WEYMOUTH ASTRONOMY

Sky Watcher

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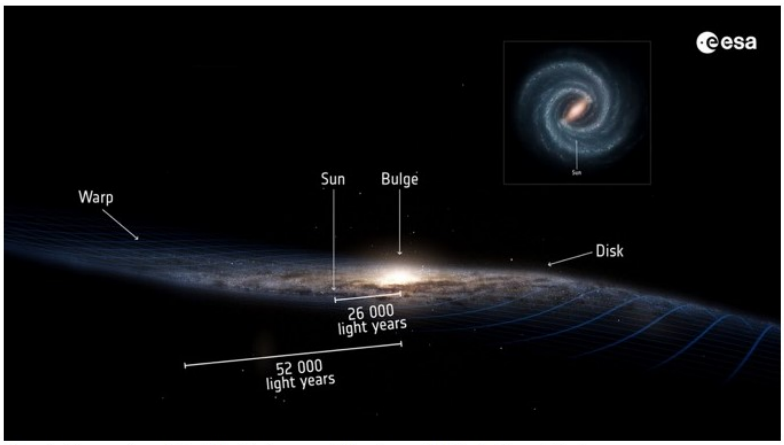
Greetings to all of the WAC members and friends! During this challenging time, we hope that Astronomy is able to fill a gap for positive thinking with the admiration and wonder of the amazing universe we live in.

On page 2, there is an article on the fascinating results that the GAIA mission is starting to reveal. It discusses the amazing warp detected in our home galaxy detected using GAIA data.

During this time, perhaps you can jot a few notes on how Astronomy is part of your life for sharing in the next Sky Watcher. Look forward to hearing from you! sherikarl@rocketmail.com

Until next time...SLK



An artist's impression of the Milky Way's warped disc. Image: ESA/Stefan Payne-Wardenaar

Trips / Events

Ideas for trips and events always welcome!

events@weymouthastronomy.co.uk

Society Meetings cancelled until further notice— Please check the website for the latest schedule

Upcoming:

- **5 May WAS - *The Gas Giants by* Steve Hill**
- **20 May CADAS—The Hubble Space Telescope – one month to save the telescope by Graham Bryant**

If you are interested in giving a talk or workshop, let the organisers know. They like to offer new titles in their programme line-up.

Hubble at 30: Three Decades of Cosmic Discovery

by David Prosper

The **Hubble Space Telescope** celebrates its 30th birthday in orbit around Earth this month! It's hard to believe how much this telescope has changed the face of astronomy in just three decades. It had a rough start -- an 8-foot mirror just slightly out of focus in the most famous case of spherical aberration of all time. But subsequent repairs and upgrades by space shuttle astronauts made Hubble a symbol of the ingenuity of human spaceflight and one of the most important scientific instruments ever created. Beginning as a twinkle in the eye of the late Nancy Grace Roman, the Hubble Space Telescope's work over the past thirty years changed the way we view the universe, and more is yet to come!

We've all seen the amazing images created by Hubble and its team of scientists, but have you seen Hubble yourself? You actually can! Hubble's orbit – around 330 miles overhead -- is close enough to Earth that you can see it at night. The best times are within an hour after sunset or before sunrise, when its solar panels are angled best to reflect the light of the Sun back down to Earth. You can't see the structure of the telescope, but you can identify it as a bright star-like point, moving silently across the night sky. It's not as bright as the Space Station, which is much larger and whose orbit is closer to Earth (about 220

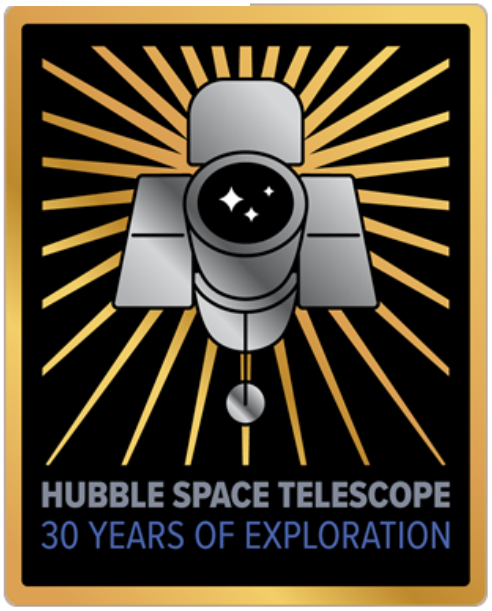


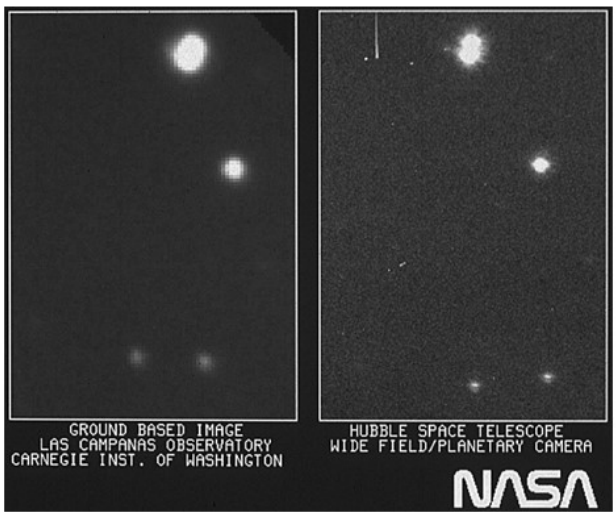
Image Credit: NASA

WAC Upcoming Events:

Meeting room cancelled until further notice.	Watch website for online options.
1st May	AGM + John Macdonald - Space Weather
12th June	James Fradgley - How (on Earth) did life
JULY	NO MEETING

Hubble (more!)

miles), but it's still very noticeable as a single steady dot of light, speeding across the sky. Hubble's orbit brings it directly overhead for observers located near tropical latitudes; observers further north and south can see it closer to the horizon. You can find sighting opportunities using satellite tracking apps for your smartphone or tablet, and dedicated satellite tracking websites. These resources can also help you identify other satellites that you may see passing overhead during your stargazing sessions.



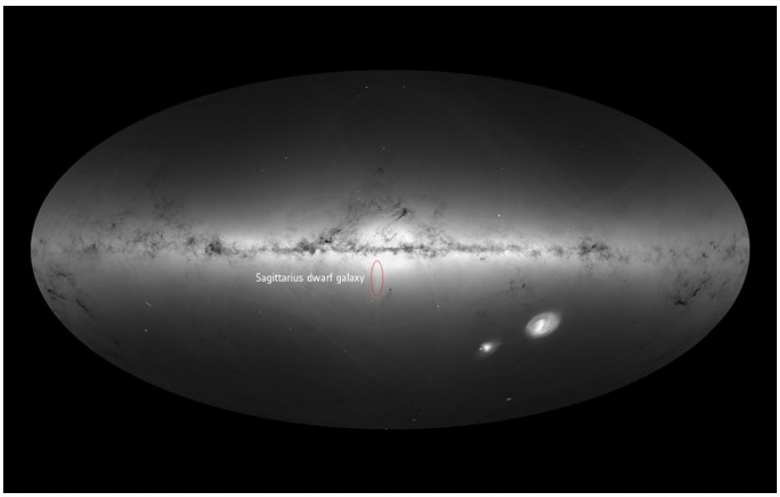
Hubble's "first light" image. Even with the not-yet-corrected imperfections in its mirror, its images were generally sharper compared to photos taken by ground-based telescopes at the time. Image Credit: NASA

NASA has a dedicated site for Hubble's 30th's anniversary at bit.ly/NASAHubble30. The Night Sky Network's "Why Do We Put Telescopes in Space?" activity can help you and your audiences discover why we launch telescopes into orbit, high above the interference of Earth's atmosphere, at bit.ly/TelescopesInSpace. Amateur astronomers may especially enjoy Hubble's images of the beautiful objects found in both the Caldwell and Messier catalogs, at bit.ly/HubbleCaldwell and bit.ly/HubbleMessier. As we celebrate Hubble's legacy, we look forward to the future, as there is another telescope ramping up that promises to further revolutionize our understanding of the early universe: the James Webb Space Telescope! Discover more about the history and future of Hubble and space telescopes at nasa.gov.

GAIA data indicates ongoing collision causing Milky Way's warp 4 March 2020

The European Space Agency's star-mapping Gaia satellite confirms the Milky Way's disc is warped, curving slightly down on one side and up on the other, a gravitational disturbance that may have been caused by a collision with a smaller galaxy. Astronomers have known since the 1950s that the galactic disc, where most of the Milky Way's stars reside, is warped, and multiple theories have been suggested to explain it. One possibility was the effects of the intergalactic magnetic field. Another was the gravitational effects of an asymmetric halo of dark matter.

The Gaia data confirms the warp's existence and as well as previous hints that it changes orientation, precessing as the galaxy rotates like the wobble of a spinning top. And the speed of that precession is faster than earlier explanations would allow, raising the possibility of a more powerful influence. Like a galactic collision. "We measured the speed of the warp by comparing the data with our models," said Eloisa Poggio of the Turin Astrophysical Observatory in Italy and the lead author of a study published in Nature Astronomy. "Based on the obtained velocity, the warp would complete one rotation around the centre of the Milky Way in 600 to 700 million years. That's much faster than what we expected based on predictions from other models, such as those looking at the effects of the non-spherical halo." The Sun completes one orbit around the Milky Way's core ever 220 million years. "The Sun is at the distance of 26,000 light years from the galactic centre where the amplitude of the warp is very small," Poggio said. "Our measurements were mostly dedicated to the outer parts of the galactic disc, out to 52,000 light years from the galactic centre and beyond."



In an on-going collision/merger, the Sagittarius dwarf galaxy may be responsible for the observed warpage of the Milky Way's disc. Image: ESA/Gaia/DPAC,CC BY-SA 3.0 IGO

The data do not indicate which galaxy might have collided with the Milky Way or when the collision began. One contender is a dwarf galaxy known as Sagittarius, which may have blown through the Milky Way's disc several times and probably will be eventually absorbed. "With Gaia, for the first time, we have a large amount of data on a vast amount stars, the motion of which is measured so precisely that we can try to understand the large scale motions of the galaxy and model its formation history," said Jos de Bruijne, Gaia deputy project scientist. "This is something unique. This really is the Gaia revolution."