# A Career in Astronomy and Astrophysics

Since time immemorial the members of our species have looked up at the heavens and been left in wonder by the celestial objects that light up the sky. The development of science has only amplified the wonder. We now wonder about how these objects came into being and the universe in general. It is the pursuit of the challenge of answering this question and the immense satisfaction gained on finding the answer that drives people to seek a career in professional astronomy and astrophysics.

## What do professional astronomers do?

- **Theoretical Astronomy or Astrophysics:** Understanding the laws of physics behind the working of the celestial objects as well as the universe – the nature, composition, origin and evolution. Conducting simulations to test theories and searching for patterns in existing laws to fine tune our understanding of the laws of nature.

- **Observational Astronomy:** Understanding the motion of celestial bodies in the sky and using this knowledge to plan your observations of the skies, understanding the data coming from telescopes, analysis and reduction of the data, interpretation of the same.

- **Instrumentation Design and Development:** Make use of cutting edge technology to create devices and sensors that astronomers need day in and day out to gather information from the skies. This field includes development of detectors, design of telescopes, design of their controlling motors, software design for controlling the same, etc.

You must note that these divisions are only formal. As a true professional astronomer, you will find yourself doing more than one of the above mentioned activities.

## How do I become a professional astronomer?

We highlight a typical career path to be followed in order to become a professional astronomer below.

A solid foundation in Physics and Mathematics is a must. There is a need to understand the subjects by reading and discussing beyond the curriculum.

**10th Class**

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**12th Class (Physics and Mathematics)**

Right from Schooling to Master's it is advisable to participate in Astronomy Clubs and public outreach programs organized by various institutes and planetariums.

**A Bachelor's Degree in Physics and Mathematics**

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Using Summer vacations of both Bachelor's and Master's degree education to do a hands-on project in Astronomy or Astrophysics will give you a head start. Keep your eyes open for such project offers!

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**A Master's Degree in Physics**

A common selection criterion for PhD is your firm grip over basic Physics and Mathematics. You would usually not be required to know astronomy since training is offered in the same. The best way to prepare for these exams is to understand the subjects right from the beginning!

**B.E. / B.Tech. / M.E. /M.Tech**

As far as being able to do PhD after B.E. or B.Tech., the regulations for different universities are different. Some universities simply allow this, some insist on student doing a special project in lieu of M.Sc and some can insist on the student being an M.Sc. Please note that additional effort may be required to grasp fundamentals of Physics which are not taught in the greatest detail in engineering courses.

**A PhD from a relevant institute**

**Placement in a Planetarium**

**Post Doctoral Research**

**Placement in private firms (Hardware and Software, Design and Development)**

**Faculty Position in University (Research and Teaching)**

**National Institutes or Observatories**

For more information, please visit: http://www.iucaa.ernet.in/~scipop/beastronomer.html