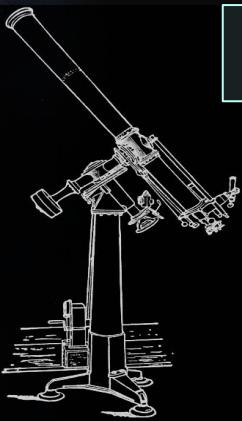


MIDTERM PROGRESS REPORT OPTICAL ODYSSEY

Peeking at the Beginning of the Universe



Mentors:
Shreya Rajak
Anushree Shukla
Princy Chauhan

ABOUT THE PROJECT

We aim to learn about history, working of telescopes, JWST and its components, about ISIM (Integrated Science Instrument Module), multiple-mirror optics and conditions in space by building a light collector similar to that of the primary mirror of the James Webb Space Telescope.



TIMELINE OF THE PROJECT



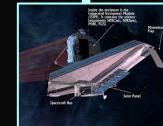
Week - 1

Evolution Of
Telescopes



Week - 3

JWST :-Structure and
its Components



Week - 2

- Types Of Telescopes
- Working Of Telescopes

Week - 4

- JWST - ISIM
- Astrophotography



WEEK -1

HISTORY AND WORKING OF TELESCOPES



HISTORY OF TELESCOPES



Lippershey's
Telescope



Galileo's telescope

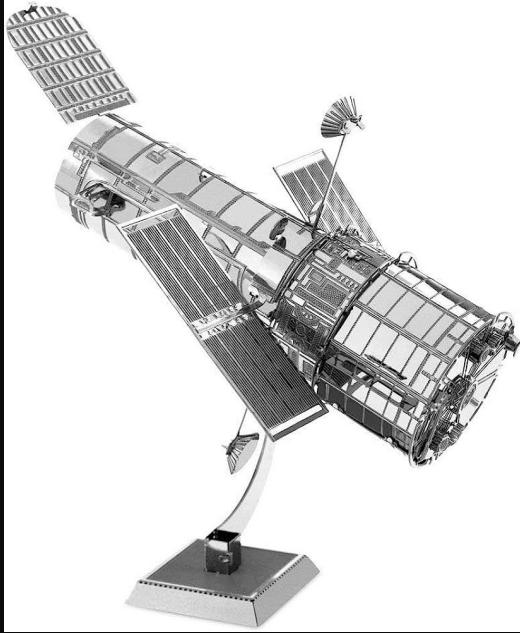


Newtonian
telescope

HISTORY OF TELESCOPES



Radio telescope



Hubble Telescope

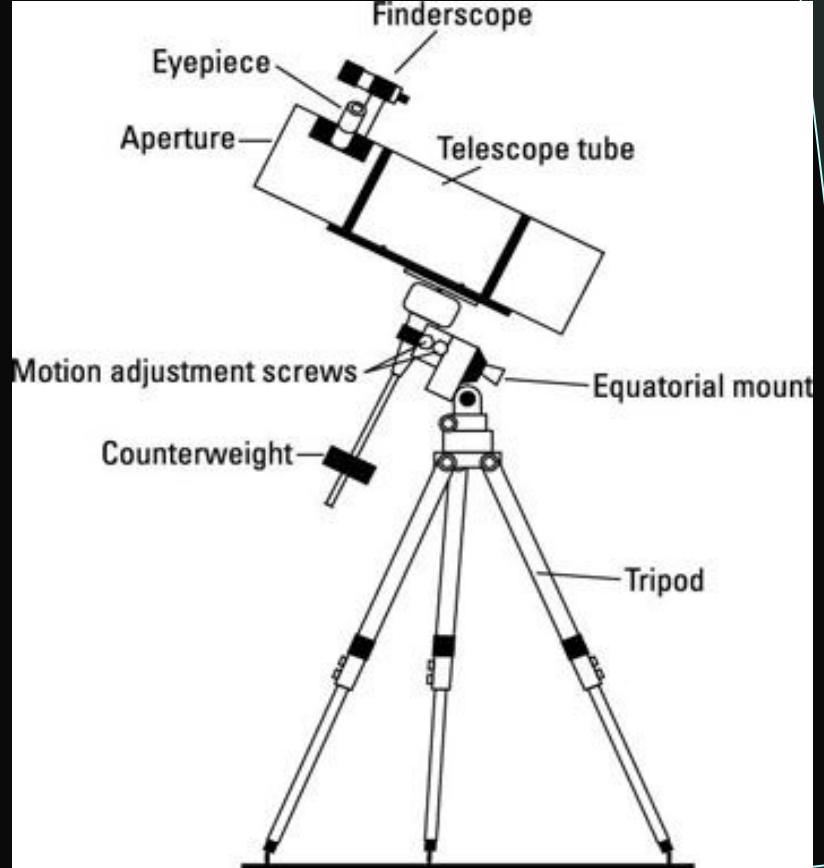


James Webb Space
Telescope

TELESCOPES: WINDOW TO THE STARS

- An optical instrument used to study and observe the cosmos
- Collects light emitted by the distant astronomical objects
- Focuses the collected light into one point or image

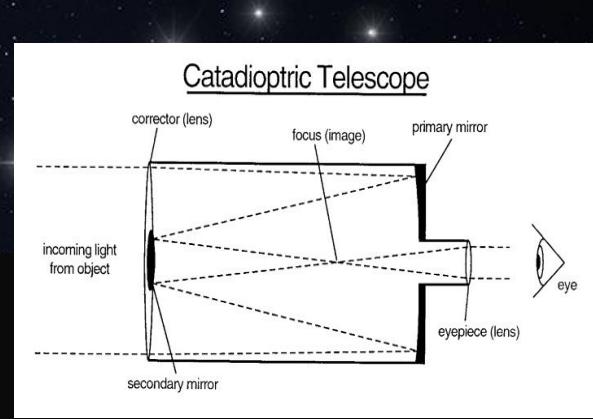
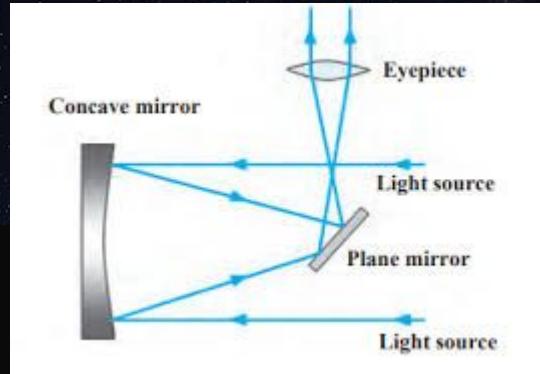
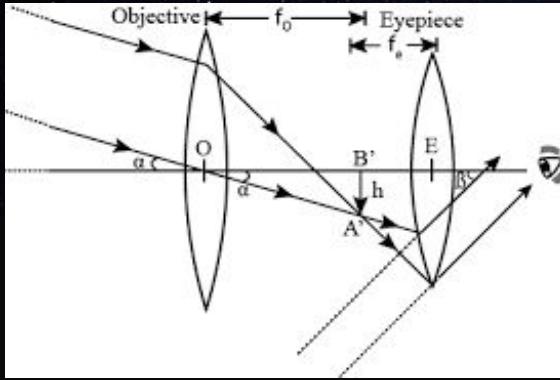
WE ALSO LEARNT ABOUT THE COMPONENTS OF TELESCOPE





WEEK -2

TYPES OF TELESCOPES



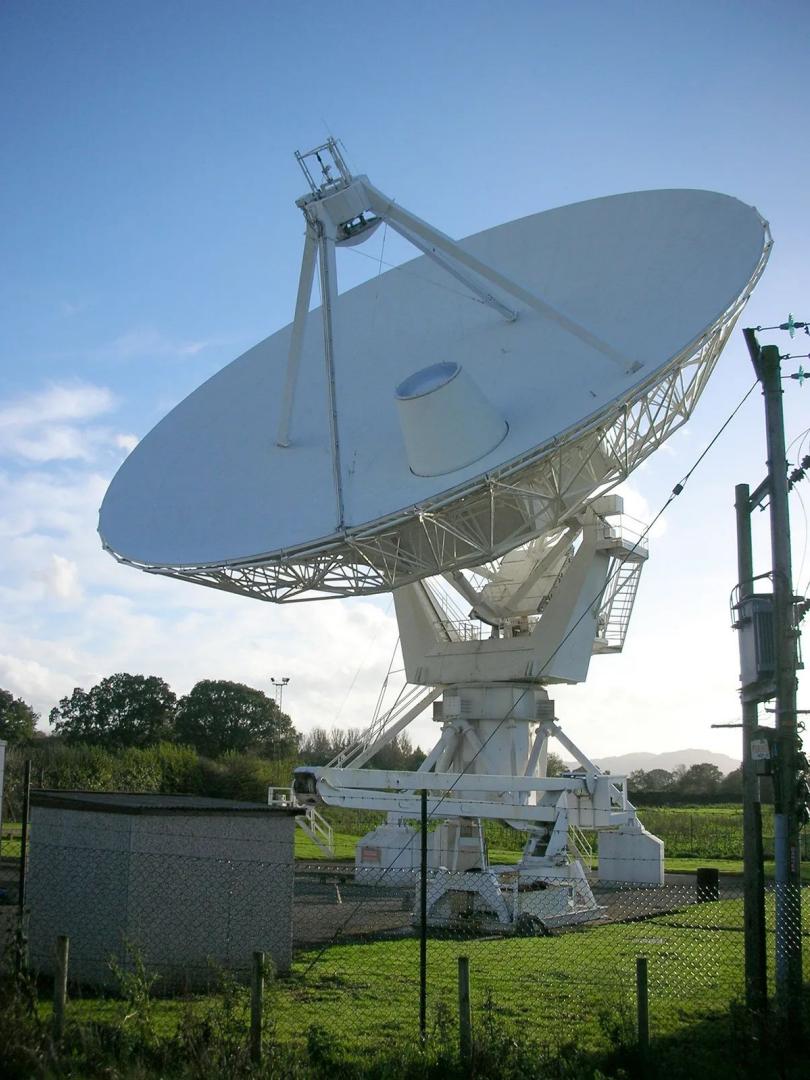
**Refracting
Telescope**

**Reflecting
Telescope**

**Catadioptric
Telescope**

RADIO INTERFEROMETRY

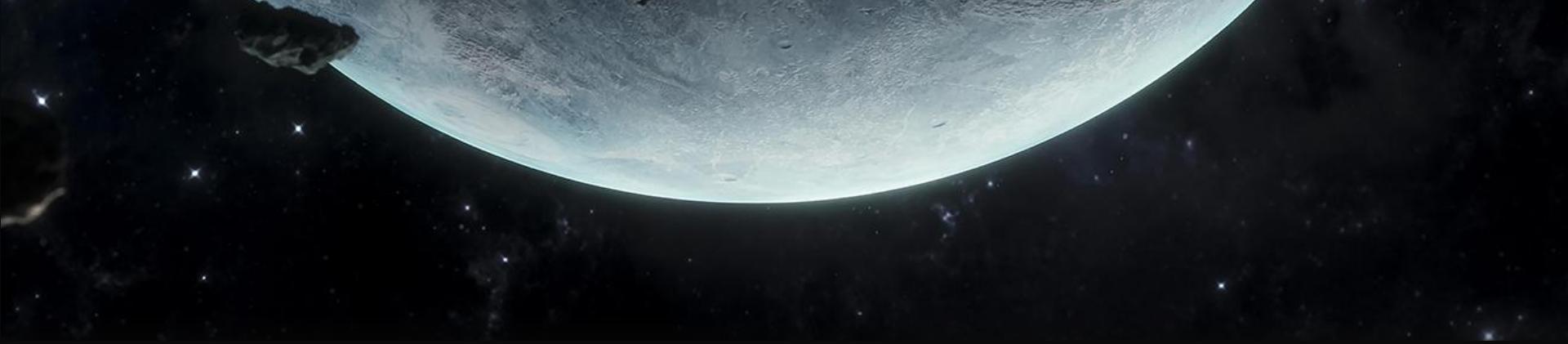
- It is a technique which combines signals from multiple different radio telescopes arranged in an order
- By correlating these signals we can observe and study distant astronomical objects like pulsars,quasars ,etc.



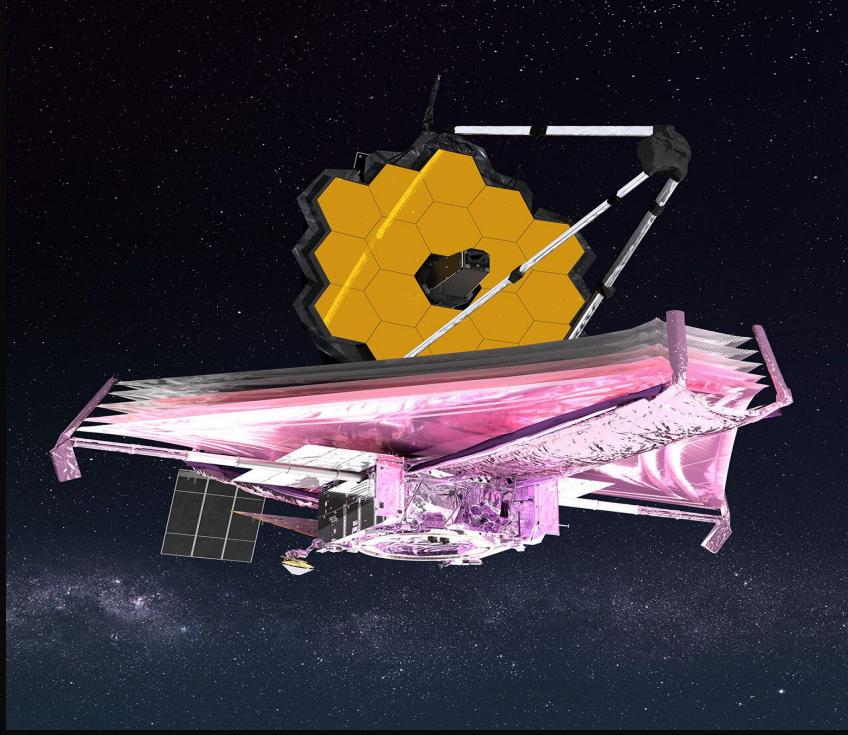
ASSIGNMENT : 1

With the help of this assignment we learnt the following things:-

- Resolving power of telescope.
- Resolution of telescope.
- How to derive the magnification of refracting telescope .
- How to solve the problems based on the working of cassegrain telescope.



WEEK -3

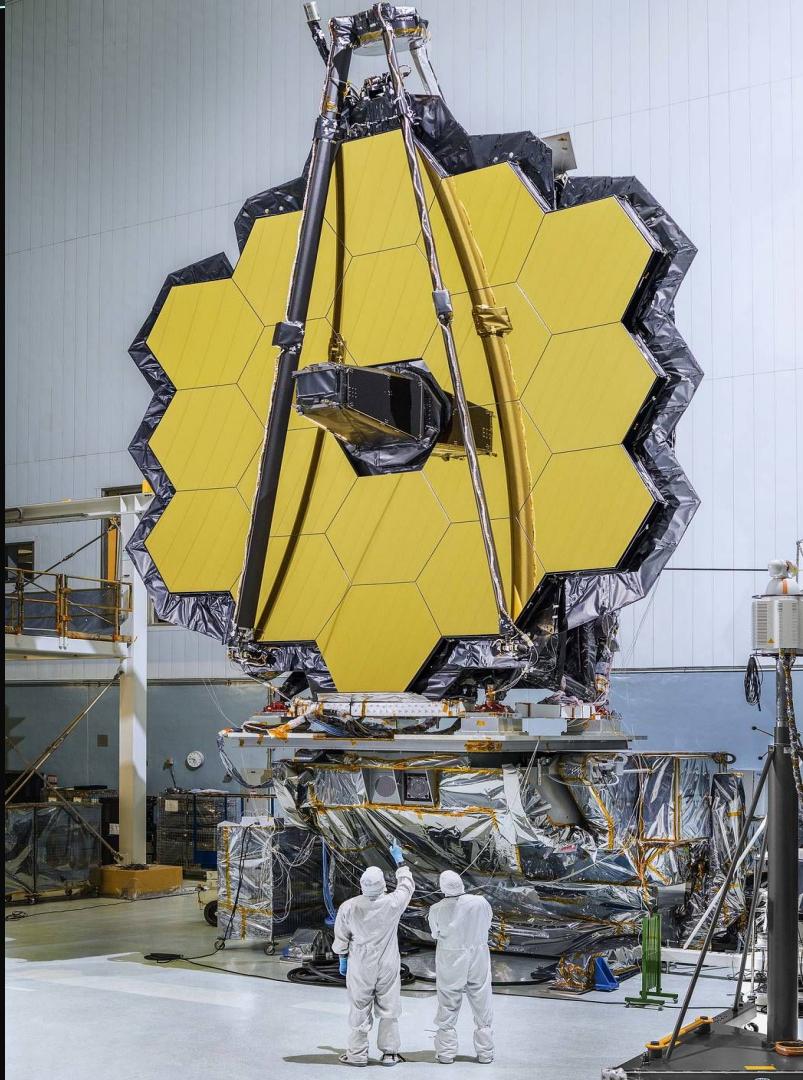


JAMES WEBB SPACE TELESCOPE

-THE NEXT GENERATION OF HUBBLE-

INTRODUCTION

The JAMES WEBB SPACE TELESCOPE is the largest and most powerful space telescope to date. The telescope has over 1200 skilled scientists and engineers from 14 countries building it and it took more than two decades and \$10billion to build.



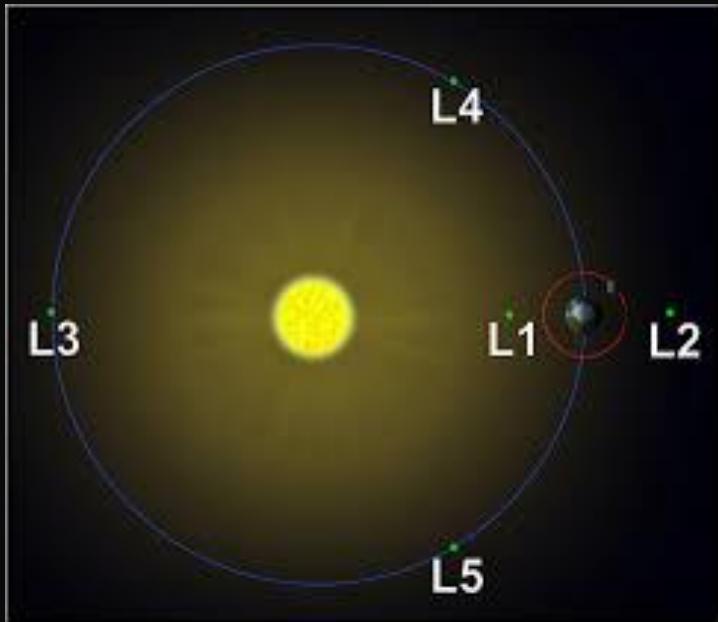
LAUNCH

1. NASA'S infrared space observatory,
launched on Dec 25,2021, from ESA 's
launch site at Kourou in French, Guiana
,at 7:20am EST aboard an Arianespace
Ariane 5 rockets.



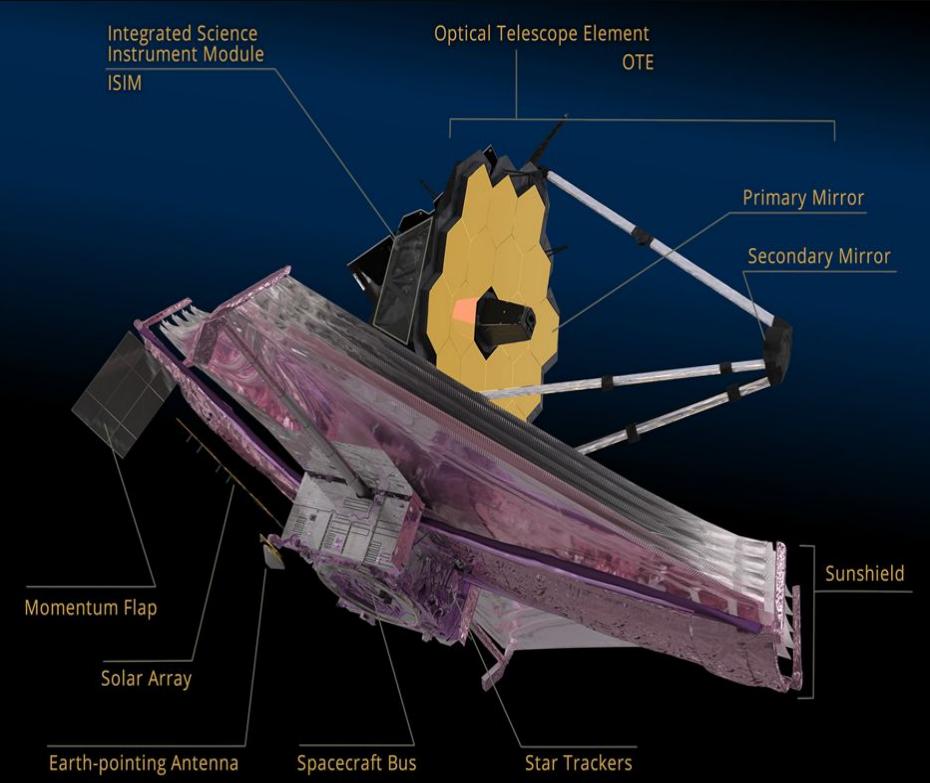
2. JWST Is placed 1.5 million KM away from Earth at second Lagrange point. It is done because

- Away from radiation of earth and moon
- Infrared Telescope
- Lesser Solar Radiation



PARTS OF JWST

- MIRRORS
- SUNSHIELD
- ACOUSTIC CRYOCOOLER
- THRUSTERS





WEEK -4

INTRODUCTION TO ISIM JWST



The Integrated Science Instrument Module (ISIM) of the James Webb Space Telescope (JWST) is a critical component that houses four scientific instruments. These instruments work together to observe the universe in a wide range of wavelengths, from visible light to mid-infrared.





TYPES OF ISIM INSTRUMENTS



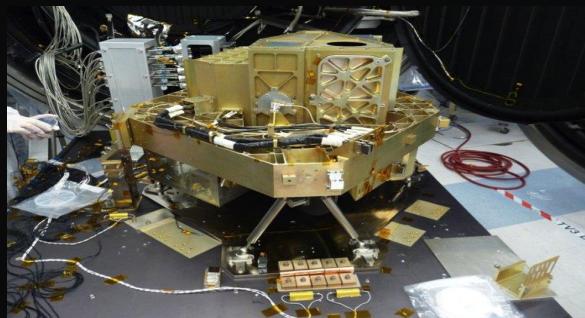
NIRCAM INSTRUMENT



MIRI INSTRUMENT



NIRSPEC INSTRUMENT

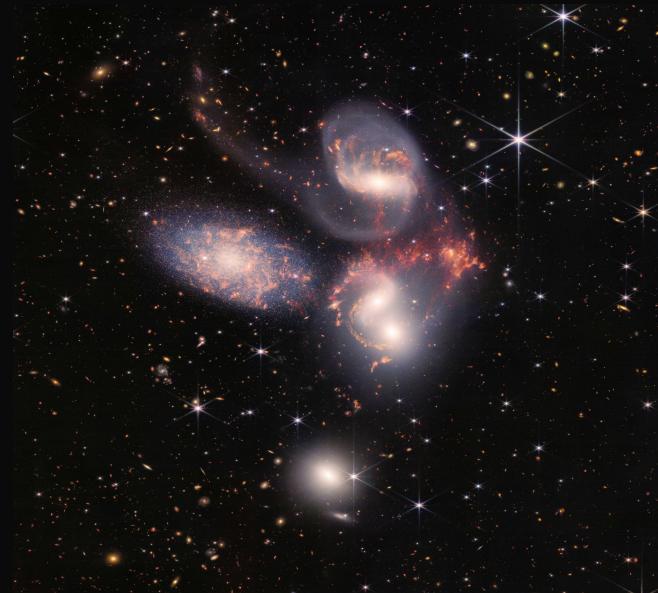


FGS/NIRISS INSTRUMENT

ASSIGNMENT 2

- In assignment 2 we learnt about the one of the first images taken by JWST.
- We also learnt to make a document using latex.
- We were divided into three groups for this assignment, and each group was given the task of researching one image.
- We studied about Stephan's Quintet , Carina Nebula and SMACS 0723.
- Stephan's Quintet is a visual grouping of five galaxies.
- Carina Nebula is a large , complex area of bright and dark nebulosity in the constellation Carina .
- SMACS 0723 is a galaxy cluster , about 4 billion light years away from Earth within the southern constellation of volans.

IMAGES TAKEN BY JWST



Stephan's Quintet



Carina Nebula



SMACS 0723

THANKS!!