THE LONGMONT ASTRONOMICAL SOCIETY:**

ACCESSIBLE

STARGAZING NIGHT AT CTRC

**THURSDAY SEPT 10TH
START 7:30 PM**



**TO REGISTER
AND LEARN
MORE:**



**ALL
CHILDREN
MUST BE
SUPERVISED
NO PETS**

**RAIN DATE
9.15**

**QUESTIONS?
CONTACT
EXECDIRECTOR@
CTRCINC.ORG**



LBN 614 by Stephen Garretson

A bright nebula in Cassiopeia, this project stalled out in mid-Feb. I stumbled upon it this morning and reworked the data for the attached result. The original FOV from the FLT 132/ASI 2600MM is cropped to about 40% to concentrate on the target object

[24] 600s guided Ha subs
 [30] 600s guided OIII subs
 total integration: 9 hours

ZWO EFW
 Chroma 3nm Ha filter
 Wanderer Astro Mini V2 Rotator
 Bahtinov mask modified Wanderer Astro
 Eclipse
 PLL Sesto Senso 3 focus controller

graph
 ZWO 220 Mini
 Paramount MX+
 from the Beevo Dome
 TheSkyX, SGP, PHD2
 PixInsight, MacOS Photo, Preview

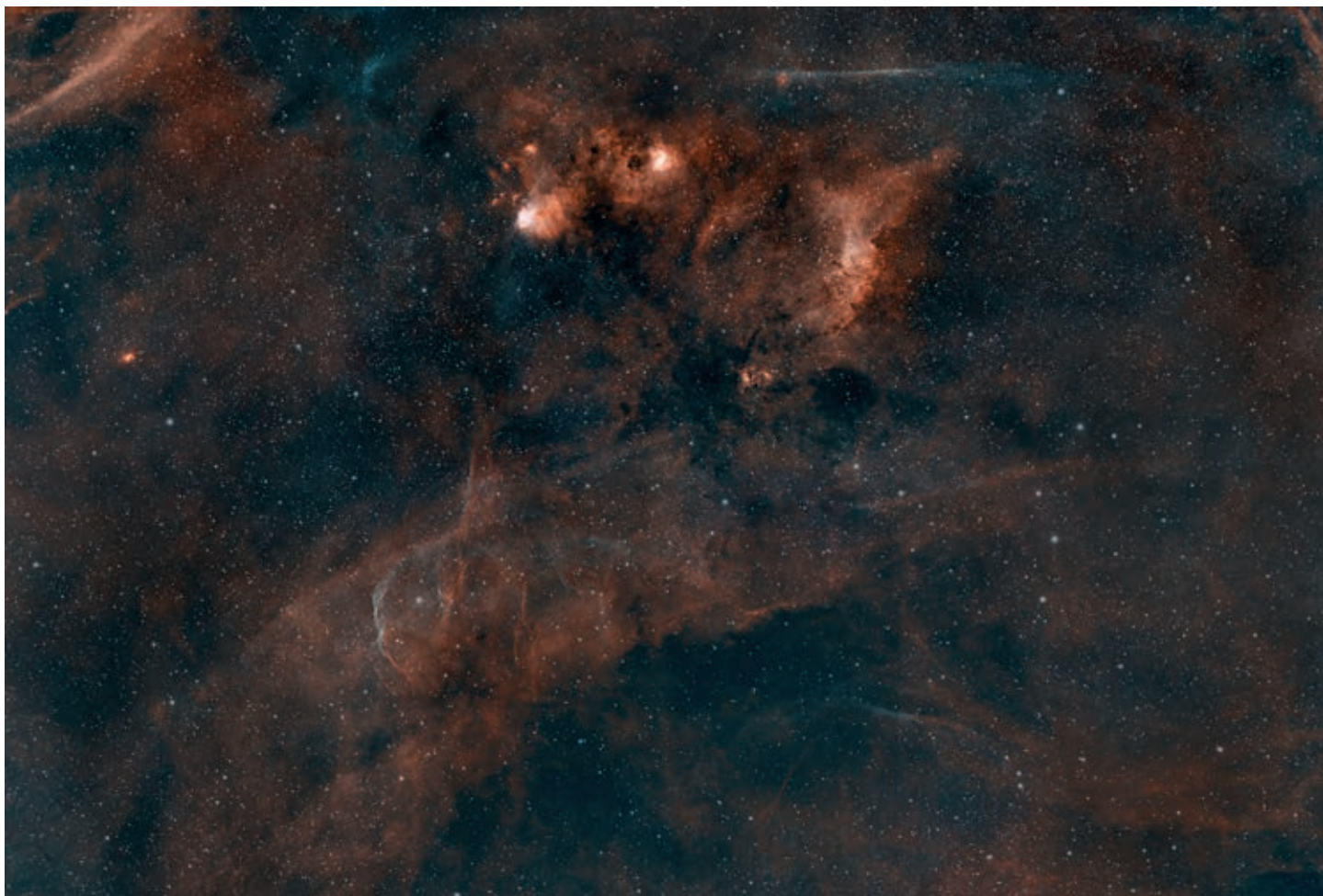
Capture:

dual scopes each having the following components:
 William Optics FLT 132 APO Triplet,
 0.8x reducer/flattener, running at f/5.6
 ZWO 2600MM Pro

Guiding:

William Optics WhiteCat f/4.9 Astro-

...Stephen



LBN 159 in HOO by Stephen Garretson

In Cygnus, this is an area between Sadr and Alberio, near Sh2-98. I'm posting the HOO version as I have been waiting for a good chance to gather any SII that might be in the target area, thwarted by Moon, clouds, position, etc.

[24] 600s guided Ha subs
 [12] 600s guided OIII subs
 total integration: 6 hours

Capture:
 dual scopes each having the following components:
 William Optics FLT 132 APO Triplet, 0.8x reducer/flattener, running at f/5.6
 ZWO 2600MM Pro
 ZWO EFW
 Chroma 3nm Ha filter
 Wanderer Astro Mini V2 Rotator
 Bahtinov mask modified Wanderer Astro Eclipse
 PLL Sesto Senso 3 focus controller

Guiding:
 William Optics WhiteCat f/4.9
 Astrograph
 ZWO 220 Mini
 Paramount MX+
 from the Beevo Dome
 TheSkyX, SGP, PHD2
 PixInsight, MacOS Photo, Preview
 ...Stephen



Sh2-150 by Stephen Garretson

Sharpless 2-150 is a bright nebula in Cepheus; the prominent star near the top left of center is 26 Cephei, a yellow-white supergiant ~ 8.43 X the Sun. Sh2-150 is almost devoid of OIII, is Ha rich, but also has a strong SII emission line that occupies largely the same space as Ha. I tried several different color mapping approaches with the aim of bringing out the two sets of structures. I finally combined three different treatments and had to call it a day. Ha data is from 2024; SII data from 2026; and OII data is from both years. I always record the center star that I slew to in my notes, so matching the FOVs from the two years was easy, FOV is cropped to $\sim 70\%$ of original area.

[24] 600s guided Ha subs	Chroma 3nm Ha filter	from the Beevo Dome
[12] 600s guided OIII subs	Wanderer Astro Mini V2 Rotator	
[23] 600s guided SII subs	Bahtinov mask modified Wanderer	TheSkyX, SGP, PHD2
total integration: 9 hours 50 minutes	Astro Eclipse	PixInsight, MacOS Photo, Preview
	PLL Sesto Senso 3 focus controller	...Stephen

Capture:

dual scopes each having the following components:

William Optics FLT 132 APO Trip-let, 0.8x reducer/flattener, running at f/5.6

ZWO 2600MM Pro

ZWO EFW

Guiding:

William Optics WhiteCat f/4.9

Astrograph

ZWO 220 Mini

Paramount MX+

Lunar Eclipse on Aug 27/28 by Gary Garzone



Took lots of images from start to finish, with 8-inch scope and Canon Rebel digital camera.
Hard to focus super bright moon then shading moving across surface.

Focus off but you get the shadow moving across the moon.

cheers. Gary





Fetus Nebula by Mike Hotka

All...

Attached is an image of the Fetus Nebula, taken with my Seestar on Thursday night from my driveway in Broomfield. I like MJ's image better ;-).

You can see some of the details in my image that MJ's shows a lot better.

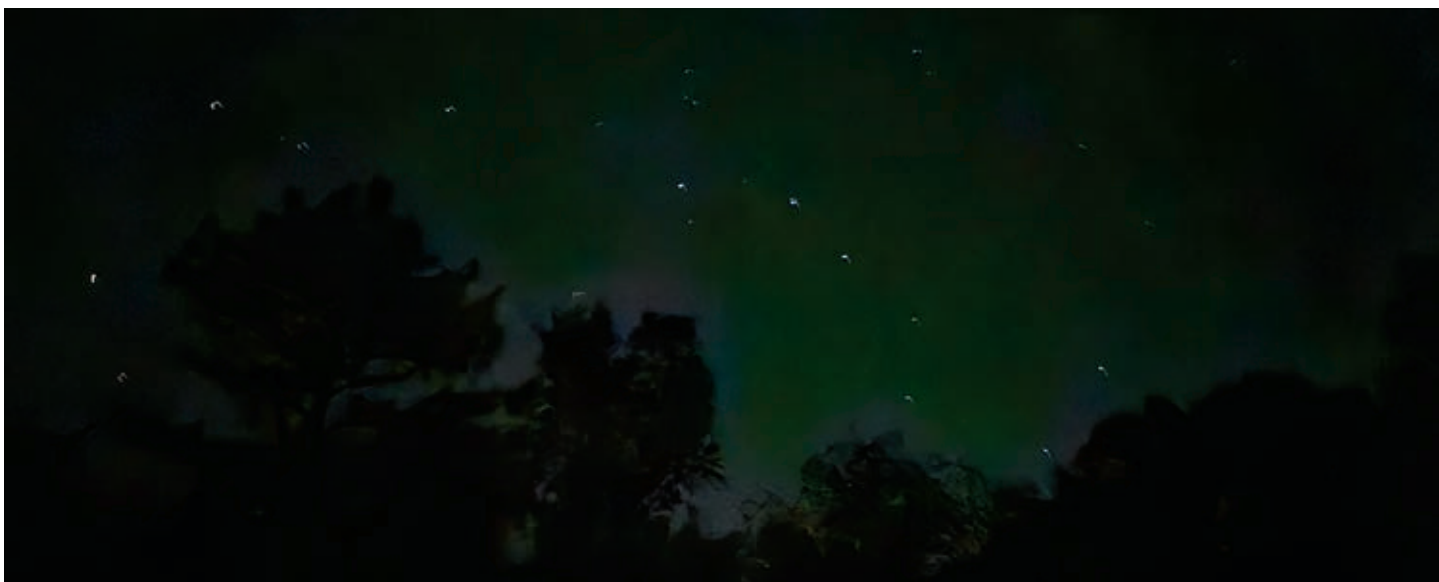
Pretty cool.

Mike



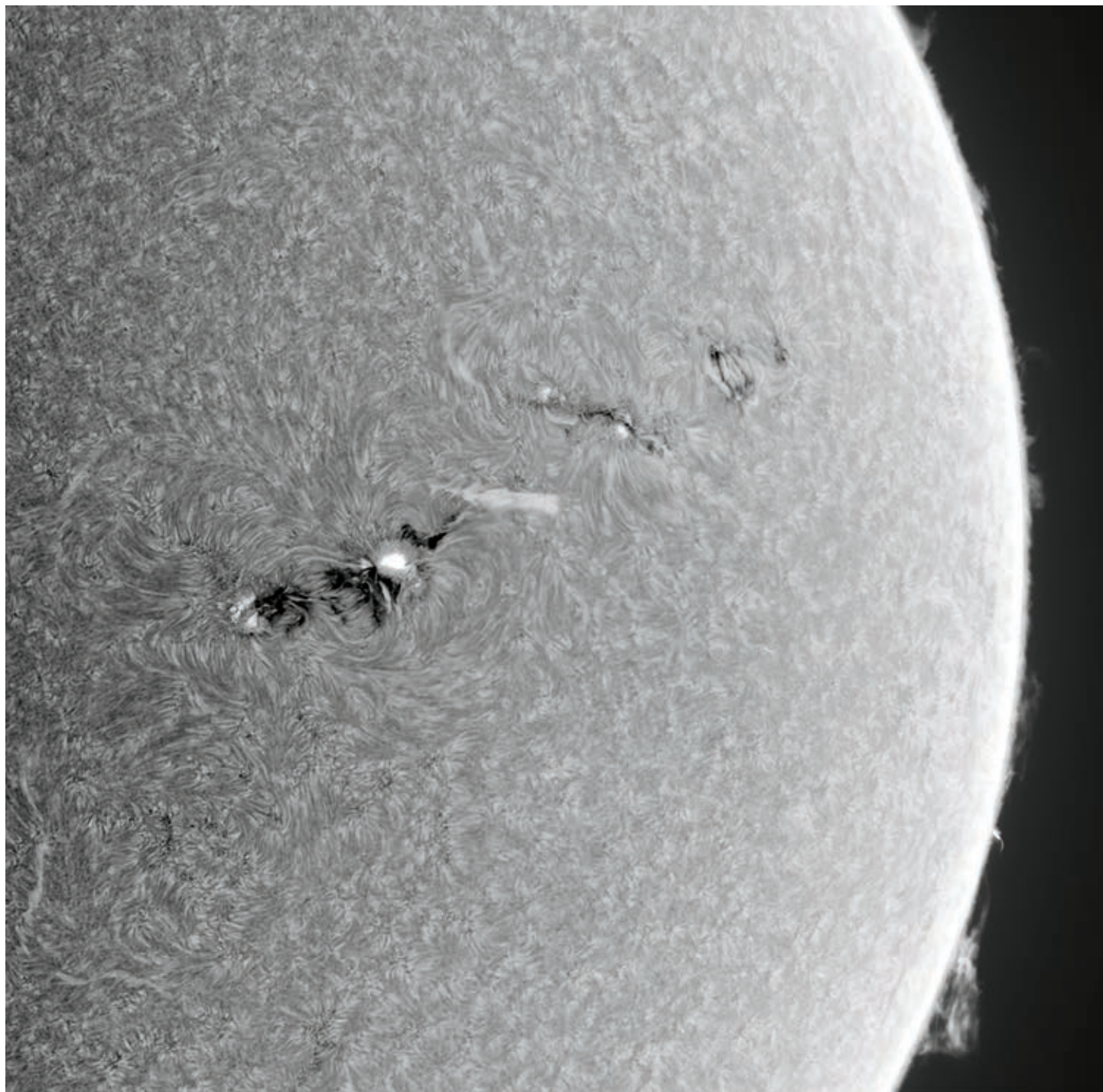
Lunar Eclipse by Reed James

My eclipse photo from last night -- I tried to find one at a similar time as Brian's (using position of top lite limb) -- taken with canon r5, 100-400mm zoom at 400mm, f/9, iso 4000, 0.5 sec -- Edited in LR classic, used AI denoise (really works great for high iso shots!), added linear gradient at top to reduce white glare, added linear gradient at bottom to slightly lighten the lower limb, adjusted WB from 4000 to 5500K -- Overall, I think its very similar to Brian's. Enjoy, —Reed



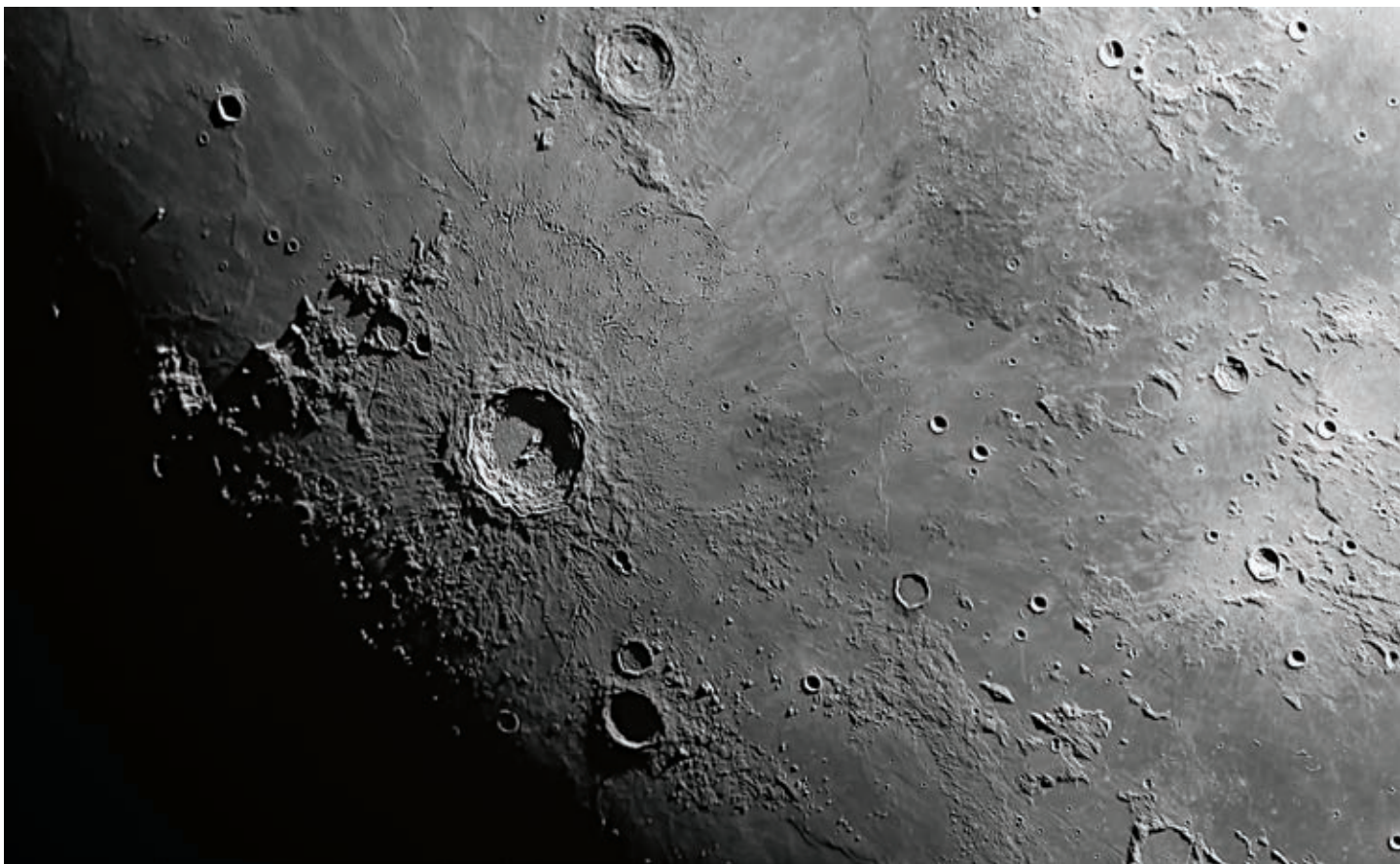
Double Header during Eclipse by John Warren

I had Aurora, just noticeable naked eye and easy to see with my shaky handheld phone. Fun stuff from my backyard west of Longmont.



AR 4506, 4507, and 4508 on August 12 by Brian Kimball

Seeing was excellent.

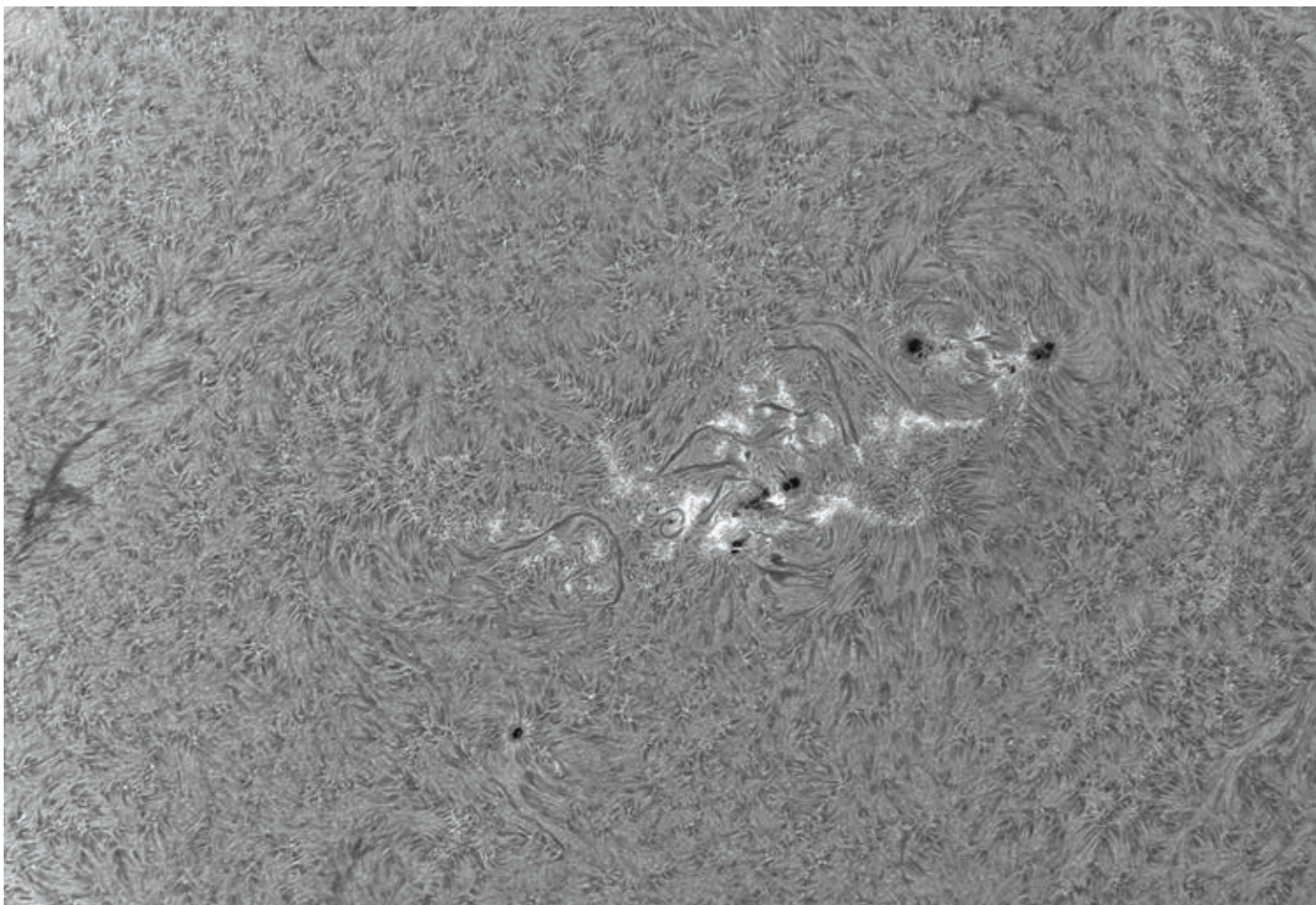


Copernicus secondary cratering by Brian Kimball

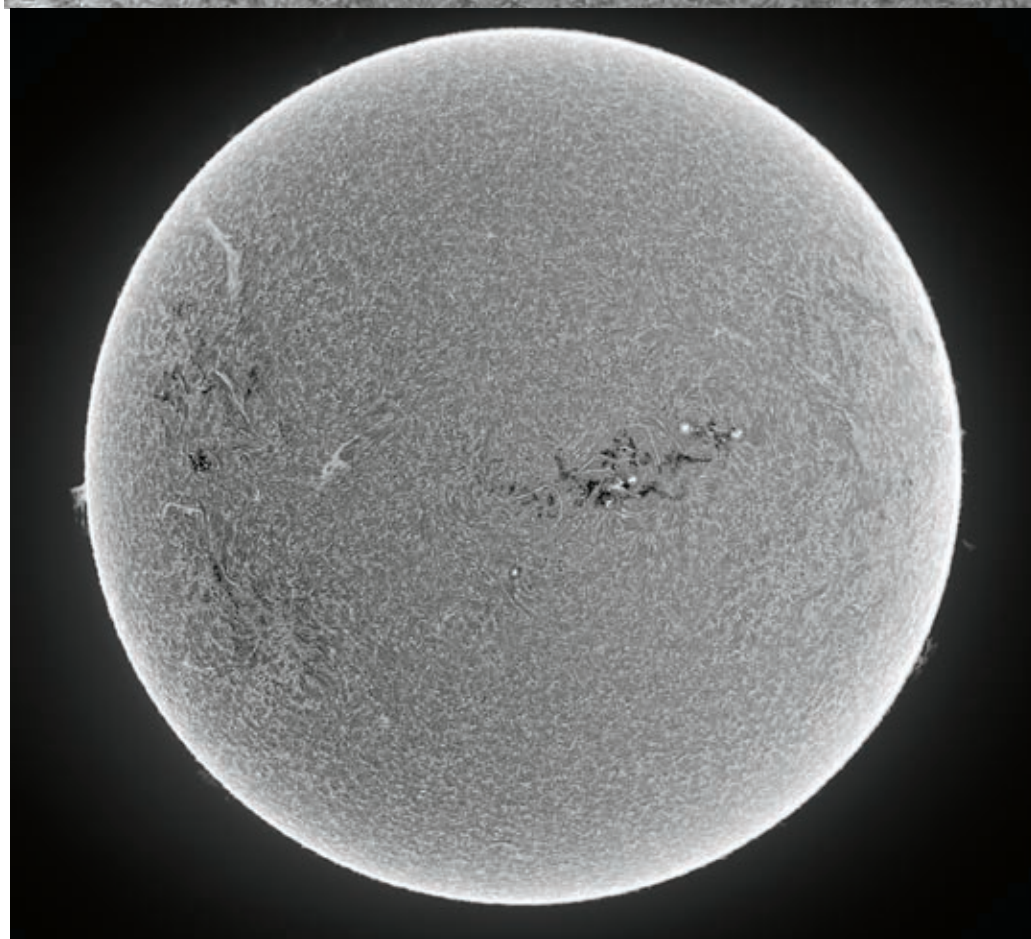
Copernicus is surrounded by hundreds of small pits, some aligned radially to the crater, others dispersed in loops and clusters. Especially along the secondary chain that lies between Eratosthenes and the eastern end of the Carpathian Mountains. Given the impressive number of secondary pits around Copernicus, it is surprising that only around 2 percent of the volume of lunar rocks that were excavated to form the main crater made secondaries. The remaining material was either pulverized into pieces too small to produce secondary craters or was ejected at speeds great enough to escape the Moon's gravitational hold. Almost certainly some of Copernicus's ejecta rained down on the Earth a billion or so years ago. Thanks for looking, Brian Kimball



Lunar Eclipse on August 27 by Brian Kimball



**Above: AR 4513, 4515 and
4517 in H-Alpha on
August 26
by Brian Kimball**



**Left: Full disk H-Alpha on
August 26
by Brian Kimball**



M 16 by Tally O'Donnell

This is an SHO image with 50 minutes exposure with each filter. With the monsoon this year it is difficult to get much time on objects to photograph. Tally



DWB objects in Cygnus by Tally O'Donnell

This is three hours in SHO with DWB 40 in the center of the image in Cygnus. I count 25 of the DWB objects in this one image (as well as other well know objects). Tally



A good kind of Splinter (NGC 5907) by Jim Pollock

Hi All,

While I'm still in my f/7 configuration of my 9.25", I've been having fun at the Texas site shooting galaxies, especially irregular or interacting (collision!!!) galaxies. And I am still amused with the catalog called Halton Arp's Atlas of Peculiar Galaxies. Sounds like something from Monty Python (e.g. The Ministry of Silly Walks).

I particularly have a fondness of edge-on galaxies such as Gary's favorite NGC 4565 and various others with monikers such as the Needle, the Knife Edge, the Cigar, and the Spindle.

Here's one more: The Splinter! NGC 5907 is about 47 Million Light Years from Longmont tucked into the Constellation Draco.

This image is 22 frames of 5-mins (2 hours exposure) in my 9.25" EdgeHD at f/7 into ZWO 2600mc duo color camera, with nearly no moon.

Always amazed!

Jim



Largest Pacman in the Galaxy by Jim Pollock

Yes, this has to be the largest Pacman in the Galaxy. Fortunately, our Pacman has mended his ways and is now creating stars rather than munching on them. NGC 281 (Pacman Nebula) is a bright emission nebula in Cassiopeia. It is right at the same apparent size as a full moon. Interestingly, the Pacman contains several Bok Globules (dark, dusty, gassy nebular blobs) floating through the H II. Lots of fun structures to look at.

Shot last night in Texas with a near full moon with my 9.25" EdgeHD at f/7 to a ZWO 2600mc duo. 39 frames of 5-mins each for 3.3hrs of total exposure.

Always amazed,

Jim



A Space Bubble by Jim Pollock

Hi All,

This is my first time trying to image The Bubble Nebula (NGC 7635, Caldwell 11) which is a way cool object... like some giant blowing a bubble through a cloud of smoke. Red smoke. Hydrogen smoke. Visually, you can get a hint of the bubble with an 8" scope under dark skies, but ya need a 12-16" to pop it.

This image is 30 frames of 180sec (1.5 hours) from last night at Starfront Texas with my 9.25" EdgeHD at f/7 into a ZWO 2600mc duo color camera.

Always amazed,

Jim



A Dark DooDad in Cassiopeia

I saw this interesting collection of objects in one of Bob Fugate's Magdalena club postings several months ago. The dark nebula is LDN 1332 while the open cluster of stars is NGC 654. The reflection nebula that appears adjacent to NGC 654 is vdB 6. The bright objects lie about 7800 l.y. away, while the dark nebula is likely closer by 700-3000 l.y. Milky Way stars abound throughout the frame, about 10,000 of them according to PixInsight (I did not count to verify)

From DSNM last night, CDK14 scope, OSC camera, 2.5 hours exposure time, 3.3 x 2.2 deg field of view.

M.J. Post



**Comet 220P/McNaught on August 12
by Paul Robinson**

To all comet enthusiasts,

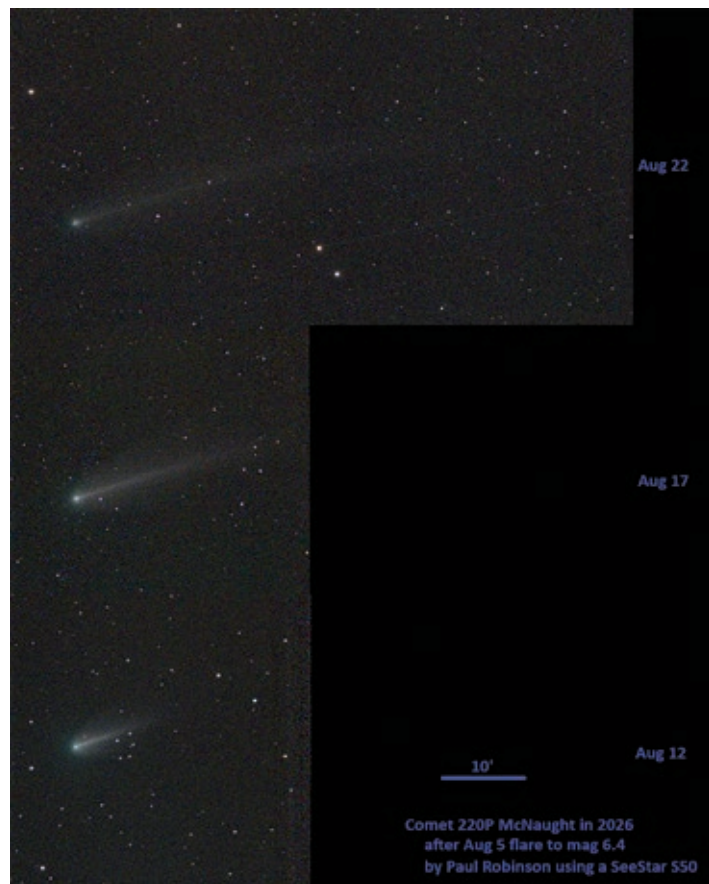
This comet (220P) is around 7th mag after two major outbursts that brought it up from mag 17 in the last few weeks. Currently it is in the head of Cetus (50 deg high in the SE in the morning sky).

This morning (Wed Aug 12) I was able to glimpse it in my 25x100 binos as a slightly elongated smudge. At times I thought maybe I could see a spine.

I used my SeeStar S50 to get a 7-minute exposure consisting of 10-sec subs. The comet will fade in the coming days to weeks unless it flares again.

That is all for now,

Paul



**Comet McNaught 220P continues (Aug 22)
by Paul Robinson**

After its Aug 5th flare to mag 6.4, this comet grew a neat tail which has been lengthening and fading since. On Aug 12, 17 and 22 (this morning) I imaged it using my SeeStar S50 at about 4:30 am from my back yard in Longmont, CO.

The attached image shows its history so far.

It will remain well placed in the morning sky for a while. Hopefully it will flare again!

Paul Robinson
Longmont, CO
LAS

LAS Archives for Sept. 1996, 2006, and 2016 by Eileen Hall-McKim

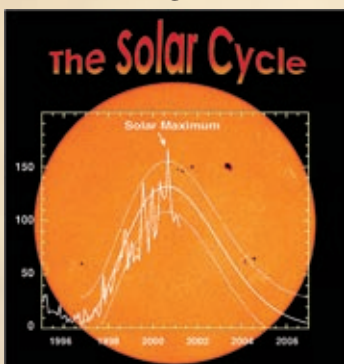
LAS Archives Sept. 96'06'16'

30 Years Ago – 1996

Bob Spohn (President LAS) returns as newsletter editor. "My, it's been a long time since I have written this column. I hope it's like riding a bike! Thank you all for your confidence in me – it's good to be back. Well, fall is upon us already – we are in that magical month of September. The skies traditionally are clear this time of year, and the nights are still warm and getting longer (yeah!) This is a good time for some lingering farewells to our summer favorites and becoming reacquainted with the winter sky, dominated by the reappearance of mighty Orion!"



20 Years Ago – 2006



The Solar Cycle; Another backward sunspot: Evidence continues to mount that the next solar cycle is beginning. When one solar cycle gives way to another, the magnetic poles of sunspots reverse polarity. For the second time in less than a month, such a "backward sunspot" has appeared--and this time it's a big one. The solar minimum is over, and the number of sunspots will rise until the next maximum around 2011.

"We are doing a Public night for 2 busloads of people from Greeley Natural History Museum for Forest Service again this year. It's at Crow Valley in Briggsdale on the 23rd of Sept. Meet us at the end of loop, look for us astronomers setting up. There

is plenty of room for all so come if you can, best dark sky public party we do. Forest Service in turn lets us use the place thru the winter months when nobody else is around. They usually close Crow Valley campground for winter, no campers anyway, only us die hards who brave the cold to get those dark sky views in. I like the place, flat and no cactus like Cactus flats north area we have been using. Pawnee grasslands are still LAS dark sky place but we can we use Crow Valley instead when campers are not there with their lights and fires."

"See you at the new moon star party at Crow Valley, do try to make it, even if just a few hours, you will be amazed how much better the views are than back yard views, I am spoiled and loving it, too bad we have to drive to get to the dark skies we used to enjoy from my yard years ago. see you in the dark as I say, bye," Gary Garzone

10 Years Ago – 2016

Our meeting this month is an open forum with following presentations:

Kevin O'Toole – "Astrophysics North Polar Alignment Scopes".

The approach with new polar scope is different as the reticle is fixed



Kevin O'Toole



Wayne Greene

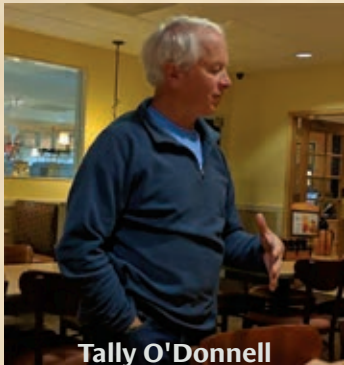
Wayne Green – "Photographing Perseid Meteor Shower with a GoPro Camera". The Hero4 music black camera is designed for photographing musicians in low light club settings. Because of its low light capabilities it works well for astronomy projects.

Mike Hotka – "The Astroleague Analemma Program".

Mike Hotka Mike loves the Astronomical League observing programs. He now has 48 and will soon complete 3 more. He began working on the analemma program by making a sun viewer. With the sun viewer you can calculate your latitude, tilt of earth axis, and dates of spring and fall equinox.



Mike Hotka



Tally O'Donnell

Tally O'Donnell – "Using Canon Camera lens and cooled CCD Camera for wide field photography".

With the Geoptic adapter you can use various T spacers to achieve the optimum distance to focus on the CCD camera's sensor.



Gary Garzone: - Fox Park Trip
Gary Garzone – Scope and sky - Beautiful thing about Fox Park is that it is so dark and clear you see stars down to tree line



Gary Garzone



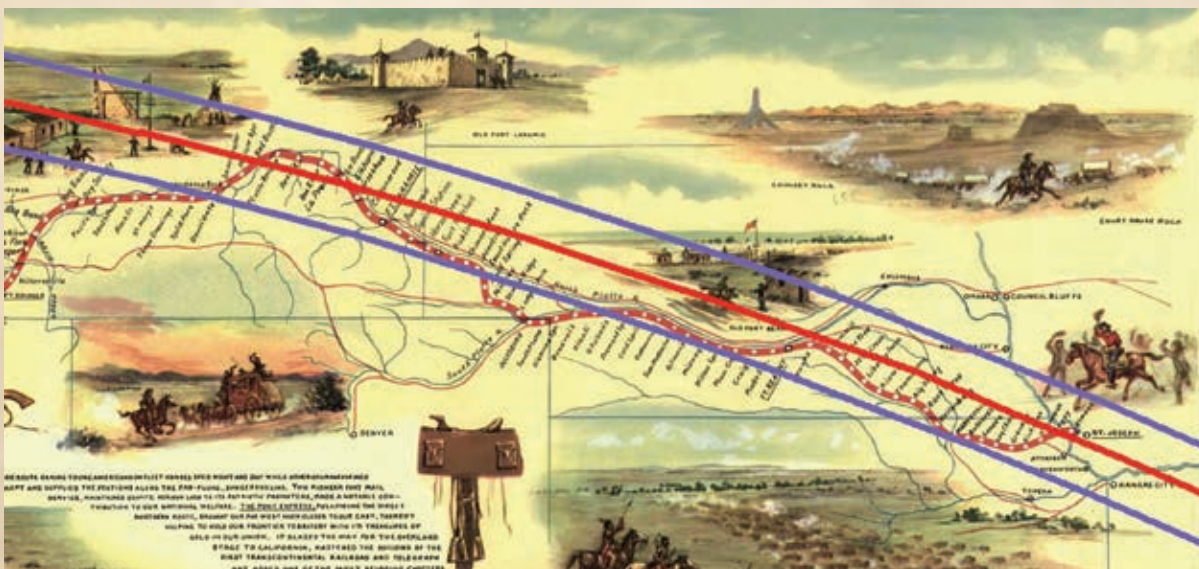
Tally O'Donnell



Jim Rollock

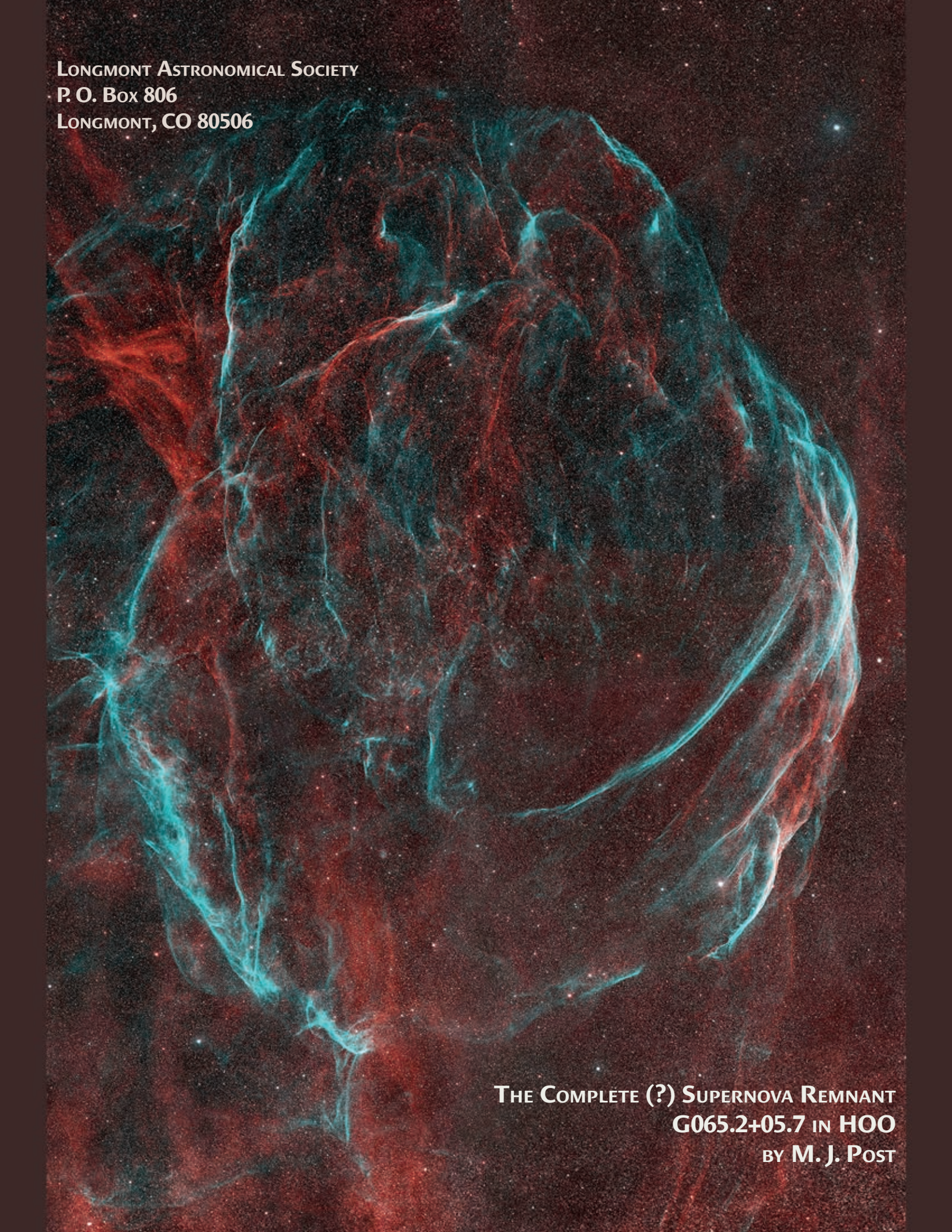


Bill Tschumy



Pony Express route overlaid with 2017 solar eclipse path by Vern Raben

LONGMONT ASTRONOMICAL SOCIETY
P. O. Box 806
LONGMONT, CO 80506



THE COMPLETE (?) SUPERNOVA REMNANT
G065.2+05.7 IN H α
BY M. J. POST