“Sun in H-Alpha on Mar 24”
by Brian Kimball
Our March 16th star party at Rabbit Mountain was a great success. Skies were clear and temperatures were tolerable. We had around 21 guests and 8 scopes set up so there were no long lines at any scopes. Everything was well run with Boulder Country handling traffic and parking. Thanks to everyone that came out and helped make it a great evening.

We are making good progress on the new website and should have it live shortly after this newsletter goes out. We will be switching our longmontastro.org domain to point to the new site so you won’t have to do anything different to get to it.

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As stated in this newsletter, the April meeting is going to be at the First Evangelical Lutheran Church on 3rd and Terry in downtown Longmont. We are still looking for a new permanent location but are making progress.

Notes from the President: Bill Tschumy

The meeting will be at the First Evangelical Lutheran Church on 3rd and Terry in downtown Longmont.

Dr. Amanda Hendrix of the Planetary Science Institute [PSI] in Boulder will be our featured speaker at the April 18 meeting. Here’s a brief bio from PSI’s website:

Dr. Hendrix has 20 years of experience in planetary science research. As a graduate student and post-doctoral research at LASP/Univ. Colorado, Hendrix gained valuable experience in UV spectroscopy and instrumentation and began a career of investigating solar system surfaces (largely airless bodies) in the UV. After LASP, she spent 12 years at JPL, progressing from a science planner on Cassini to Deputy Project Scientist, before moving to PSI in 2012. She is a co-investigator on the Cassini UVIS instrument and a Participating Scientist on the LRO LAMP instrument. She has participated in numerous mission studies, including the Europa Orbiter of the Jupiter Joint Science Definition Team (2008-2009) (serving as its Deputy Study Scientist) and the Jovian System Orbiter Science Definition Team (2007). She has led programs and published results in the JSDAP, PG&G, OPR, LASER and CDAP programs, among others. Besides research, she enjoys teaching and sharing her love of planetary science with students and the public.

To say Dr. Hendrix knows a bit about the solar system would be rather an understatement! While we have not yet confirmed her specific topic, here are a few projects she has worked on recently that could be her topic. Her interest in Titan as a possible place of human habitation is chronicled in Beyond Earth, co-authored with Charles Wohlfith. Her continuing fascination with moons of large solar system planets lead her to contribute significantly to Enceladus and the Icy Moons of Saturn, published just last December. In October she was one of three panelists discussing women in STEM. And in April she will be spending a week as a Global Scholar in Residence at Holy Innocents’ Episcopal School in Atlanta. We’re looking forward to her presentation on the 18th.

Presentation by Amanda Hendrix

LAS Meeting - April 18 at 7pm

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The Longmont Astronomical Society Newsletter ISSN 2641-8886 (web) - ISSN 2641-8908 (print) is published monthly by the Longmont Astronomical Society, P. O. Box 806, Longmont, Colorado. Newsletter Editor is Vern Raben. Website https://www.longmontastro.org.

The Longmont Astronomical Society is a 501 c(3), non-profit corporation which was established in 1987. Our main goal is to promote local amateur astronomy. This is accomplished through regular monthly meetings, star parties and public observing sessions.

Regular meetings are held every month (except December) on the third Thursday. The current location is at the IHop Restaurant, 2040 Ken Pratt Boulevard in Longmont. Meetings are open to the public and begin at 7:00 PM. A group of us have dinner at the IHop before the meeting around 6 pm.

A broad spectrum of topics are covered at the meetings and include such things as deep sky observing, planetary imaging, narrow band imaging, equipment discussions and demonstrations just to name a few. These subjects are presented by both club members as well as special guests who are professional astronomers or experts in a particular field.

Mercury
Mercury is not visible this month.

Venus
Venus is low on April 1st at magnitude -4 in constellation Aquarius. Its disk is 13 arc sec across. It moves to constellation Pisces on the 16th and then to Cetus on the 25th.

Mars
Mars is in the constellation Taurus. It decreases in brightness from +1.5 on the first to +1.6 by month end. Its apparent disk shrinks form 4.4 arc to 4.2 arc sec across.

Jupiter
Jupiter is constellation Ophiuchus all month. It is increases in brightness from magnitude -2.3 on the 1st to -2.5 on the 30th. Its increases in size from 40 to 43 arc sec across.

The Great Red Spot should cross the center of Jupiter’s disk at the following times this month assuming a longitude of 307° (see http://jupos.privat.t-online.de/rGrs.htm).

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<td>3:24 am</td>
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</tr>
<tr>
<td>April 27</td>
<td>5:02 am</td>
<td>27°</td>
</tr>
</tbody>
</table>

Saturn
Saturn is in constellation Sagittarius all month. It is magnitude +0.6 in brightness and its disk is 17 arc sec across.

Uranus
Uranus is visible early in the evening in constellation Aries until about the 10th when it disappears into bright twilight. It is magnitude +5.9 in brightness and its disk is 3.4 arc sec across.

Neptune
Neptune is visible low in the morning sky after April 2 in constellation Aquarius. It is magnitude 7.9 in brightness and its disk is 2.2 arc sec across.

Meteor Showers
The Lyrids meteor shower peaks early in the evening of April 22. Best time to view would be just before moon rise at 11:26 pm. From a dark location you might see about 20 meteors per hour. The Lyrids meteor shower has been observed for perhaps 2500 years. It is caused by debris from comet C/2018 G1 (Thatcher).
Comet 46P Wirtanen is magnitude 11.8 in brightness and is in the constellation Leo Minor on April 1. It moves into Leo on April 27. By the 30th it dims to magnitude 13.5.

Comet 2018 Y1 (Iwamoto). On April 1 it is in the constellation Perseus and is 9.9 magnitude in brightness. It is expected to fade to magnitude 10.9 by April 20th; after the 20th it will be too difficult to observe.
**Lunar Highlights - April 13 at 9 pm**

**Plato**
Plato is a nearly 63 mile wide impact crater filled with 1.2 miles of lava forming a seemingly smooth floor. Use a high power eyepiece to observe the shadows on the crater floor cast by the peaks on the eastern rim.

**Alpine Valley**
To the east of Plato is the 6 mile wide and 120 mile long Alpine Valley formed from two parallel fault lines. If seeing is good try to locate the rille running along the center of the valley.

**Copernicus**
Copernicus is 58 miles across and has walls that rise 12,400 above the floor of the crater. On the evening of April 13 at 9 pm it is just after sunrise in Copernicus. The light from the morning sun is starting to touch the western walls and peaks.

**Straight Wall**
The Straight Wall or Rupes Recta is visible even with small telescopes. It is a 68 mile long escarpment formed as an effect of faulting. The area to the west of the fault (left) is 800 to 1000 feet lower than the area to the east. West of the straight wall is a 10 mile wide crater called Birt. An observing challenge for you is to spot Rima Birt which is a thin rille west of Birt and towards the north.

**Longomontanus**
Longomontanus is 90 mile wide ancient impact crater. Its impact destroyed much of the older and smaller crater to the east.
April 13th at 9:00 pm (8 days and 18 hours after new)
Navigating the April Night Sky, Northern Hemisphere

For observers in the middle northern latitudes, this chart is suitable for mid April at 10:00 p.m. Daylight Time.

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.

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

1. Extend an imaginary line north from the two stars at the tip of the Big Dipper’s bowl. It passes Polaris, the North Star.
2. Draw another imaginary line west across the top two stars of the Dipper’s bowl. It strikes Capella low in the northwest.
3. Through the two diagonal stars of the Dipper’s bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
4. Look in the west-southwest for the bright Winter Triangle stars of Sirius, Procyon, and Betelgeuse.
5. Directly below the Dipper’s bowl reclines the constellation Leo with its primary star, Regulus.
6. Follow the arc of the Dipper’s handle. It first intersects Arcturus, then continues to Spica.
7. Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.

Binocular Highlights

A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.
B: Look nearly overhead for the loose star cluster of Coma Berenices.
C: In the Big Dipper’s handle shines Mizar next to a dimmer star, Alcor.

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.
If you can observe only one celestial event this month, view this one:

The Scene: Crescent moon and Mars slide between the Hyades and Pleiades

In the early evening just as darkness settles on April 8 and 9, look low in the west-northwest for a fascinating celestial interplay.

- Mars, far dimmer than it was last August, still shines noticeably in the west. Throughout April it slides between the Pleiades and Hyades star clusters.
- On April 8, the crescent moon joins Mars by moving between the two clusters. On April 9, it is just above Aldebaran.

From Our Newsletter Archives

April 2009
A newsletter was not published for April 2009.

April 1999
LAS is supporting a star party at North Sterling Reservoir State Park on April 17. Colorado State Parks, North Sterling Reservoir State Park, and Northeastern Junior College are collaborating to create and build an observatory and astronomy center at Sunset Cove.

Images from Mars Surveyor show that volcanoes were probably active on Mars within the last 100 million years. Planetary scientist can estimate the age of features on a planet surface by counting craters left by meteorite and asteroid impacts.

April 1989
Notes from President Jim Getson:
We had a star party in Hudson at the first of the month which started out mostly cloudy but cleared as the evening progressed.

Star party on the 8th was clouded out. We have another scheduled for the 28th.

John Pool will give a presentation about his astrophotography at this month's meeting at Longmont High School.

Mystery Herschel object this month was blue planetary NGC 6210 in Hercules.
Star Hopping by Michelle Blom and Sven Schmidt

Why Star Hop?
Star hopping is a means to find a specific object you want to study. With the advent of GoTo mounts and DSCs (Digital Setting Circles), star hopping is less practiced as the first two methods are more convenient and faster. On the other hand, while star hopping, countless times we see beautiful double stars, deep-orange stars and mini asterisms that we would otherwise have missed. Astronomy software like SkySafari (See https://skysafariastronomy.com) (which we use on a tablet or phone) makes star hopping a joy.

Telrad

You may find that the Telrad reticle makes it hard to align the Telrad on fainter stars. A Telrad pulsing kit can help with this. You can chose the pulse rate, thus making it easier to align on faint stars when the reticle is not visible.

Using a Telrad is a great way to quickly point the scope near the object you want to study.

The red reticle is projected onto a screen that is overlaid on the sky background as you look through it. This allows for easy targeting since there is no magnification involved. Also, notice that the center of the reticle does not obstruct bright objects like stars, compared to a red dot finder.
You align the Telrad with your telescope’s OTA (Optical Tube Assembly). Looking straight through it, you should see a red reticle consisting of three circles.

The diameter of those circles is 0.5° (inner circle), 2° (center circle) and 4° (outer circle).

To display the Telrad reticle in SkySafari, follow these steps:
1) Click on “Observe” (in some versions this may be under “Configure”)
2) Select “Scope Display” from the pop up menu
3) Then select “Telrad Circles” The Telrad circles will then be overlayed in the center of view.

SkySafari General Setup
When using SkySafari at the eyepiece, it can be helpful to rotate the tablet/phone to match the eyepiece view. For this, it helps to disable auto-rotation in SkySafari, i.e. disable the changing from portrait to landscape mode and vice versa.

First select “Settings” on the bottom menu bar and then “Appearance & Behavior”.

Then deselect “Auto Rotation”.

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SkySafari Telescope Setup
Before using SkySafari for star hopping, we need to enter the equipment information for SkySafari to render the sky through the eyepiece correctly. We start with entering the telescope type:
1) Select “Observe” (or in some versions “Settings”)
2) Select “Equipment”
3) Then click on “Add Telescope”
4) Add your scope information

SkySafari Eyepiece Setup
Same for the eyepieces you are planning on using:

Enter your eyepiece information.

SkySafari FOV (field of view) Setup
We now need to pair up the telescope together with the eyepieces. Select “Scope Display”

Once you created an FOV indicator, SkySafari will display important information on the scope display page:
• FOV: Field of view in degrees
• Mag: Magnification of the image
• EP: Exit Pupil

The FOV is particularly important as it allows you to estimate the size of extended objects like planetary nebulae, galaxies, and planets.

Angular Extent
1 degree = 60 arcmin = 60’
1 arcmin = 60 arcsec = 60”
Star Hopping and FOV Indicators

Assume we'd like to star hop to the planetary nebula NGC 5 246, the Skull Nebula, in Cetus. Start with your lowest power eyepiece to see the most sky (largest FOV).

We start with a bright star, say Deneb Kaitos, and align the scope using the Telrad. In the SkySafari App we then tap on the upper right-hand corner to select a FOV indicator (Rings).

Matching Up the Eyepiece View

We now match up the stars we see in the eyepiece with what is shown in SkySafari. Tap on the upper left-hand corner, tap + or - to increase/decrease the limiting star magnitude until both views match.

Recognizing and Matching Up Patterns

From now on, you try to move into the general direction of NGC 246 by finding star patterns and matching them up with SkySafari. It helps to rotate the tablet/phone while doing so, which makes it even easier. Since we disabled auto-rotation earlier, SkySafari will not switch between landscape and portrait mode while doing this.

Missing Feature

It would help tremendously if SkySafari would display an arrow pointing in the direction of the target object. You are rarely moving directly towards it, so you keep having to zoom out and in repeatedly.

Tablets and mobile phones emit a lot of light in the blue spectrum, even if set to night mode. A good red cling can help to preserve your night vision. We use XTRA Dark Red Eyes, from Sirius Astro Products. They run about $14. See https://www.siriusastro-products.com/
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<tr>
<th>Page</th>
<th>Image</th>
<th>Author</th>
<th>Scope</th>
<th>Camera</th>
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<td>Front</td>
<td><img src="image1.png" alt="Image" /></td>
<td>Brian Kimball</td>
<td>Lunt LS100 ha scope</td>
<td>Imaging Source DMK41</td>
<td>Sun in H-Alpha Lunt LS100 ha scope with a B3400 blocking filter (Mar 24)</td>
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<td>Stephen Garretson</td>
<td>TPO 8” Ritchey-Chretien</td>
<td>ZWO ASI1600</td>
<td>NGC 896, “Fish Head Nebula” Baader 3.5nm Ha filter (Mar 17)</td>
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<td>Stephen Garretson</td>
<td>TPO 8” Ritchey-Chretien</td>
<td>FLI Microline 16200</td>
<td>Melotte 15 in HOO 600 sec Baader 3.5nm Ha filter, 600 sec Baader 8.5nm OII filter (Mar 8)</td>
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<td>Eddie Hunnell</td>
<td>Celestron 11” RASA</td>
<td>ZWO ASI128MC Pro</td>
<td>Rossette LPS filter (Mar 24)</td>
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<td>Eddie Hunnell</td>
<td>Celestron 11” RASA</td>
<td>ZWO ASI128MC Pro</td>
<td>M33 LPS Filter (Mar 27)</td>
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<td><img src="image6.png" alt="Image" /></td>
<td>Chris Fauble</td>
<td>William Optics ZenithStar 61 + Flat61A</td>
<td>ZWO ASI 1600MM Pro</td>
<td>NGC 2264 Baader 1.25”H-alpha (7nm) (Mar 8)</td>
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<td><img src="image7.png" alt="Image" /></td>
<td>Glenn Frank</td>
<td>Celestron C9.25 at f6.3</td>
<td>ZWO ASI 1600MM</td>
<td>Moon on Mar 16 Single exposure at 2.5 ms (Mar 17)</td>
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<td><img src="image8.png" alt="Image" /></td>
<td>M. J. Post</td>
<td>C8 Edge telescope with Hyperstar</td>
<td>QHY 183 mono camera</td>
<td>M51 30 min of luminance data and 12 min each of R,G, &amp; B(Mar 30)</td>
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<td><img src="image9.png" alt="Image" /></td>
<td>David Elmore</td>
<td>Borg FS55 astrograph</td>
<td>Canon 6D</td>
<td>Orion Pearls (thin clouds) Borg 200mm focal length F/3.6, 26 4 min exposures with Triad filter (Mar 8)</td>
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<td><img src="image10.png" alt="Image" /></td>
<td>Jim Pollock</td>
<td>CPC-1100 and Hyperstar</td>
<td>Canon 6D</td>
<td>Makarian’s Chain (Mar 16)</td>
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<td>Gary Garzone</td>
<td>Celestron 14 in Edge HD</td>
<td>SBIG STL 11000</td>
<td>Sombrero Galaxy (Mar 12)</td>
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<td>NGC 4565 (Mar 26)</td>
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<td>Tally O’Donnell</td>
<td>ES102CF</td>
<td>ZWO ASI094MC</td>
<td>SH 236 and 239 OSC, NB filters, 40 minutes of 10 minute subs (Mar 24)</td>
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<td>Tally O’Donnell</td>
<td>ES102CF</td>
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<td>M42 in HOO 20 minutes of Ha and 10 minutes of OII (Mar 13)</td>
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<td>Brian Kimball</td>
<td>5” APO refractor scope</td>
<td>Imaging Source DMK41</td>
<td>Sun in Calcium K Lunt B1800 calcium K module (Mar 31)</td>
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“Sombrero Galaxy (M104)” by Gary Garzone

“M51 “by Gary Garzone
Announcements

• Introductions - LAS Officers
  • President: Bill Tschumy
  • Vice President: Stefan Garretson
  • Treasurer: Marty Butley
  • Secretary: Joe Hudson
  • Board members:
    • Vern Raben
    • David Elmore
    • Tally O’Donnel
    • Brian Kimball
    • Gary Garzone

Meeting Minutes
March 21, 2019 at 1900 hours MDT
IHop Restaurant, 2040 Ken Pratt Boulevard, Longmont, Colorado

Bill Tschumy, President, opens and moderates:

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• Board members:
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  • David Elmore
  • Tally O’Donnel
  • Brian Kimball
  • Gary Garzone

Announcements
• April 13 Rabbit Mountain LAS Night Out
• Astronomy on Tap April 9, 6:30 at Gunbarrel Brewery (Use EventBright for tickets: https://www.eventbrite.com/e/astronomy-on-tap-at-gunbarrel-brewing-company-tickets-56080416034?aff=ebdssbdest-search

Presentation: Astrophotography Excursion to San Pedro de Atacama Celestial Explorations

David Elmore
Stephen Garretson
M. J. Post
Tally O’Donnel

David introduces:
The four traveled to the Atacama Desert in Chile last October for an astrophotography vacation, outside San Pedro and very near the famed ‘Atacama Large Millimeter Submillimeter Array’ (https://www.almaobservatory.org/en/home/).

This is the second most visited region in Chili because of lithium mining. Chile possesses most of the world’s reserves. There are more than 50 astro-tourism companies in San Pedro alone, all taking advantage of the high dry air.

The group also took a tour of the Alma HQ and Low site at 8k feet above sea level. Visitors do not ascend to the high site (which is at 16,000 feet above sea level). David mentioned that their guide at the Array possessed such expertise and topical knowledge that they might have been a retired professor or similar... but no, simply a very knowledgeable and skilled employee!

First observing night it was quite wild to see Orion upside down... Scorpio and the central bulge of the Milky Way was 68 degrees higher in the sky than we see here. David mentioned could see the barred spiral nature of the LMC (and Tally could not!), and then each spoke to many of the images they took. Of the 5 nights stayed, weather was a little iffy the first night but after that crystal clear.

When queried about the budget for such a trip, they estimate airfare $1500, lodge room (with kitchen) and groceries $700, equipment rental or sightseeing extra, so maybe $2,500 each. For what seems like a rather modest expense, they all had a superb time and would strongly recommend a similar trip.

Presentation: Star Hopping by Michelle Blom and Sven Schmidt

Summary: While some may think it tedious, we have found star hopping to both valuable and enjoyable simply because of all the objects you see “as you travel”

Equipment -
Less is More - a Telrad, Sky Safari, and a quality, legal green laser. Telrads offer no magnification and as such are used for scope placement on naked eye objects that begin the ‘hop.’ Their Telrad has centering circles @ 1/2, 2, and 4 degrees, and Sven also described a ‘pulsing kit’ that dims and restores the intensity of the projected circles rhythmically, as an additional aid to locating dimmer objects. They prefer circles to a red dot which can sometimes obstruct a target being sought.

Sky Safari is configured for the Telrad and their observing equipment. One particular tailored appropriately for FOV indicators mag of image and exit pupil for observing. Sven is also a strong advocate of red film vs. software ‘night mode’ - films remove blue light from a PC screen that software cannot. Get Sirius Astro Products for Red Eye “Cling” film ‘XTRA Dark Red Eyes’.

Laser Pointer to assist with location or outreach. Don’t buy a cheap one: ~ 5Mw green is adequate, but it must have a good IR filter. The human eye is not sensitive to intense IR light but can be damaged by it. Cheap
lasers do not have filters or they’re of questionable effectiveness. Never let children play with any laser. They’ve found quality lasers at a Canadian concern called LaserGlow, their model is a Lyra (@ $59) but other models exist. See https://www.laserglow.com/product/byproduct/Premium-Laser-Pointers/

Business Meeting
Finance Report by Marty Butley - report accepted as presented.

Bill Tschumy: Wild Apricot has been decided upon as the replacement website platform. If curious LAS members can access LAS.WILDAPRICOT.ORG (still in beta). Wild Apricot contains a modern payment engine to support membership collection as well as other sales or ticketing of special LAS events. It also offers content migration assistance and we’ll have ‘Members Only’ directories for profiles, images, etc. Should have rollover completed in the next month.

Dues discussion: Some discussion but will vote next month on $26 per 12 months and allowing memberships to start when paid rather than always beginning in January.

Bylaws - cleanup including remove prorated dues, removed a duplicate, renumbered section, and added non discrimination and anti-harassment language. Vote will be next month as well.

Meeting Location
April meeting will be at First Evangelical Lutheran at 3rd and Terry, in downtown Longmont. There is limited parking in front; the parking more in back is closer. Meeting closed.

Astronomy Headlines

This Hubble Space Telescope image reveals the gradual self-destruction of an asteroid, whose ejected dusty material has formed two long, thin, comet-like tails. The longer tail stretches more than 500,000 miles (800,000 kilometers) and is roughly 3,000 miles (4,800 kilometers) wide. The shorter tail is about a quarter as long. The streamers will eventually disperse into space.

Credits: NASA, ESA, K. Meech and J. Kleyna (University of Hawaii), and O. Hainaut (European Southern Observatory)
During super-close flybys of Saturn’s rings, NASA’s Cassini spacecraft inspected the mini-moons Pan and Daphnis in the A ring; Atlas at the edge of the A ring; Pandora at the edge of the F ring; and Epimetheus, which is bathed in material that fans out from the moon Enceladus. The mini-moons’ diameter ranges from 5 miles (8 kilometers) for Daphnis to 72 miles (116 kilometers) for Epimetheus.
F Ring
E Ring
Atlas
Epimetheus
Pandora
Daphne
Pan
“Sun in Calcium K” by Brian Kimball