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THE OBSERVER

BATTLE POINT ASTRONOMICAL ASSOCIATION

WWW.BPASTRO.ORG BAINBRIDGE ISLAND, WA

URGENT: VOLUNTEERS NEEDED!
James Webb Space Telescope event at KiDiMu 11/20/21

As was mentioned previously, the Bainbridge Island Kids Discovery Museum (KiDiMu) has been selected by NASA to be an official host of the Webb Telescope Community Events Initiative. Based on the BPAA's planning with KiDiMu, we need volunteers to support this event.

While the James Webb Space Telescope (JWST) launch has slipped to December 18th, based on guidance from NASA we are going ahead with a one-day event on November 20th (the Saturday before Thanksgiving).

We plan on having 3 telescopes inside for the kids to better understand what a telescope is, allowing them to look at objects around the upstairs of the museum. Weather permitting, we will have 2 or 3 more telescopes, including a solar scope, set up outdoors.

Along with the KiDiMu staff, we are putting together static displays, with both generalized space topics and JWST related items, positioned around the museum.

Additionally, again with weather permitting, we will have telescopes set up on the rooftop of Island Gateway, where we will engage the children with viewing Jupiter and Saturn in the evening.

The indoor activities will go from 9am to 4pm, with the rooftop viewing taking over at 4pm and going until 8pm.

We would like to have 2 volunteers for each telescope and individuals to be by the static displays to answer questions. Additionally, KiDiMu has resources (training and videos) available for some of the other hands-on JWST activities for the kids that people can also volunteer to support.

IMPORTANT NOTE: Since KiDiMu is an educational institution, ALL volunteers MUST BE VACCINATED, and PROVIDE PROOF.

Please come out to support KiDiMu and the BPAA to make this a successful event! Contact any Board Member to volunteer. Let them know your desired volunteer position and any constraints you might have.

Thanks in advance for your support!

Update on Soccer Lights

The newly-formed "Year-Round Fields Coalition" (YRFC, formerly the affiliation of youth soccer, girls lacrosse, and ultimate frisbee supporters led by the Bainbridge Island Football Club (BIFC) advocating for stadium lights in Battle Point Park), will soon ask the Parks District to begin the permitting process with the City of Bainbridge Island, even though there has been no public process and no Commission vote on whether to approve the lights. The YRFC had asked for time at the 11/18 Commission meeting to make a presentation on why permitting should proceed now, but the Park District denied their request. According to sources, the District is exploring alternate locations on the Island for lighted artificial turf fields, and until that effort is exhausted the proposal for lights in Battle Point Park will not be taken up.

In the meantime, if you oppose lights in Battle Point Park you should make your objections known to the Commissioners by emailing them; their addresses are here: https://biparks.org/board/. When writing, please be clear, objective, persuasive, and calm. Feedback we've received from Commissioners indicates that hearing from folks like us is critical in the Board's decision-making process, so WRITE YOUR LETTERS!

Please also visit BattlePointAlliance.com, the website of the neighborhood group opposing the lights, and sign their petition: https://chng.it/85YJvF66jH.

Board Elections Upcoming:

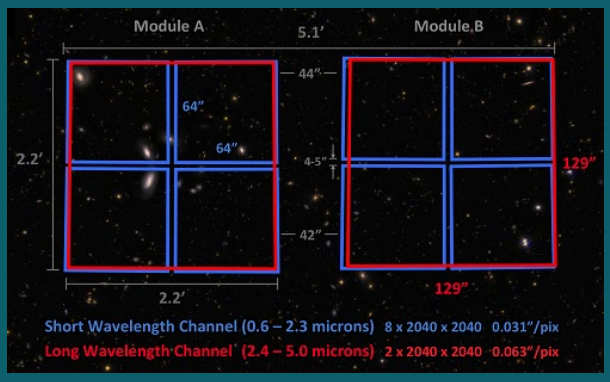
Every year at our annual meeting BPAA elects its board members. If you would like to become more involved in the governance and operation of our association, please consider nominating yourself for a board position. We will be announcing the slate of nominees in December, and the election will occur at our annual meeting on Wednesday January 12, 2022. Contact board president Frank Petrie, or any current board member, to learn more about what we do.

Remember, you don't need to know a lot about astronomy or telescopes to help plan for and manage the observatory and its many activities. In fact, serving on the board is a great way to quickly learn a whole lot of cool stuff about astronomy!

James Webb Space Telescope Science Instruments

Source: Science Instruments (stsci.edu))

Near-Infrared Camera



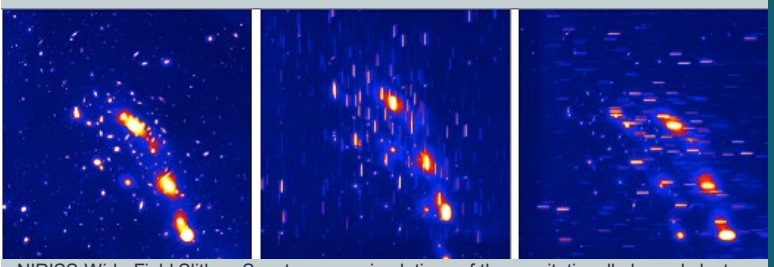
NIRCam imaging covers the two adjacent fields of total area 9.7 arcmin². Long and short wavelengths are observed simultaneously. Because of the changing size of the PSF, the short wavelengths use four detectors in each module while the long wavelengths are covered by one detector.

The Near-Infrared Camera (NIRCam) is JWST's primary imager in the wavelength range from 0.6 to 5 µm. It consists of two, nearly identical, fully redundant modules, which point to adjacent fields of view on the sky and can be used simultaneously. Each module uses a dichroic to also observe simultaneously in both the short wavelength channel (0.6–2.3 µm) and long wavelength channel (2.4–5.0 µm).

In addition to imaging with a wide range of narrow, medium, and broad filters, NIRCam also offers wide field slitless (grism) spectroscopy and coronagraphic imaging modes, as well as time-series and grism time-series observing modes for high accuracy photometric monitoring and spectrophotometric monitoring, respectively. NIRCam also obtains wavefront sensing measurements critical for periodic alignment and phasing of the segments of JWST's primary mirror.

NIRCam was built by a team at the University of Arizona and Lockheed Martin's Advanced Technology Center, led by Principal Investigator Marcia Rieke from the University of Arizona.

Near-Infrared Imager and Slitless Spectrograph

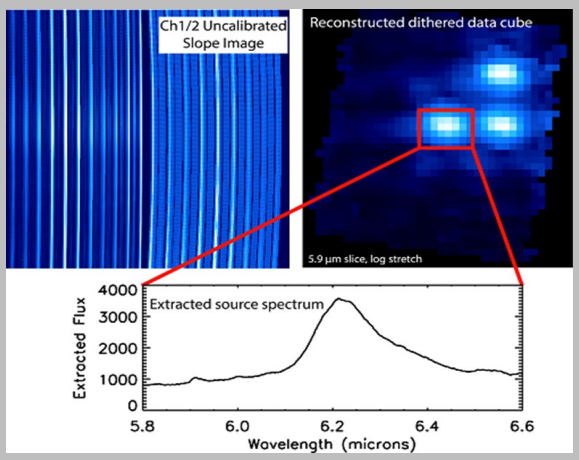


NIRISS Wide-Field Slitless Spectroscopy simulations of the gravitationally lensed cluster MACS J0416.1-2403. Left: Image through the F200W filter. Middle and right: Slitless spectra through the F200W filter with the GR150R grism and the GR150C grism. Observations with orthogonal dispersion directions can be used to disentangle blended spectra in crowded fields.

The JWST Near-Infrared Imager and Slitless Spectrograph (NIRISS) provides unique observational capabilities between 0.6 and 5 µm that complement those available with NIRCam and NIRSpec. Its efficient, all-reflective design enables low-resolution, wide-field grism spectroscopy; medium-resolution grism spectroscopy optimized for applications requiring extreme spectrophotometric stability; aperture masking interferometry; and parallel imaging through filters matched to those available with NIRCam.

NIRISS is a contribution of the Canadian Space Agency to the JWST project. Honeywell International designed and built the instrument in collaboration with a team lead by the Principal Investigator, René Doyon of the Université de Montréal. Additional technical support was provided by the National Research Council of Canada's Herzberg Astronomy and Astrophysics Research Centre.

Mid-Infrared Instrument

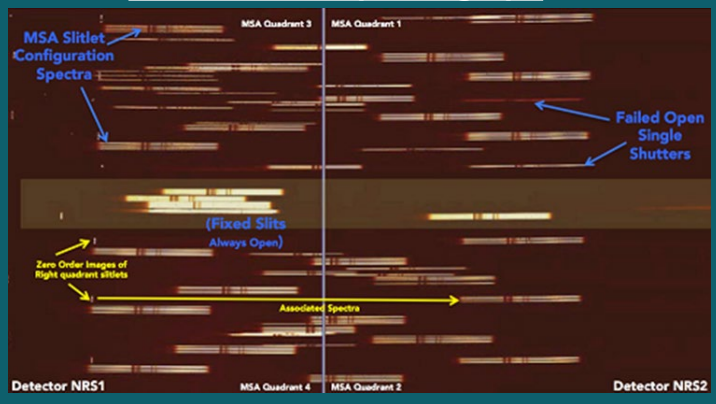


Simulated MIRI MRS observation illustrating an uncalibrated detector image (upper left panel) and the corresponding three-dimensional data cube (upper right panel) and extracted one-dimensional spectrum (lower panel).

The Mid-Infrared Instrument (MIRI) provides JWST observers with coverage of mid-infrared wavelengths from 4.9 to 28.8 µm. Imaging can be obtained with 9 broad-band filters covering the wavelength ranges from 5.6µm to 25.5 µm. Spectroscopy can be obtained with a low spectral resolving power mode from 5-12 µm that includes both slitted and slitless options, or with a medium spectral resolving power integral field unit from 4.9 µm-28.8 µm. MIRI also contains one Lyot and three 4-quadrant phase mask coronagraphs that are optimized to the mid-infrared spectral region.

MIRI was developed through a collaboration between the European Consortium and the Jet Propulsion Laboratory (JPL). The European MIRI Principal Investigator is Gillian Wright (UK Astronomy Technology Centre), and the U.S. Principal Investigator is George Rieke (University of Arizona). The MIRI Instrument Scientists are Alistair Glasse at UKATC and Michael Ressler at JPL.

Near-Infrared Spectrograph



An example of NIRSpec MOS mode spectra taken with a calibration flat field lamp, providing uniform illumination, and example MSA shutter slitlets using the G140M+F100LP spectral configuration.

JWST's Near-Infrared Spectrograph (NIRSpec) is a versatile spectroscopic instrument that operates in the 0.6 to 5.3 µm wavelength range. NIRSpec offers high throughput single object spectroscopy through fixed slits, spatially-resolved integral field unit spectroscopy, and a powerful multi-object spectroscopic mode using a micro-shutter assembly. NIRSpec also has a bright object time series mode through a wide aperture that provides high throughput/high accuracy spectrophotometric monitoring capabilities to the astronomical community.

NIRSpec was built for the European Space Agency by Airbus Industries with the Micro-Shutter Array (MSA) and detector sub-systems fabricated by NASA. Pierre Ferruit is the NIRSpec Principal Investigator.

Astronomers Dream Big, Consider Four Future Space Telescopes

The release of the Astro2020 Decadal Survey is imminent, in which four concepts compete to become NASA's next flagship mission. From exo-Earths to X-rays, what will the future hold?

MISSION CONCEPTS IN A NUTSHELL

Mission	Primary Mirror	Wavelengths Covered	Instruments	Primary Innovation	Science Goals
HabEx	4 m (off-axis secondary)	Ultraviolet, visible, near-infrared	• Coronagraph • Starshade imagers and spectrographs • General astrophysics visible/IR imager and spectrograph • UV/visible imager and spectrograph	52-meter starshade flying 76,000 km from telescope	• Detect and characterize exoplanets, including ~10 exo-Earths candidates • Map out nearby planetary systems • Galactic and extragalactic astrophysics, solar system astrophysics
LUVOIR	8–15 m	Ultraviolet, visible, near-infrared	• Imager • Multi-object UV spectrograph • Coronagraph • Spectropolarimeter	Unprecedentedly stable large mirror	• Detect and characterize ~100 exoplanets • Birth of stars and planets • Galaxy evolution • Cosmology (dark matter, dwarf galaxies)
Lynx	3 m	X-rays	• Imager • Microcalorimeter • Grating spectrometer	Thousands of thin X-ray-reflecting mirrors nested inside each other	• Detect the first black holes • Reveal what drives galaxy formation and evolution • Unveil the energetic side of stellar evolution and stellar ecosystems
Origins	5.9 m	Mid-/far-infrared	• Mid-IR spectrometer • Far-IR survey spectrometer • Far-IR imager and polarimeter	Ultra-cold telescope (4.5 K) and next-generation detectors	• Galaxy, star, and black hole formation and co-evolution over cosmic time • Planet formation and the development of habitability • Exoplanet characterization and the search for biosignatures • Discovery space opened by a thousand-fold sensitivity gain

It's not quite fair to say that these mission concepts are competing against each other. After all, as Seager reminds us, "The decadal survey is under no obligation to choose one of the four." After the bloated JWST mission, will the scientific community choose to greenlight another ambitious "Greater Observatory" — or press pause on flagship development?

(Source: skyandtelescope.org)

Ritchie Observatory Upgrades

The conversion of the old "Doghouse" to the "Star Portal" is nearly complete.

The new restroom is also nearly done. Once that work completes, the Porta Potty will be removed. And while I can honestly say there were times I was very glad it was there, I definitely am not shedding any tears over its retirement.

The pending Internet upgrade is awaiting completion of the Star Portal, on which the new internet antenna will be mounted. This antenna will connect the observatory to the park's broadband internet, and a wifi router inside the building will connect to the club's computers. It will be great to finally have more reliable connectivity at the Observatory!

The Bainbridge Amateur Radio Club (BARC) successfully tested a temporary HAM antenna configuration and subsequently installed a semipermanent dipole antenna on the roof. Together with a high-frequency transceiver, antenna tuner, and computer set up in the workroom on the second floor, this equipment will enable BARC members to contact other ham stations worldwide, especially now that solar activity is picking up and energizing the ionosphere.

NASA Is Looking For a Framework to Better Help You Understand Its Deep Space Finds

Is there life on other planets? It's a simple question without a simple answer. "The expectation, in particular with the public, is a yes-or-no answer. Did you find it or didn't you find it?" Jim Green, NASA's chief scientist, told NPR.

But Green says the reality is much more complex. One scientific discovery about extraterrestrial life may give us a small new insight into the universe, but it may be exaggerated by researchers or misunderstood by the public.

That's why Green and NASA are proposing a scale to better contextualize new findings in research about extraterrestrial life and help explain those discoveries to the public.

In an article in Nature, Green and other NASA scientists propose a seven-step rubric for understanding new discoveries. It starts with the remote detection of something that could hint at life and progresses to ruling out non-biological factors, making actual observations and finally conducting follow-up observations to be sure that life exists.

The scientists say their scale is just a proposal, and they're looking for the scientific community to weigh in and improve it.

According to the article, an objective standard is needed now because the current generation of scientists may be the one to discover life beyond Earth.

(Source: npr.org)

If NASA Greenlights This Interstellar Mission, It Could Last 100 Years

NASA's twin Voyager spacecraft, launched in 1977, have been traveling for so long that they've left our solar system. Amazingly, these venerable probes still talk to Earth, but their plutonium-powered energy supply is getting ever closer to running out.

That's why NASA asked a team of scientists and engineers to come up with a successor mission that could pick up where the Voyagers left off. The group, which will finish a report on their work within weeks, has designed a practical, doable spacecraft that could go faster than the Voyagers and much farther out into interstellar space.

"It's always hard to talk about transition plans," says Ralph McNutt of the Johns Hopkins University Applied Physics Laboratory, who leads the team working on this proposed mission. "Typically, it hasn't really been happening in most space missions. But on this one, it's going to be front and center."

No one could have known that the Voyager spacecraft would last so long; they originally were built to survive for only about five years, so that they could visit Jupiter and Saturn. But the hardware kept working, and so NASA added on flybys of Uranus and Neptune.

But unfortunately, "we're just flat running out of power," says McNutt. The science team has been thinking of clever ways to conserve what's left to keep the Voyagers going for as long as possible. "We're looking at which instrument gets to have their heaters all turned off first."

Their proposed probe relies on technology that's either tried-and-true or already far along in development, with a price tag similar to the recent Parker Solar Probe, which was recently sent hurtling toward the sun at a cost of $1.5 billion.

If NASA decides to build this probe, it could launch in 2036 and boldly venture forth for a minimum of 50 years and possibly more than a century. That means it would have the longest planned duration of any NASA mission, by a long shot.

Agency officials would have to cope with all of its technology inevitably going obsolete — to say nothing of all the people involved in the mission getting older and dying.

(Source: npr.org)

The Roots of Jupiter's Great Red Spot Run Deep

This JunoCam image of Jupiter's south temperate belt and Great Red Spot was taken on Dec. 30, 2020. Image data: NASA/JPL-Caltech/SwRI/MSSSImage processing: Navaneeth Krishnan S CC BY

Just how far down does Jupiter's iconic Great Red Spot go? The deep roots of the centuries-long storm could be a clue to its longevity, according to new results announced by the team behind NASA's Juno mission.

Previous work using the microwave radiometer of NASA's Juno spacecraft, still zipping around the giant planet every 53 days, probed the depths of the Great Red Spot. But while microwaves can help scientists peel back the top cloud layers, the microwave observations could only show that the Great Red Spot is still going strong 200 kilometers (120 miles) below the cloudtops.

Now, a study in the October 28th Science now puts a bottom limit to its depth. Juno scientist Marzia Parisi (NASA's Jet Propulsion Laboratory) led an effort utilizing two Juno passes that had the spacecraft zipping right over the Great Red Spot. The team also analyzed data from another 10 passes.

Parisi and colleagues report that the Great Red Spot extends at most 500 km down. The bulk of the storm's mass is probably within the top 300 km or so. "Most of scientific community was thinking the Great Red Spot was shallow," Parisi says. "We were surprised that it goes so deep."

Despite shrinking over the past few decades, the Great Red Spot is still wider than Earth's diameter. So the storm itself is somewhat pancake-shaped — just a thicker pancake than scientists had expected. For context, Jupiter's stripes, the brown-red belts and whitish zones, extend much deeper, down to about 3,000 km, or about 4% of the way to the core.

Nevertheless, the unexpected depth means that the pumpkin-colored vortex is rooted beneath the water condensation layer, indeed beneath the entire cloud layer, and well beneath the reach of sunlight. The finding gives scientists food for thought as they puzzle over the mechanisms that might drive the storm.

(Source: skyandtelescope.org)

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Did We Find a Planet In Another Galaxy?

Astronomers using an innovative method have detected the signal of what could be an extragalactic exoplanet. But confirming its existence will be difficult.

The Milky Way is awash in planets: We've found almost 5,000 of them to date, not counting thousands more classified as more nebulous "candidates." This planetary abundance must exist in other galaxies, too, but the usual techniques can't reach far enough to tell.

Now astronomers, led by Rosanne Di Stefano (Center for Astrophysics, Harvard & Smithsonian) have found a possible extragalactic exoplanet, or as they call it, extroplanet, with results published in Nature Astronomy. But even if it's real, it's residing in a pretty inhospitable environment: around a black hole. Specifically, the candidate planet orbits an X-ray-emitting binary system (XRBs), where a black hole or neutron star siphons material off a companion star.

Key to the method is the relative size of the emission: As stellar material spirals into the black hole, the stuff nearest the maw — a relatively small region — heats up and emits X-rays. A planet passing in front of this region could block most or all of its radiation, for a period of minutes for an Earth-size planet, up to hours for a Jupiter-size world.

The hunt struck gold in the Whirlpool Galaxy, which lies 28 million light-years away. There, the bright XRB M51-ULS-1 system hosts what is likely a black hole feeding off a massive, bright-blue star. The spiraling stellar material makes up an X-ray-emitting region some 50,000 kilometers (30,000 miles) across. Then the astronomers watched the brightness suddenly drop by a factor of 10, staying dim for three hours before returning to baseline.

While we may never know if a planet caused this particular dip in X-rays, the observations provide a proof of concept that Di Stefano and colleagues hope to use for future discoveries, both in other galaxies and in the Milky Way. "This is how we will learn the most in the near future," Di Stefano says.

Even if we never make contact with civilizations in other galaxies, by this method we may at least be able to tell if extragalactic planet populations are like our own.

(Source: skyandtelescope.org)

WHAT'S UP(COMING)!

Nov 4 – New Moon
Nov 7 – 67P/Churyumov-Gerasimenko reaches its brightest
Nov 12 – Northern Taurid shower peak
Nov 17 – Leonid shower peak
Nov 19 – Full Moon
Partial lunar eclipse
Nov 21 – α-Monocerotid shower peak
Nov 28 – November Orionid shower peak
Dec 2 – Pheonicid shower peak
Dec 3 – New Moon
Dec 6 – December ϕ-Cassiopeid meteor shower peak
Dec 7 – Puppid-Velid meteor shower peak
Dec 9 – Monocerotid meteor shower peak
Dec 12 – σ-Hydrid meteor shower peak
Dec 13 – Venus at highest altitude in evening sky
Dec 14 – Geminid meteor shower peak
Dec 16 – Comae Berenicid meteor shower peak
Dec 18 – Full Moon
Dec 19 – December Leonis Minorid meteor shower peak
Dec 21 – December solstice
Dec 22 – Ursid meteor shower peak
Jan 2 – New Moon
Jan 3 – Quadrantid meteor shower peak
Jan 12 – Mercury at highest altitude in evening sky
Jan 17 – Full Moon
Jan 19 – γ-Ursae Minorid meteor shower peak