



**SPACE™**  
EMPOWERING LIFE THROUGH SCIENCE

# VOYAGER

**A Foundation Course in Astronomy**

 <https://learn.space-india.com/courses/voyager>

## **About Us**

SPACE India is the largest non-government science education and popularization organization in India. We have been working in the Education sector for the past 20 years, serving various esteemed institutions PAN India with our innovative products and services in the field of Astronomy, space science education, and astro-tourism. The main aim and objective of this organization are derived from the Article 51a (H) of Constitution of India, which states

*“To develop the scientific temper, humanism and the spirit of inquiry and reform”*

Committed to our motto of empowering life through science, we are happy to provide you a foundation course in astronomy. This course is a perfect way to start your journey in the field of Astronomy at your own comfortable pace.

**“The nitrogen in our DNA, the calcium in our teeth, the iron in our blood, the carbon in our apple pies was made in the interiors of collapsing stars. We are made of star stuff.”**

**~ Carl Sagan**



# **VOYAGER**

What is our place in the universe? A question that has perplexed mankind since time immemorial and one that still isn't completely solved, owing to the vastness and complexity of it.

This course is designed to get you started on the path to answer this question by arming you with the basic skills and knowledge related to astronomy. It's a wild ride from the humble origins of astronomy from the days of yore (think ancient Mesopotamia and Egypt) to the discovery of quasars, pulsars, dark matter, and dark energy.

Hop on board to find easily digestible, concentrated doses of universe on the go, which make the best use of the time being invested and also serve to impart skills that not only help in gaining a foothold in the field of astronomy and space science but also in inculcating scientific temperament. Prepare to see theoretical concepts leap out from the books and documents in the form of practical demonstrations.



## Salient Features

- Certificate course
- Voyager's Backpack\*
- Learn at your own pace
- Attractive payment options
- Demo and hands on activities
- Exclusive webinars every month\*
- Quiz and assignments based on each topic\*
- Perfect course of Astronomy for beginners
- 30+ Hours of interactive content
- Virtual observation nights and meetups
- 26 Sessions covering all the major topics of Astronomy

- Exclusive discounts on SPACE Astronomy tools, merchandise, and future courses
- Chance to be a part of Astronomy Expeditions and travel all over the world
- Be a part of a global community of astronomers
- Exclusive entry in national & international level competitions and projects
- Certificates from international and national agencies for events and projects

\*only available with Voyager (Premium)

## Learning Outcomes

- Understanding the evolution of the universe and the solar system
- Understanding the history and impact of Astronomy on human civilization
- Importance, history, and achievements of human endeavors towards understanding the universe
- Familiarization with all the major celestial objects
- An overview of celestial phenomena such as the expansion of the universe and cosmic background radiation along with major celestial objects (comets, asteroids, planets, stars, galaxies, star clusters, quasars etc.)
- Get acquainted with all the major and minor objects of the solar system such as The Sun, The Moon, planets, comets, asteroids etc.
- Learn about major space missions and their impact
- Master the techniques to use telescopes and binoculars to observe celestial objects in their true grandeur
- Smartphone Astronomy
- Understand how to traverse the night sky
- Become a stellar mathematician and calculate the diameter of the Earth and other celestial objects
- Peer into the intricacies of motion of the Earth, planets, and the Sun. Learn the science behind orbits, axis, rotation, gravity, light, eclipses, and space
- Use your knowledge to take amazing photographs of the cosmos (using relatively simple equipments) and process them to create visually stunning masterpieces
- Get certified as an amateur astronomer and start your career in the field of Astronomy

## Voyager's Backpack (With Voyager Premium Only)



Voyager T-shirt



Voyager Cap



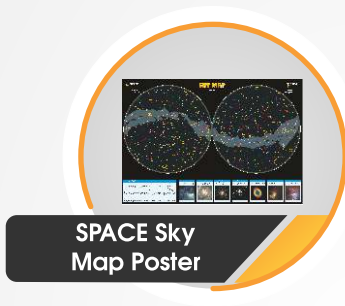
Voyager Badge



Voyager Stickers



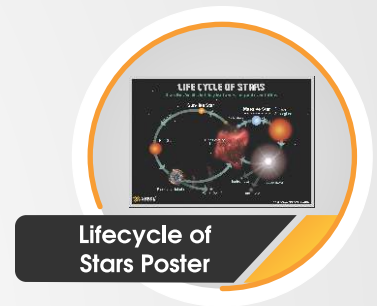
SPACE Milky Way Poster



SPACE Sky Map Poster



Moon Poster



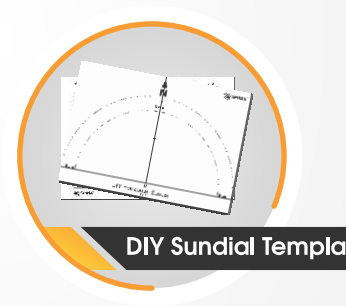
Lifecycle of Stars Poster



SPACE Latitude Finder



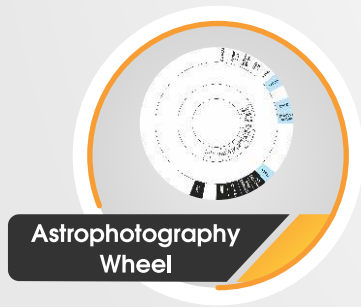
Planisphere



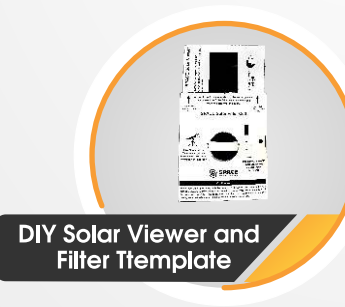
DIY Sundial Template



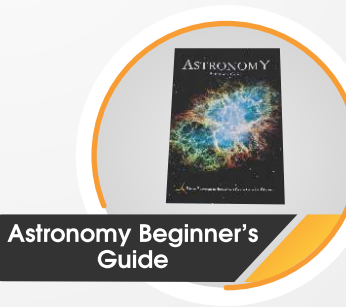
Messier Object Book



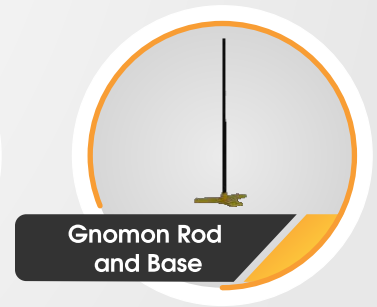
Astrophotography Wheel



DIY Solar Viewer and Filter Template



Astronomy Beginner's Guide



Gnomon Rod and Base



Voyager's Backpack



## Pre-requisite

*Curiosity to learn about the secrets of the Universe*

## Events

- All India Asteroid Search Campaign
- Sally Ride EarthKAM
- Project Paridhi
- Astro Podcast Competition
- Global Astronomy Month
- World Space Week

- Debate Competition
- Astrophotography Competition
- Heliodysey
- Exoplanet Hunting
- Virtual telescope and many more

## Subscription Plans

Features	Voyager (Basic)	Voyager (Premium)
26 Sessions	✓	✓
30+ Hours of Video content	✓	✓
Certification	✓	✓
Demos and Hands on Activities	✓	✓
Member Discounts	✓	✓
Events and Competitions	✓	✓
Virtual Observation Nights and Meetups	✓	✓
Course Access for 06 Months	✓	✓
Quizzes	✗	✓
Assignments	✗	✓
Doubt Clearing Sessions	✗	✓
Voyager's Backpack	✗	✓
Exclusive Webinars	✗	✓

**For further enquiry and to enroll, contact on**

 **9599811027**

1.

## Astronomy: Mother of all Sciences

The name says it all. If we trace back human evolution, we will find that Astronomy played a key role in igniting human curiosity. The quest began when our ancestors looked up. In this session, we will see how astronomy evolved over the years.



2.

## Astronomy and Space Science: Carrier of Human Ambition

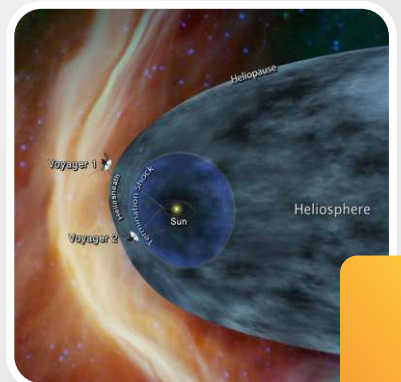


One can co-relate the evolution of Human civilization with the advancement in the field of astronomy. Astronomy has in fact helped us grow. In this session, we understand how astronomy has shaped us and how our life is dependent on astronomy even if we do not realize it.

3.

## Journey on the Beam of Light: Heliopause

The universe is so huge that to experience it all one needs to travel with the speed of imagination. We will go on a journey of the universe visiting various members of the solar system and learn about them. Since, the distance is so large that we can take up this journey only if we travel with the speed of light.



4.

## Journey on the Beam of Light: Infinity and Beyond

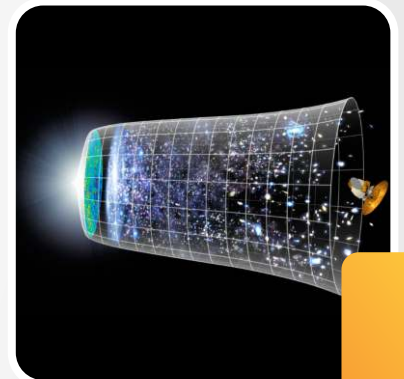


After witnessing the grandeur of the solar system, it is time to dive in the depths of deep space. We take our journey forward and visit neighboring Stars, Galaxies, Nebulae, Star clusters, Galaxy clusters, Black Hole, Quasar, Radio galaxy, Blazar, and end our journey at the point of Big Bang!

5.

## Evolution of Cosmos

A branch of science: Cosmology is dedicated to study the beginning, evolution, and possible end of the universe. In this session, we take a leaf out of the cosmology to understand birth of the universe, birth of the solar system, evolution of the solar system and the universe, and possible end of the universe in the future. We also take a look the possibility of multiverse.



6.

## Motions of the Earth



Before we jump in to learn about various concepts of astronomy in detail, let us first understand various motions of the Earth and their impact on our daily life. These motions are: Rotation, Revolution, and Precession.



7.

## Grids on the Earth

If you need to navigate to any location on the Earth all you need is the coordinates of that location. We have made an imaginary grid on the Earth having two coordinates: Latitude and Longitude. This grid has made the navigation a lot easier. In this session, we will understand the need of this grid and the concept behind it. We will also understand the importance of various latitudes.



8.

## The Moon



The Moon, also known as Luna, is the closest celestial neighbor, the only natural satellite of the Earth. It has always been a matter of curiosity for people from all walks of life and different age groups. There are a lot of mysteries associated with the Moon. In this session, we try to unravel a lot of these mysteries and learn about this celestial beauty.

9.

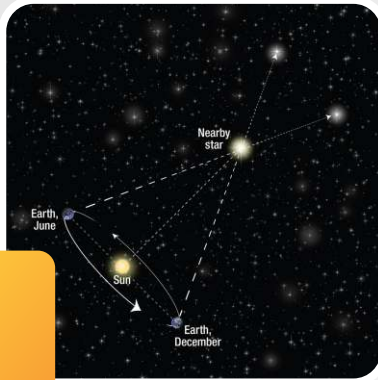
## Eclipses – Game of Shadows

Eclipse is one of the most amazing celestial wonders that one can witness. Along with being an amazing sight, it also presents an opportunity to study the universe in a very different perspective. In this session, we will learn about various types of eclipses, the science behind them, various myths associated, the science that one can perform during an eclipse, and how one can safely observe the eclipse and photograph it.



# 10.

## Celestial Geometries and Distances

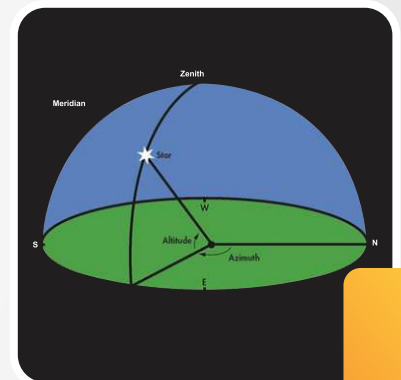


Other than the Eclipses, there are lot of other phenomenon which occur depending on the geometries of various solar system objects and other celestial objects. These include: Conjunction, Opposition, Occultation etc. In this session, we understand the science and importance of these celestial phenomenon. Along with this we will also learn about various units of distances which are used to measure celestial distances.

# 11.

## Celestial Grid: Alt-Az Grid

Just like we need a grid to navigate on the Earth, we need grids in the sky to navigate in the sky. One of the grid systems is ALT-AZ systems. In this session, we learn about the movement of sky, the details of Alt-Az system, and how we can find out the coordinates of the celestial objects using this system.



# 12.

## Celestial Grid: RA-DEC Grid



Alt-Az system is easy to use but has its limitation. It can be used for a small area but not the whole Earth. We need a system that is universal in sense and in which the coordinates of the celestial objects remain unchanged irrespective of the observer's location. In this session, we understand the details of such a system- RA-DEC system.

13.

## Lifecycle of a Star

Just like humans take birth, grow up, grow old and then die, stars also follow this cycle of life and death. They are born out of a cloud of dust and gases, grow big, goes supernova, and then die in a ferocious explosion. In this session, we take a look at this to understand how do the stars evolve and follow this cycle of life.



14.

## Stellar Mathematics



We are often puzzled by questions like how do we know that the Sun can fit in 1300000 Earths inside it. How do the scientists calculate distances of celestial objects, their weight, and volume? In this session, we unravel these mysteries and learn the tricks of Stellar Mathematics.

15.

## Sun and its Features

The Sun is our nearest star and the most important reason for our survival. It is the source of light and heat for us and provides suitable environment for hosting the life. In this session, we go in detail to understand our nearest star. We will learn to safely observe and photograph the Sun.





**16.****Solar System Walk**

Most of the photographs of the solar system are technically incorrect representation of the solar system. In this session, we understand how those representations are wrong and how we can make scientifically correct model of the solar system. We will also make one such model using household materials. We will also understand the effect of each planet on other planets.

**17.****Space Rocks**

Other than planets, dwarf planets, and moons there are lot of space debris in the solar system in the form of rocks of different sizes and composition. In this session, we learn about these space rocks, their compositions, appearance, and the need to study about them. At the end of it we will also learn to make a model of comet.

**18.****Telescope: An Astronomer's Companion**

While observing the night sky you must have felt the need of a device that makes you see the objects up close and in greater details. Telescopes make that possible for us. That is why they can be called an astronomer's companion. In this session, we learn about the need, history, science, and classification of telescope along with some of the largest telescopes and observatories in the world.

19.

## Binocular Astronomy

For someone who is just starting in the field of observational astronomy, Binoculars are a great tool. They are easy to use and has wider field of view in comparison to a telescope. In this session, we understand the basics of binoculars, how to choose the right binoculars, and how to observe the night sky using it.



20.

## Celestial Safari



Often we face these questions: what is the name of the star or DSO that we are observing, what will be the phase of the Moon on a particular day, which all objects will be there in the sky on a particular night, how will the sky look like from a different locations on the Earth or solar system! There are very simple tools to answer these questions: Planisphere and Stellarium. In this session, we learn how to use Planisphere and Stellarium to plan and conduct our observation efficiently.

21.

## Evening Observation

What is the purpose of all the knowledge gathered if we can't utilize that practically? In this session we will understand how we can conduct an evening observation to observe the celestial wonders using telescopes and binoculars.



**22.****Time and Sundial**

Humans have been keeping their life organized by keeping a track of time. The time keeping is done with help of various clocks. One of them is sundial. A clock that uses the movement of the Sun and shadow cast by gnomon to keep a track of time. In this session, we will learn about history of time keeping, various clocks, the science of sundials, and how we can make our own sundial.

**23.****Shortest Shadow and Project Paridhi**

How much does it cost to measure the circumference of the Earth? You might think of a huge sum of money. Actually, it only costs less than 100 rupees and 30 minutes to find out the circumference of the Earth as well as cardinal directions. In this session, we understand how we can do that using a simple experiment.

**24.****Introduction to Astrophotography**

Astrophotography is an amazing technique to present the beauty of the universe to general public in an easy to understand manner. These can be used for science communication as well as making people aware about the impact of light pollution. In this session, we will understand the basics of photography and astrophotography. We will learn how we can use DSLR camera and mobile camera to capture the beauty of the night sky.



25.

## Practical Astrophotography

In this session, we will use the DSLR camera and mobile camera to capture the beauty of the night sky. We will also learn about various techniques of astrophotography, practically.



26.

## Image Processing

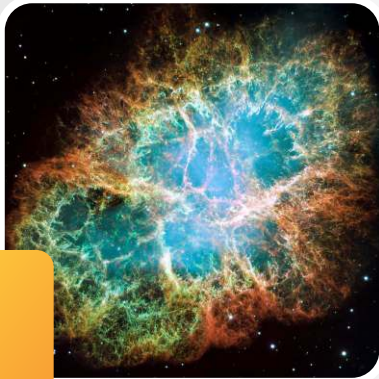


Image processing is a very important process of photography. It is essential to enhance the quality and detailing of the image. In astrophotography, it becomes even more critical as without processing you cannot bring out small details. In this session, we will learn about various techniques of image processing and the basics of image processing.

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