The in-person restart 26th September, 2022

The Abergavenny Astronomy Society held its inaugural meeting on 8th November 2010.

Meetings were held twice a month until the dreaded COVID struck!

The last face to Face for AAS was the 13th March, 2020 – 2½ years ago.

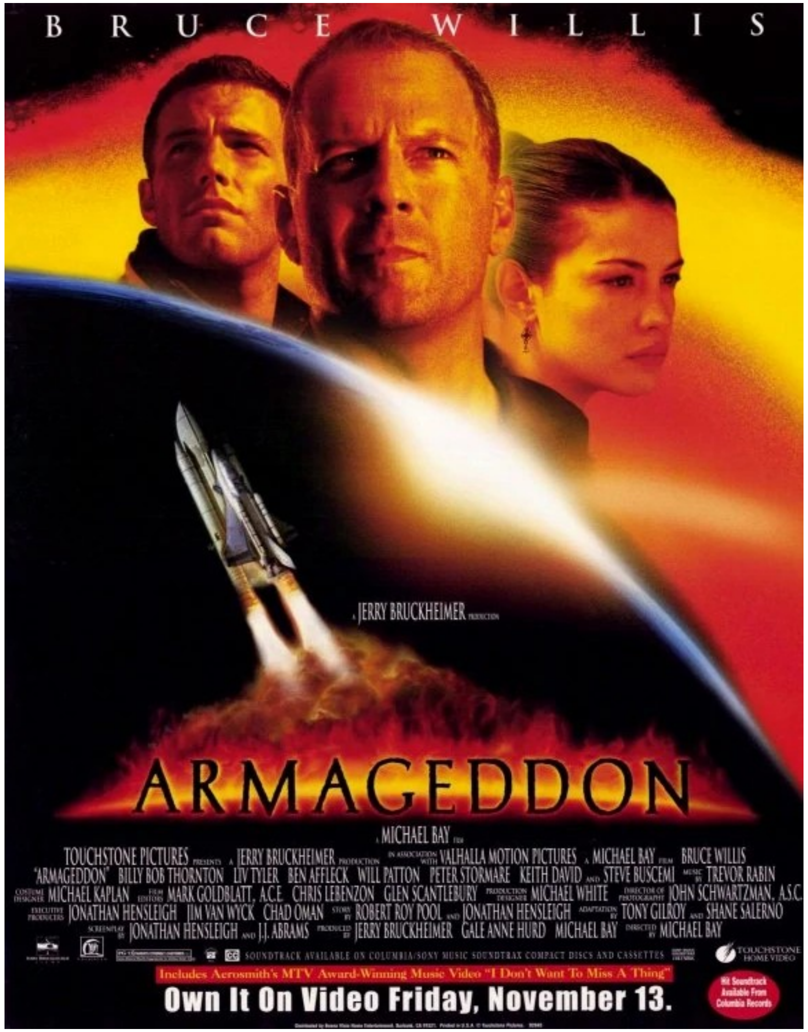
Zoom meetings have been operating, organised by Usk AS.

So, after 30 months it is time to resurrect Astronomy meetings in Abergavenny.

So, how do we go forward into 2023? Some suggestions:-

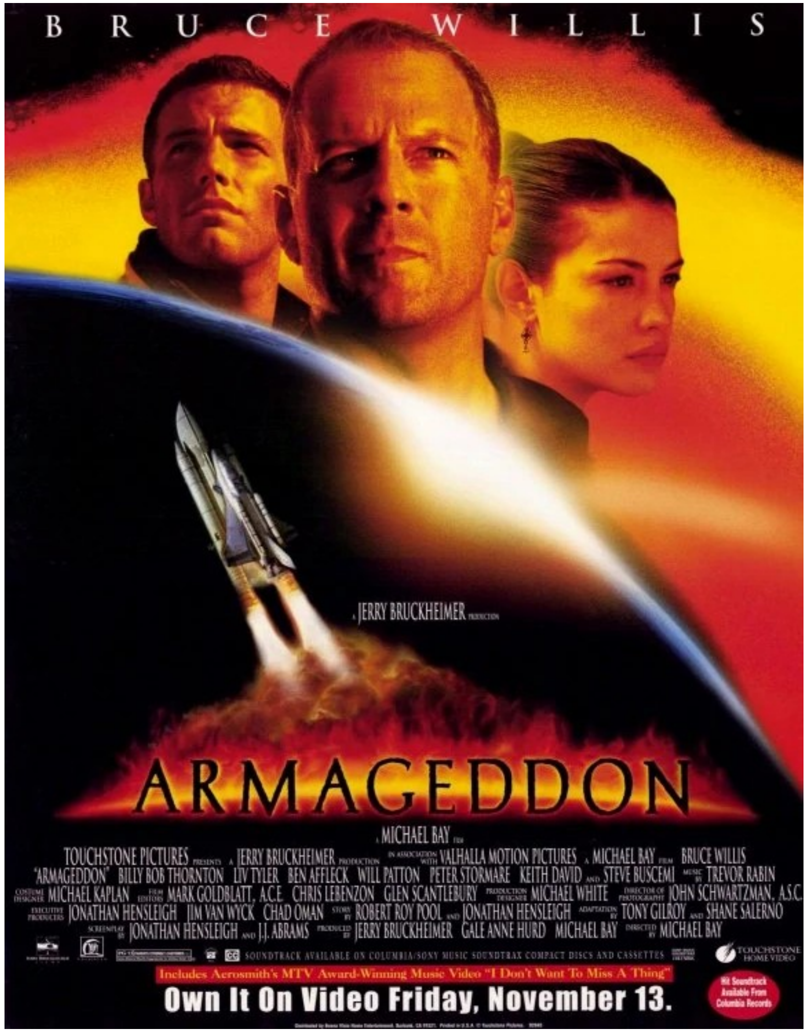
- -Re-locating our sessions to the Hen & Chicks. The Kings Head is having upgrade work carried out.
- -Start off with one meeting per month (4th Monday of month). To see how it goes and to allow us to investigate/organise possible external speakers.
- -Public launch type event, eg the Usk Planetarium show. Maybe in November?
- -To continue with the "Back to Basics" series we started in 2020 which seemed to be popular. Topics to be covered are basic astronomy and observing.
- -Encourage members to give short, informal chats on topics that are of interest to them – **NO PRESS GANGING** though!

Saving the planet!!



What is a Hollywood blockbuster to do with the Abergavenny Astronomy Society?

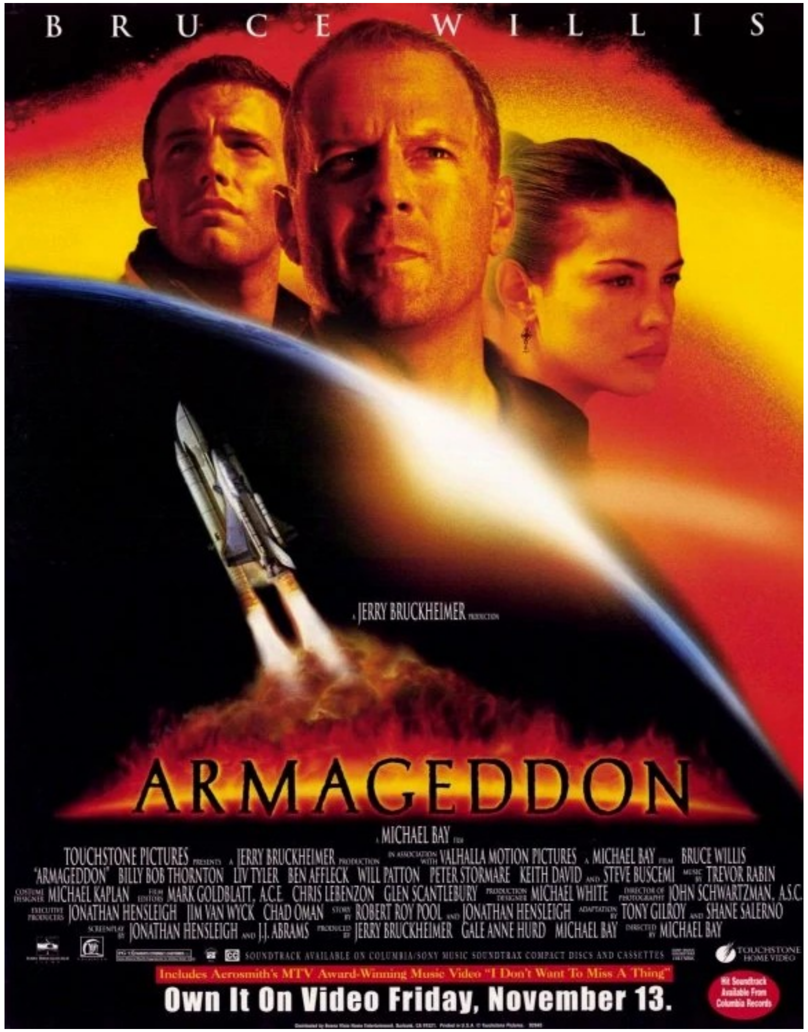
Saving the planet!!



What is a Hollywood blockbuster to do with the Abergavenny Astronomy Society?

Just think NASA Dart Mission

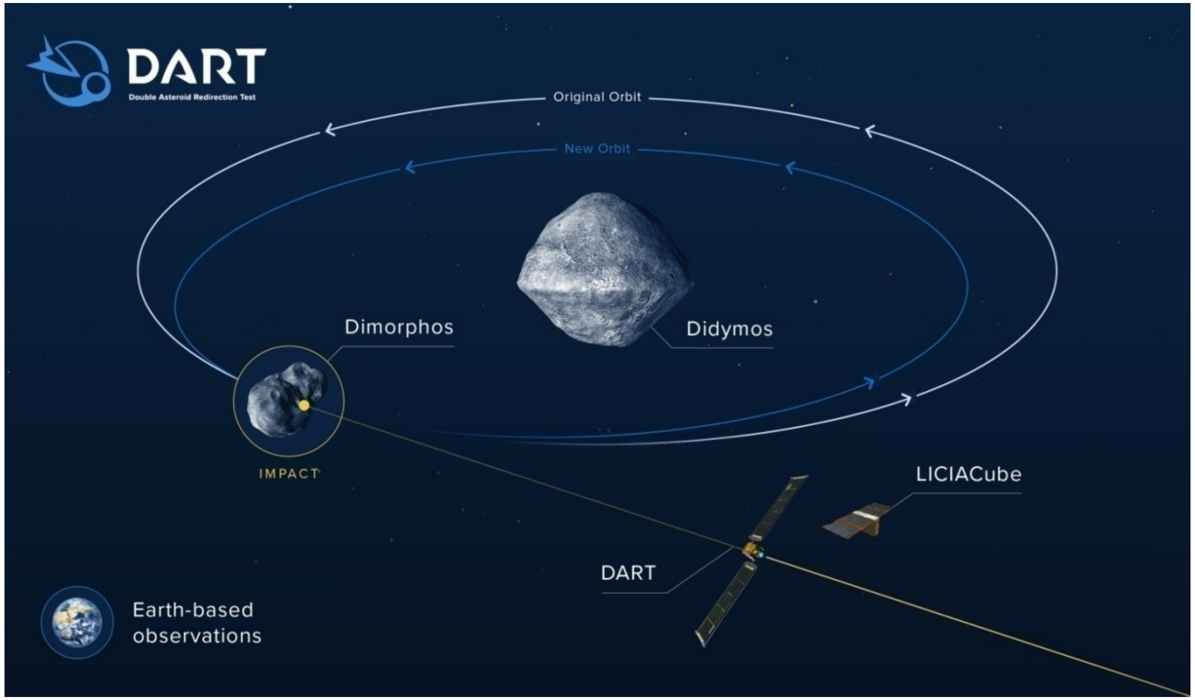
Saving the planet!!



What is a Hollywood blockbuster to do with the Abergavenny Astronomy Society?

Just think NASA Dart Mission

As a point of interest, from IMDB.com:-
NASA shows this film during their management training program. New managers are given the task of trying to spot as many errors as possible. At least 168 have been found.



DART is a mission to test the concept of nudging a body that is threatening the Earth's destruction so that it misses us.

The target is a small companion (Dimorphos) orbiting the asteroid Didymos.
This body is 10 million km away & poses **NO THREAT** to the earth

Mission climax is the 26th Sept, around midnight.

Didymos is around 780m diameter whereas Dimorphos is around 160m with a mass of some 5 million tonnes (cf 0.5T for DART)

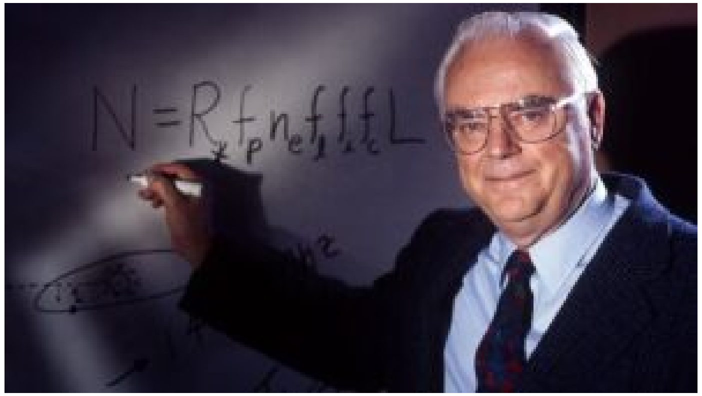
The plan is to crash the DART spacecraft into Dimorphos at 14,000 mph and measure what effect the impact has.

It is hoped that its orbital period will be reduced by roughly 10mins, thus causing a change in it's trajectory.

FRANK DONALD DRAKE

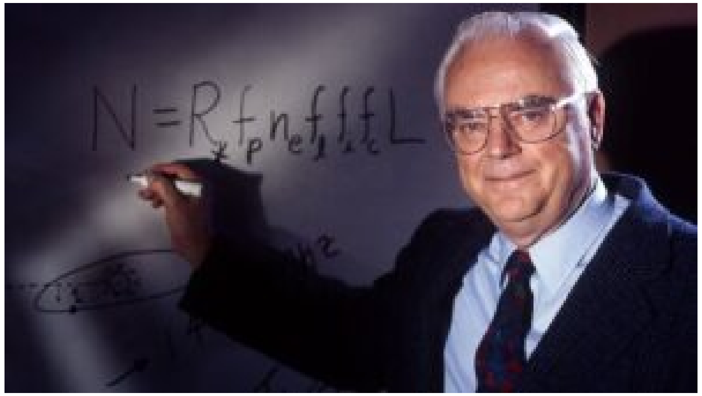
May 28, 1930—September 2, 2022

Frank Drake died peacefully at home in Aptos, California of natural causes. He was 92.



Frank Drake posed in front of a white board with his eponymous equation. (Source: SETI Institute)

FRANK DONALD DRAKE
May 28, 1930—September 2, 2022
Frank Drake died peacefully at home in Aptos, California of natural causes. He was 92.



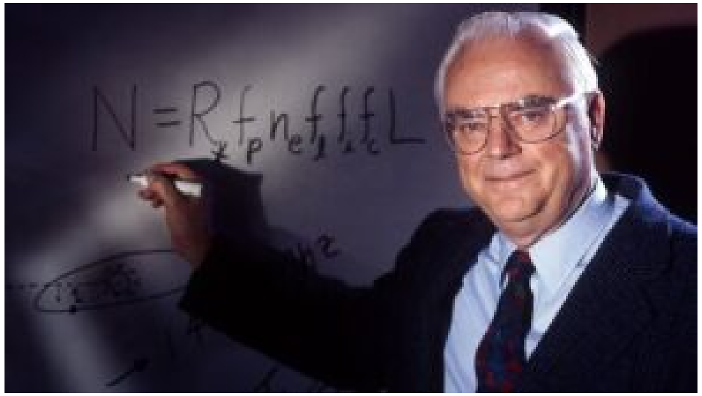
Frank Drake posed in front of a white board with his eponymous equation. (Source: SETI Institute)

His equation is an effort to estimate the number of communicative civilizations in the Galaxy.

He was also the creator of the first ever SETI search, one who refined ideas and methods in the field for decades.

As the designer of the Arecibo message and co-designer of the Pioneer plaques and Voyager Golden Records, his legacy lives on, travelling though the Galaxy in search of another planet's astronomers.

FRANK DONALD DRAKE
May 28, 1930—September 2, 2022
Frank Drake died peacefully at home in Aptos, California of natural causes. He was 92.



Frank Drake posed in front of a white board with his eponymous equation. (Source: SETI Institute)

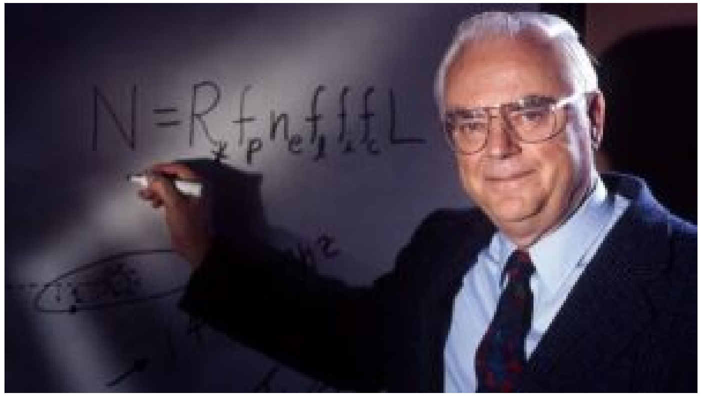
His equation is an effort to estimate the number of communicative civilizations in the Galaxy.

He was also the creator of the first ever SETI search, one who refined ideas and methods in the field for decades.

As the designer of the Arecibo message and co-designer of the Pioneer plaques and Voyager Golden Records, his legacy lives on, travelling though the Galaxy in search of another planet's astronomers.

The Drake equation is:- $N = R_* \cdot f_p \cdot n_e \cdot f_l \cdot f_i \cdot f_c \cdot L$	**1961 est**
N = the number of civilizations in our galaxy with which communication might be possible; and	$=L=10^3 - 10^8$
R_* = the average rate of star formation in our Galaxy	1 / year
f_p = the fraction of those stars that have planets	0.2 – 0.5
n_e = the average number of planets that can potentially support life per star that has planets	1 - 5
f_l = the fraction of planets that could support life that actually develop life at some point	1
f_i = the fraction of planets with life that actually go on to develop intelligent life (civilizations)	1
f_c = the fraction of civilizations that develop a technology that releases detectable signs of their existence into space	0.1 – 0.2
L = the length of time for which such civilizations release detectable signals into space	$10^3 - 10^8$

FRANK DONALD DRAKE
May 28, 1930—September 2, 2022
Frank Drake died peacefully at home in Aptos, California of natural causes. He was 92.



Frank Drake posed in front of a white board with his eponymous equation. (Source: SETI Institute)

His equation is an effort to estimate the number of communicative civilizations in the Galaxy.

He was also the creator of the first ever SETI search, one who refined ideas and methods in the field for decades.

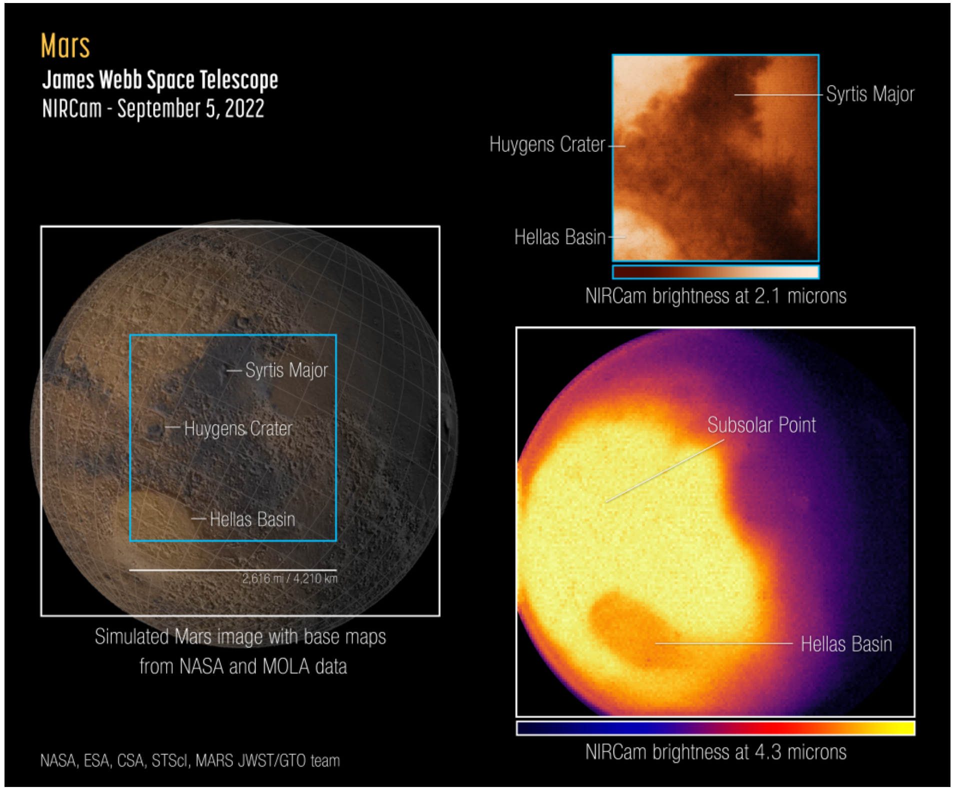
As the designer of the Arecibo message and co-designer of the Pioneer plaques and Voyager Golden Records, his legacy lives on, travelling though the Galaxy in search of another planet's astronomers.

The Drake equation is:- N = $R_* \bullet f_p \bullet n_e \bullet f_l \bullet f_i \bullet f_c \bullet L$ **1961 est**

	1961 est
N = the number of civilizations in our galaxy with which communication might be possible; and	=L=10^3 - 10^8
R_* = the average rate of star formation in our Galaxy	1 / year
f_p = the fraction of those stars that have planets	0.2 – 0.5
n_e = the average number of planets that can potentially support life per star that has planets	1 - 5
f_l = the fraction of planets that could support life that actually develop life at some point	1
f_i = the fraction of planets with life that actually go on to develop intelligent life (civilizations)	1
f_c = the fraction of civilizations that develop a technology that releases detectable signs of their existence into space	0.1 – 0.2
L = the length of time for which such civilizations release detectable signals into space	10^3 - 10^8

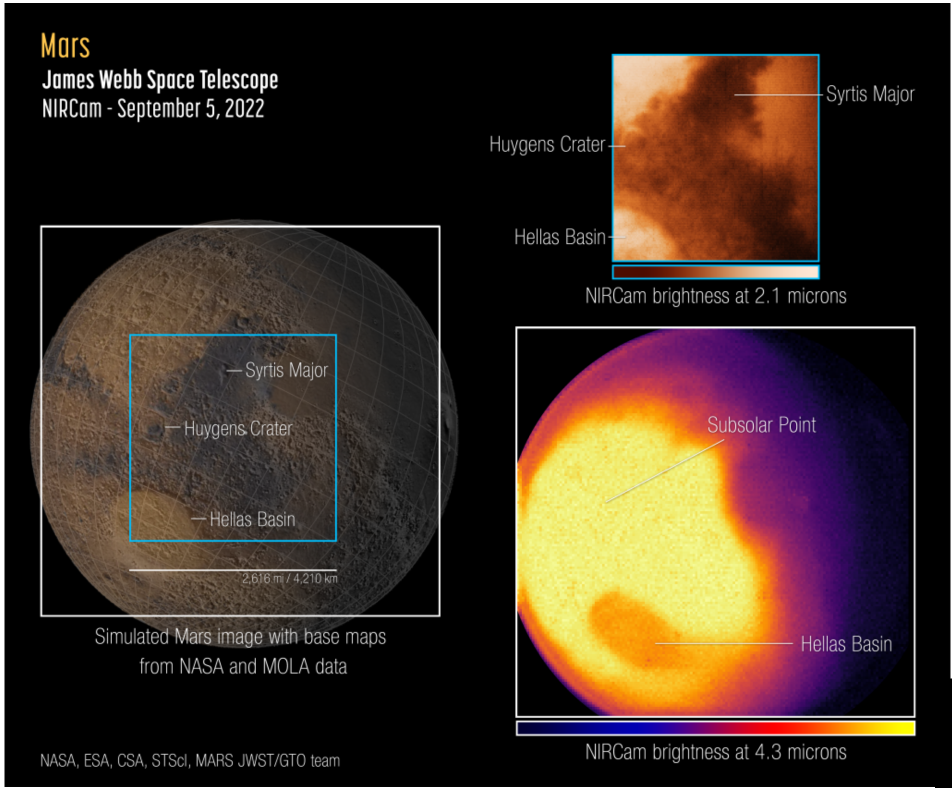
Attempts to "solve" the Drake equation since have thrown up numbers from 10^{-12} (ie zero) to 15 million!!

A SELECTION OF PHOTOS FROM THE JWST : MARS

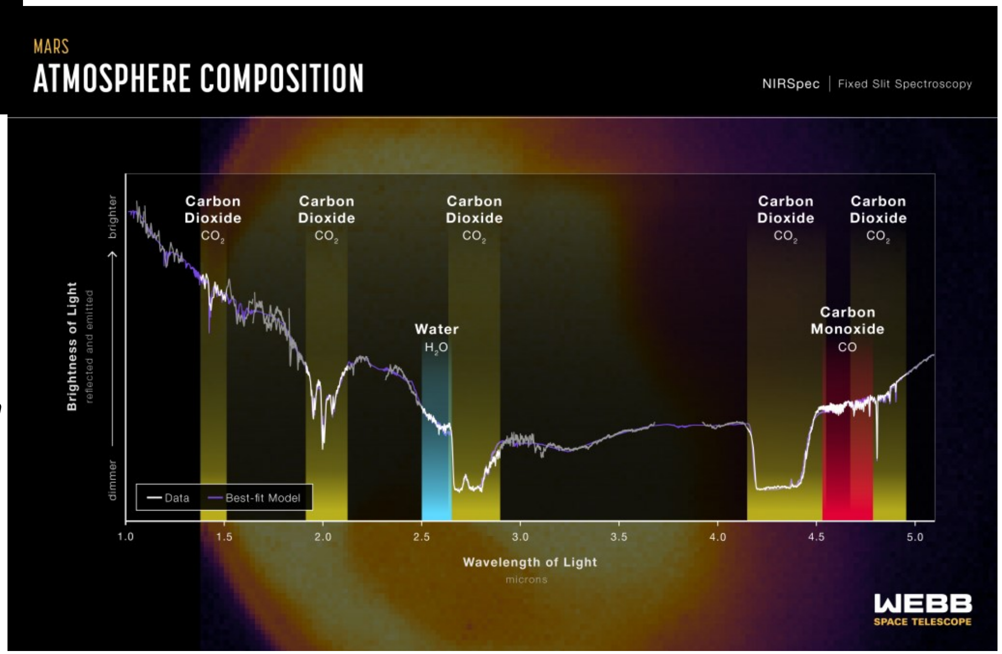


Webb's first images of Mars, captured by its NIRCam instrument Sept. 5, 2022 [Guaranteed Time Observation Program 1415]. Left: Reference map of the observed hemisphere of Mars from NASA and the Mars Orbiter Laser Altimeter (MOLA). Top right: NIRCam image showing 2.1-micron (F212 filter) reflected sunlight, revealing surface features such as craters and dust layers. Bottom right: Simultaneous NIRCam image showing ~4.3-micron (F430M filter) emitted light that reveals temperature differences with latitude and time of day, as well as darkening of the Hellas Basin caused by atmospheric effects. The bright yellow area is just at the saturation limit of the detector.
Credit: NASA, ESA, CSA, STScI, Mars JWST/GTO team

A SELECTION OF PHOTOS FROM THE JWST : MARS

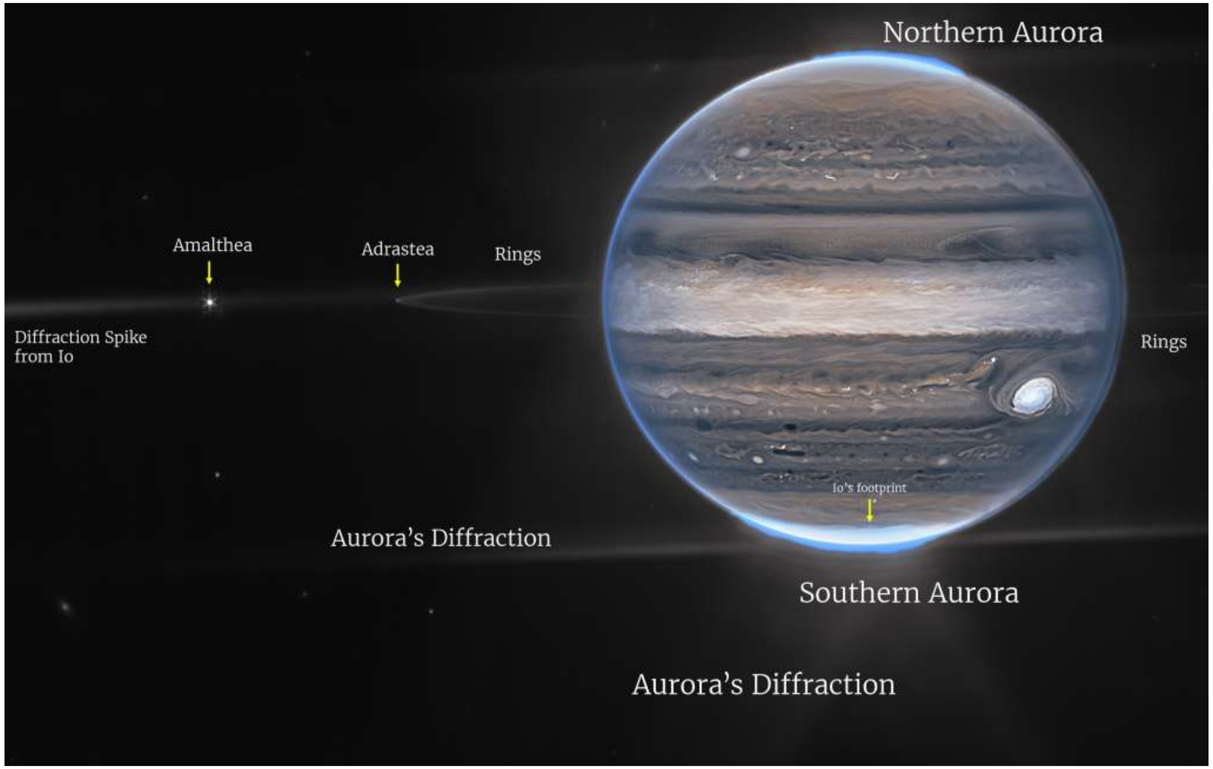


Webb's first images of Mars, captured by its NIRCam instrument Sept. 5, 2022 [Guaranteed Time Observation Program 1415]. Left: Reference map of the observed hemisphere of Mars from NASA and the Mars Orbiter Laser Altimeter (MOLA). Top right: NIRCam image showing 2.1-micron (F212 filter) reflected sunlight, revealing surface features such as craters and dust layers. Bottom right: Simultaneous NIRCam image showing ~4.3-micron (F430M filter) emitted light that reveals temperature differences with latitude and time of day, as well as darkening of the Hellas Basin caused by atmospheric effects. The bright yellow area is just at the saturation limit of the detector.
Credit: NASA, ESA, CSA, STScI, Mars JWST/GTO team



Webb's first near-infrared spectrum of Mars, captured by the Near-Infrared Spectrograph (NIRSpec) Sept. 5, 2022, as part of the Guaranteed Time Observation Program 1415, over 3 slit gratings (G140H, G235H, G395H). The spectrum is dominated by reflected sunlight at wavelengths shorter than 3 microns and thermal emission at longer wavelengths. Preliminary analysis reveals the spectral dips appear at specific wavelengths where light is absorbed by molecules in Mars' atmosphere, specifically carbon dioxide, carbon monoxide, and water. Other details reveal information about dust, clouds, and surface features. By constructing a best-fit model of the spectrum, by the using, for example, the Planetary Spectrum Generator, abundances of given molecules in the atmosphere can be derived.
Credit: NASA, ESA, CSA, STScI, Mars JWST/GTO team

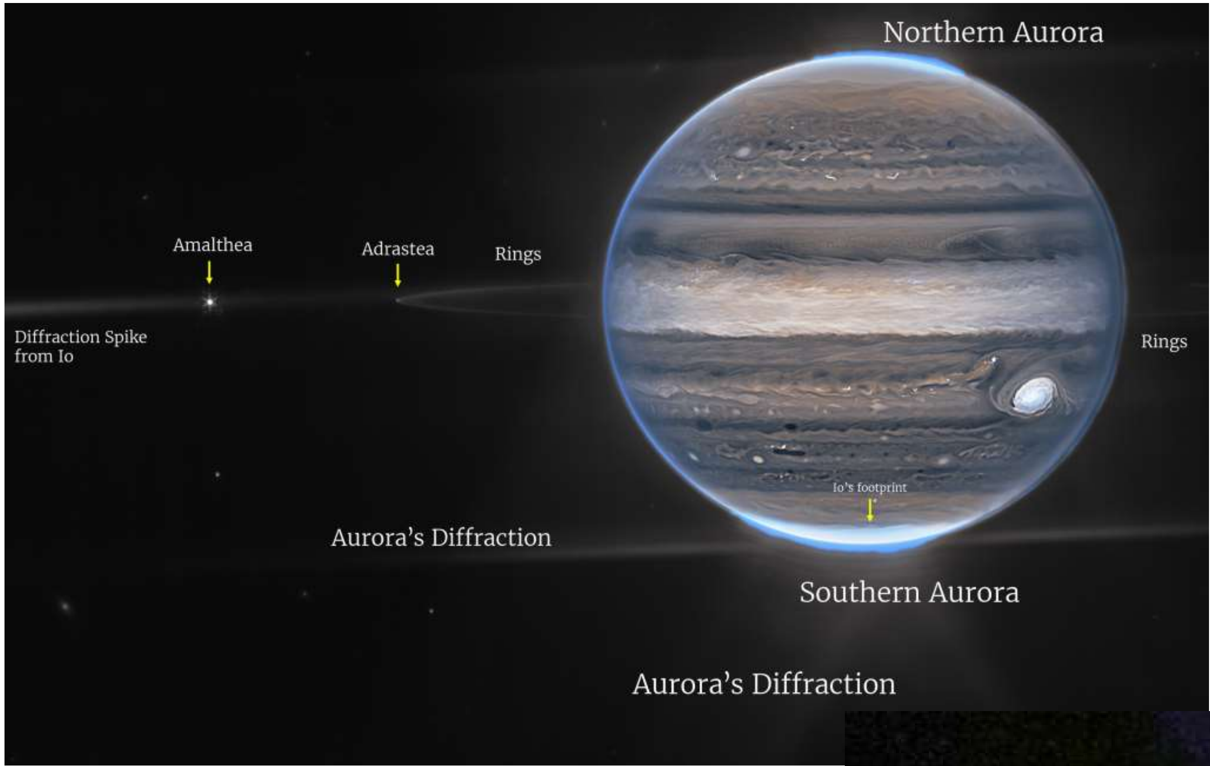
A SELECTION OF PHOTOS FROM THE JWST : PLANETS (JUPITER & NEPTUNE)



Webb NIRCam composite image from two filters – F212N (orange) and F335M (cyan) – of Jupiter system. Credit: NASA, ESA, CSA, Jupiter ERS Team; image processing Ricardo Hueso (UPV/EHU) & Judy Schmidt.

Citizen scientist Judy Schmidt

A SELECTION OF PHOTOS FROM THE JWST : PLANETS (JUPITER & NEPTUNE)



Webb NIRCam composite image from two filters – F212N (orange) and F335M (cyan) – of Jupiter system. Credit: NASA, ESA, CSA, Jupiter ERS Team; image processing Ricardo Hueso (UPV/EHU) & Judy Schmidt.

Citizen scientist Judy Schmidt

What do we see in Webb's latest image of the ice giant Neptune? Webb captured seven of Neptune's 14 known moons: Galatea, Naiad, Thalassa, Despina, Proteus, Larissa, and Triton.

Credits: NASA, ESA, CSA, STScI

A SELECTION OF PHOTOS FROM THE JWST : THE DISTANT COSMOS

Four galaxies from the SMACS 0723 field (4.6bn Light yrs), as seen by the Hubble Space Telescope (left) and the James Webb Space Telescope (right). Each one displays features that were undetected with Hubble, but can easily be seen with JWST. Credit: NASA/ESA/STScI.

GRAVITATIONAL WAVES

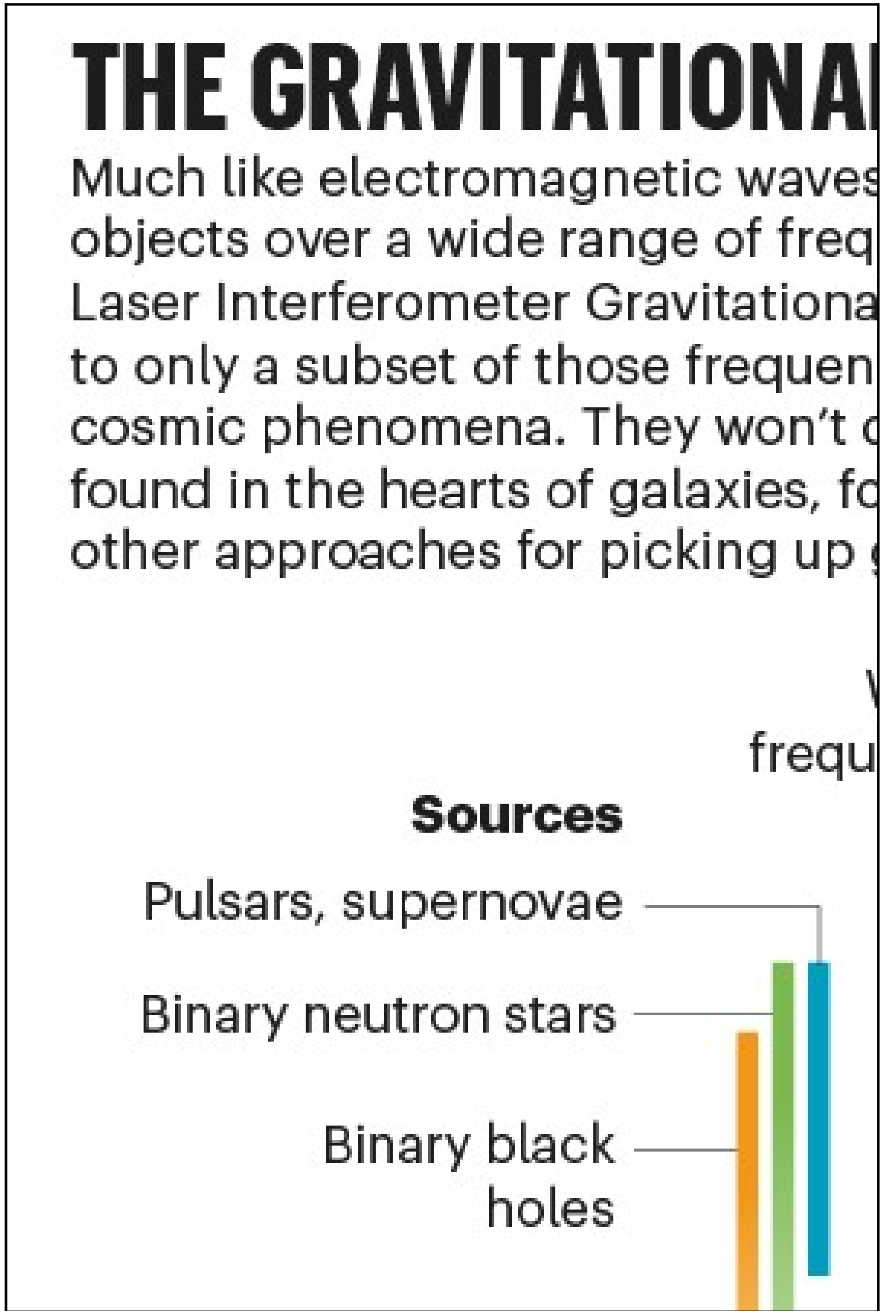
Carol & Kevin, from AAS, attended.
A couple of the "Experts" expressed an interest when asked if they would be willing to come to Abergavenny.

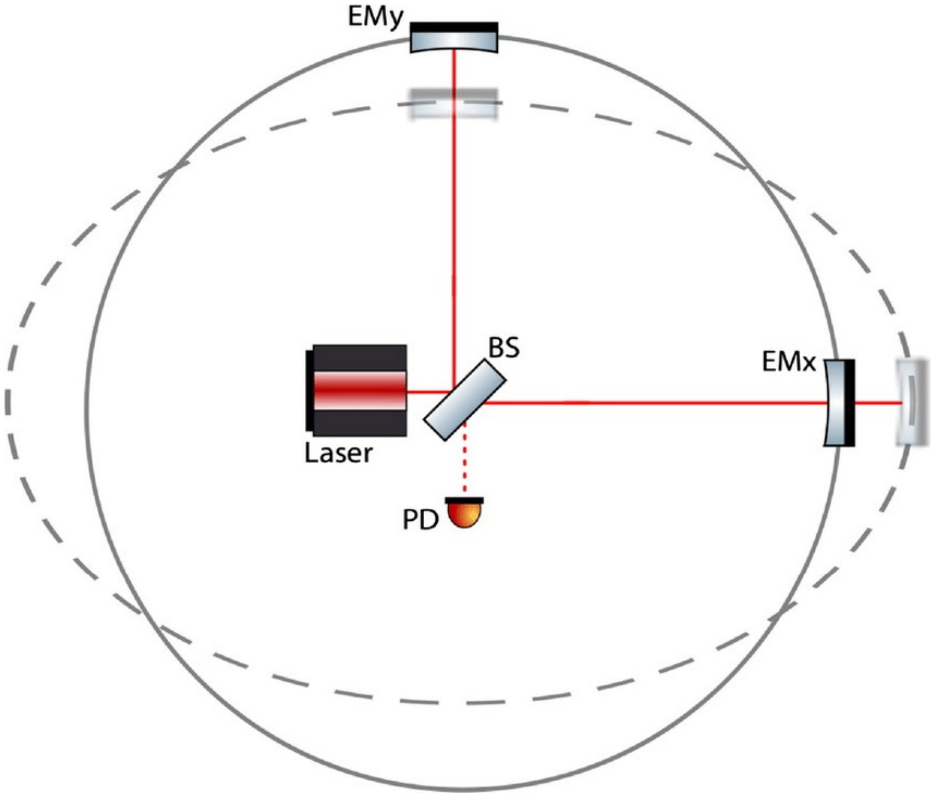
Ground based GW detectors
US, Italy & Japan
kms

Using Pulsars to detect GW
Thousands of Light years

Proposed space based detector (2030s)
millions of km

GRAVITATIONAL WAVES





A Michelson Interferometer acting as a gravitational wave detector.
When GW passes, one arm shortens while other lengthens, resulting in the interference pattern at the output port

Giles Hammond, Stefan Hild & Matthew Pitkin (2014) Advanced technologies for future ground-based, laser-interferometric gravitational wave detectors, Journal of Modern Optics, 61:sup1, S10-S45

GRAVITATIONAL WAVES

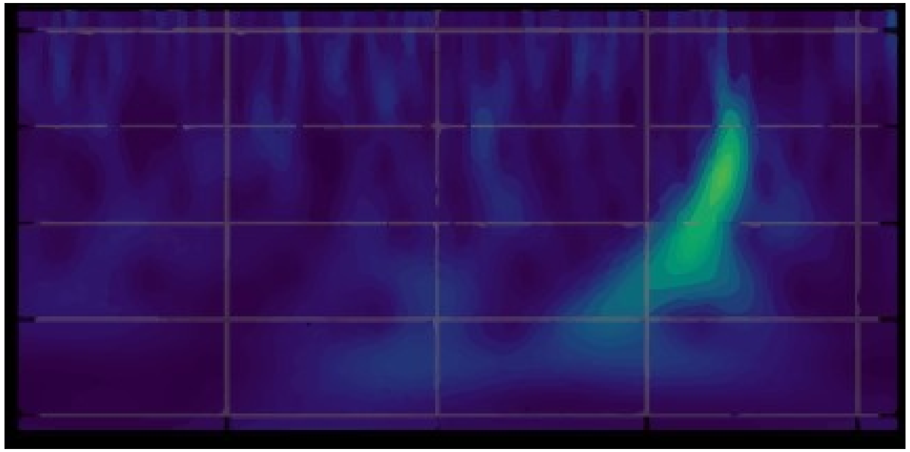
The first definite detection was on the 14th Sept., 2015 (GW150914), the merger of 2 black holes: 36 times and 31 times the mass of the sun.

It released around 3 times the mass of the sun in GW energy. (remember $E=mc^2$)

There have been 3 operational runs to date, O1/2/3

Sept 2015 - Jan 2016; Nov 2016 – Aug 2017; Apr 2019 – Mar 2020.

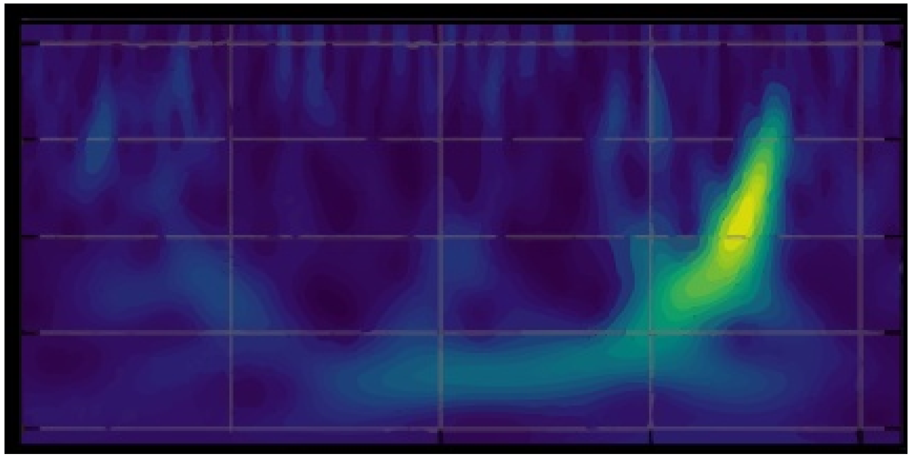
Some 90 accepted detections have been found to date
.



The next operational run, GWO4, is due to start next March.

Between runs maintenance and upgrades have been applied to the detectors.

The Pulsar Timing Project has also detected a possible GW event, we await the analysis of the data with interest.



THE SKY TONIGHT : 26TH SEPTEMBER, 21:21

THE SKY TONIGHT : 26TH SEPTEMBER, 21:21