

<p><b>Program – After meeting star party</b></p>	<p><b>Volume 28, No.2 July 2022</b></p>
<p><b>Greg Smith – editor.</b></p>	<p><b>Meeting: Wednesday 8pm July 20, 2022</b></p>

**JWST- did you expect more?**

I am sure you have seen the new Webb pictures. Their detail is amazing. The southern Ring Nebula picture is so detailed. As was the Ultra Deep Field picture and all the new galaxies that could be seen. The ‘Cosmic Cliffs’ in Carina is incredible.

But to be honest, I think the Hubble picture of the southern Ring Nebula is prettier. The pale blue center of the nebula in the Hubble picture is more pleasing to my eye. The detail in the Webb picture is fabulous for the scientists, its detail of the ‘backside’ of the Ring nebula is what is getting them excited.

It is being told that we will be seeing these kinds of detailed images for the next twenty years. I will get used to seeing these kinds of detailed photos and enjoy them as much as the visual light photos I have been used to. Webb may yet surprise us with some very pretty pictures too.

We will be treated soon to graphs of Earth sized planets and their atmospheric data. Kind of like the data graph of the “Hot Jupiter” showing that there is water vapor in its atmosphere.

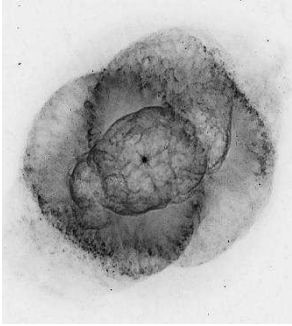
This past week has been the start of a new era in Astronomy. The largest Space telescope has gone beyond the planning and expected outcome with its clarity and sharpness of its photos.

We can breathe a sigh of relief for the success of JWST.

It looks like a warm clear Wednesday for the Club meeting at Mike Feist’s home.

We should have nice clear sky for the star party that follows the meeting. So bring your scope and viewing plans, a light jacket maybe advisable as a light breeze is forecast too.

*Every Day is a Star Filled Day,  
Every Night is a Starry Night*



# James Webb 1<sup>st</sup> Year



## What the James Webb Space Telescope's First Year will Reveal

BY: [MONICA YOUNG](#) JULY 11, 2022

On Monday and Tuesday, July 11th and 12th, the James Webb Space Telescope team released the observatory's long-awaited first images. From a Jupiter-size planet just 1,150 light-years away to galaxies residing in the early universe, the images represent the tip of the iceberg — we have so much more to look forward to.

In its first year, Webb will take 6,000 hours of observations, amounting to 250 days' worth of nonstop cosmic revelation. More than half of this time will go to small programs, each of which will receive at most 25 hours. By the end of the first year, we'll have thousands of targets — ranging from comets to planets to distant galaxies — with unprecedented infrared imagery and spectroscopy.

Here's what the first year of observations could tell us, as told from the perspective of a selection of science programs in the queue.

Seventy of the accepted proposals focus on exoplanets, many of these on individual targets ranging from hot Jupiters to “super-puffs” (gas giants that are bigger than they ought to be) to hot rocky worlds.

The lava world 55 Cancri e is one of the latter. The planet has the mass of 8 Earths and orbits searingly near a Sun-like star, 100 times closer in than Earth is to the Sun. Although it was discovered in 2004, there's a lot we still don't know about this alien world. Is it bare rock or is it enveloped by a swirling atmosphere? And if it's bare, could it still host vaporized minerals released from its magma surface? Is it tidally locked, showing only one face to its sun, or does its rotation overlap its orbit in a 3:2 resonance as Mercury's does?

These are the questions that Alexis Brandeker (Stockholm University, Sweden) and colleagues seek to answer with just over a dozen hours of Webb observations, which he expects in November.

A bare, rocky world would have a silicate crust, as Earth does, but 55 Cancri e is so blazing hot that these silicates would vaporize from its molten surface in the day and fall back to the surface at night as lava rain. Webb will take a spectrum of the thin sliver of vapor that surrounds the planet, which becomes visible as the planet passes in front of its star. Multiple spectra could detect the silicon oxide gas on the dayside and the silicon dioxide crystals that fall in the evening.

If, on the other hand, the planet does have an atmosphere, Webb will see a spectral signature that will help investigate that gaseous envelope instead. Characterization of surfaces and atmospheres will be Webb's key contribution in its first year, Brandeker says.

"I'm excited to see beautiful spectra of a whole array of exoplanets with JWST!" agrees Caroline Morley (University of Texas, Austin), who was involved in a proposal to observe another hot rocky exoplanet, LHS 3844b. "We'll learn detailed new things about larger planets (Jupiter and Neptune-sized), including their atmospheric compositions and climates. For smaller, rocky planets like LHS 3844b, I'm particularly excited to see what the composition of the surface looks like."

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Unlike 55 Cancri e, LHS 3844b is almost certainly bare rock. Morley, team lead Laura Kreidberg (Max Planck Institute for Astronomy, Germany), and colleagues will explore it using a technique called emission spectroscopy. That means the light that Webb will capture comes from the planet itself — something that becomes more feasible at infrared wavelengths, in which stars shine less brightly.

“With JWST, we’ll actually be able to tell the difference between a solidified magma ocean (ultramafic), volcanic resurfacing (basalt — think Hawai‘i!), or a more granite-rich surface,” Morley says. “This is one of the best targets for these kinds of observations.”

## REACHING OUT TO DISTANT GALAXIES

You’ve heard of the Hubble Deep Field, a long look into the black space between stars that revealed hundreds of thousands of galaxies. Webb is set to extend the view.

The proposal to conduct the next-generation Deep Extragalactic Exploratory Public (DEEP) survey, led by Steven Finkelstein (University of Texas, Austin), asks for over 120 hours to home in on the same area of sky covered by Hubble’s deep and ultra-deep fields. As Webb looks back through space and time, the image will ultimately span most of cosmic time, from 400 million years after the Big Bang to almost 6 billion years later. In certain regions, Webb might reveal galaxies from an even younger universe.

“We have seen galaxies 97% of the way back to the Big Bang,” says Dan Coe (Space Telescope Science Institute). “I am most excited to finally see objects that existed during that missing first 3%, the first 400 million years of the universe.”

What’s more, Webb will be seeing not just the large galaxies but the dwarf ones with less heft than the Magellanic Clouds, far smaller than what Hubble could capture. This sensitivity enables astronomers to explore galaxy evolution in all its stages. The data will also contain spectroscopy, a powerful tool to pin down how many and what types of stars are forming through cosmic time.

“Being public immediately, NGDEEP follows in the footsteps of the Hubble deep field programs, enabling the community to explore the power of Webb when pushed to its limits,” write Finkelstein and colleagues.

Other proposals zero in on some of the most distant galaxies known. Detected by Hubble, these galaxies will yield additional details to Webb’s instruments. Coe, for example, is leading observations targeting the galactic infant dubbed MACS 0647-JD. A gravitational cluster that lies in the foreground acts like a giant cosmic lens to magnify its light, aiding human-made

telescopes. But Hubble, even with the help of this cosmic lens, couldn't resolve the galaxy, which mean it's really tiny — less than 300 light-years across. The Milky Way, by comparison, is 100,000 light-years and even its satellites, the Magellanic Clouds, span on the order of a few thousand light-years. This proto-galaxy is thus about the size of a single star-forming cloud in a modern-day galaxy.

Coe and colleagues expect Webb to actually resolve this tiny proto-galaxy, making out the structures within it and shedding light on the early era of star and galaxy formation. “Is this a building block of galaxies yet to come? We doubt it! We've seen much smaller structures in galaxies down to star clusters one parsec across,” Coe says. “This is what we want to see: Are the first galaxies made of multiple small clumps?”

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## **2022 Friends of Galileo Astronomy Viewing Schedule**

### **July**      **Moon: New=28, Full=13**

20            Club Meeting (Zoom and live) at Mike's  
26-31        Oregon Star Party at Ochoco National Forest  
29/30        Club Star Party at Mike's

### **August**      **Moon: New=27, Full=11**

4/5           Sidewalk Astronomy (Location TBD)  
11/12        Perseids/Club Star Party at Mike's (Moon is Full)  
17            Club Meeting (Zoom?)  
26-28        MSHI Sky & Star Party at Coldwater Science and Learning  
                  Center

### **September**      **Moon: New=25, Full=10**

1/2           Sidewalk Astronomy (Location TBD)  
21            Club Meeting (In-Person/Zoom)  
23/24        Club Star Party at Mike's  
30            Club Star Party at Mike's

### **October**      **Moon: New=25, Full= 9**

1            Club Star Party at Mike's (if not held September 30)  
19            Club Meeting (In-Person/Zoom)  
21/22        Club Star Party @ Mike's

☞ **July 2022 Meeting** ☞

DATE: July 20, 2022

TIME: 8:00pm

PLACE: Hybrid in person / Zoom - originating from Mike Fiest's home

PROGRAM : after meeting star party

**Moon Phases**

**3<sup>rd</sup> Qtr.:** Wed. July 20, **New:** Thu. July 28, **1<sup>st</sup> Qtr.:** Fri. Aug. 5, **Full:** Thur. Aug. 11,

**End of twilight** - when the stars start to come out.

**Wed July 20<sup>th</sup>** 9:31:53 pm

**Sun. July 31<sup>st</sup>** 9:26p.m.

**Tue. Aug 16<sup>th</sup>,** 8 :51p.m.

**The Star Report** is posted on the clubs website: It is listed in the blog portion of the website.

**Minutes of the June FOG Meeting**

Here's the agenda from the June meeting, along with the relevant discussion about each:

## Friends of Galileo Club Officers

PRESIDENT	Ted Gruber
VICE-PRESIDENT/ PROGRAM CHAIR	Mark Thorson
SECRETARY	Greg Smith
TREASURER	Steve Powell
WEBSITE	Ted Gruber
NEWSLETTER ED.	Greg Smith
ALCOR	Tom Meek

## Next Month's Newsletter Deadline

The deadline for items in next month's newsletter is:  
**Wednesday: seven days before next meeting.**

**Please feel free to send in your thoughts and experiences about your astronomical adventures.**

Submit your material by E-mail to: [gryth@msn.com](mailto:gryth@msn.com)

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 Longview, WA

