



US-ELTP Career Profile

Trupti Ranka

Giant Magellan Telescope

Senior Control Systems Engineer



"I love the days when you finally get the result you have been working for and you can enjoy the satisfaction of your team's success."

The anticipation of seeing successful results after a long period of hard work and commitment is what motivates Trupti Ranka in her role as a control systems engineer. Trupti specializes in testing the hardware for the primary mirror, the first surface that collects incoming light, of the Giant Magellan Telescope. She runs simulations to understand the interaction between hardware for the primary mirror and its effect on astronomical image quality. The first two years of Trupti's work at the Giant Magellan Telescope focused on creating and analyzing these simulations. Now Trupti has transitioned to the testing phase, where she collaborates with many different teams to understand issues and works to debug the hardware to solve those issues. Part of this process includes considering previous testing results and determining which issues need to be addressed during the upcoming round of testing. With many other teams conducting their own tests during this time-restricted period, Trupti relies on effective communication and planning.

What do you enjoy most about your career?

Most days are relatively routine, and it takes a lot of work to finally get results from your hardware testing or simulation. I love the days when you finally get the result you have been working for and can enjoy the satisfaction of your team's success. This is the same as with writing documents that you have been working on for weeks and you finally see the end product. I love this fulfilling moment, especially when the work involves the success of other teams.

How did you become interested in science?

I have been interested in science for as long as I can remember. I grew up in Pune, India, located southeast of Mumbai, where there are two astronomical institutes with public outreach and education programs. In high school, I started to participate in their scientific observations of the sky and learned general techniques for thinking like an astronomer. I pursued a degree in instrumentation and control engineering for practical reasons even though it promised to be a long journey. When I finished my engineering degree, I had several job options, one of which was working for the Giant Meterwave Radio Telescope in India. I worked there for two years, applying some principles of control systems.

To further my education and to experience living abroad, I went to Case Western Reserve University in Ohio for my PhD in engineering. During my time in graduate school, I worked on control and modeling problems for the radio

Fun Facts



I like to explore different hobbies. For example, when I was in Ohio, I learned ice skating.



I like to go hiking and travel at least once a year.



I toured and hiked a glacier on a trip to Alaska and visited Denali National Park and Preserve.

telescope at Green Bank Observatory in West Virginia. To take advantage of other opportunities, I applied for and received an internship at the Large Binocular Telescope in Arizona. After graduating with my PhD, I applied for a position at the Giant Magellan Telescope, and at this time in my life, I had built up enough experience and background in telescope engineering to qualify for the position.

What were some challenges or opportunities that you faced?

With my background, I have the ability to work in many different industries from medicine to robotics, and anywhere in the world. Telescopes, however, is a very niche industry with few jobs for engineers, so I have been fortunate to land a position applying my skills in a field that I enjoy. If you come from any industry to work on telescopes, you realize the pace is very slow. It takes about 20 years to design something from beginning to end, whereas most engineers in other fields experience a quick turnaround and a sense of accomplishment in

what they have developed. Working on telescopes is one of the slowest engineering jobs, but you don't really feel this because there are so many tasks and a large amount of work with limited money – so it understandably takes 20 years to see your project through. It is also a benefit to work on a lot of interesting things in a rather relaxed environment.

What advice do you have for students?

I would advise students interested in pursuing a STEM career to get a broad and deep understanding of their subject quickly without having a sharp career goal in mind. Just enjoy the subject first and feed your passion. This will provide you with the direction you need to get a specific job or select a specific career path. Additionally, developing communication skills is very important regardless of what career path you choose. Even though my path has been very technical, I have to write a lot of documents and give a lot of presentations. Take a variety of opportunities to practice and apply these communication skills.

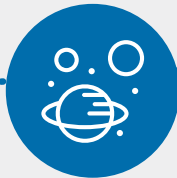
Trupti's Pathway to Senior Control Systems Engineer



Grew up in Pune, India



Participated in astronomy outreach programs



In high school, she learned how to make scientific observations of the sky



Studied engineering at the College of Engineering in Pune



Worked for the Giant Meterwave Radio Telescope in India



Now she is senior control systems engineer for GMT



Interned at the Large Binocular Telescope in Arizona



Earned her PhD in Engineering from Case Western Reserve University