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THE ASTEROID HUNTER

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At 16, he is the youngest Indian astronomer to have discovered asteroids over the last two years. Aryan Mishra made headlines when he won the All India Asteroid Search Campaign and he now aspires to become the first youngster to land on Mars. He talks to Sangeeta Yadav about his journey – from convincing his family to allow him to pursue his unconventional dream, to meeting astronauts like Rakesh Sharma and Sunita Williams and facing life threatening challenges

Astronomy is his favourite subject and at 11, telescope became his best friend. Meet 16-year-old Delhi-based astronomer Aryan Mishra whose spatial curiosity led him to discover an unknown asteroid in a nationwide asteroid search campaign. Since then, he has found nearly 300 Near Earth Objects in space.

“Asteroids are basically debris orbiting the Sun. The one which I’ve discovered is a Main Belt Asteroid which my classmate Keerti Vardhan Kukreti and I found in 2014 between Mars and Jupiter. We were nominated from our school for a nationwide campaign

for searching asteroids, the All India Asteroid Search Campaign. The International Astronomical Search Collaboration (IASC) provides us with the images taken from 34 to 53-inch diameter telescopes at the Astronomical Research Institute (ARI) Observatory in the US. They sent it us through the astrometrica software and we make reports on the basis of various factors like whether the object is moving in straight line, or at a constant speed, etc,” Mishra says, adding that it was through rigorous study and research that these discoveries were made.

Mishra, who is currently in Class XI pursuing Science from Chinmaya Vidyalaya, Vasant Vihar, strongly believes that life does exist on other planets. “There are many planets which share similar traits as Earth. Once Stephen Hawking said: ‘Send a spacecraft to Europa – one of the moons of Jupiter, and dig 25 km. You will find water.’ The NASA sent the spacecraft Juno and it X-rayed the surface and found the area full of ice. Mars has North and the South Pole and, thus, it is said that these regions will have signs of ice and water. Saturn, for instance, has Titan as its moon and it rains methane. Another planet, Lucy discovered a few years back, is made up entirely of diamonds. Life on another planet is not impossible but difficult to find,” Mishra tells you.

His aim is to visit NASA this year but his next big dream is to be the first person to land on Mars. “Instead of unnecessarily overcrowding Earth, I’m on a quest to find habitat on some other planet. NASA is planning to send humans to space in the 2030s. SpaceX, a private company of Tesla Motors, is preparing to send humans to Mars in 2024. Blue Origin, an organisation by Jeff Bezos who is also the founder of Amazon, is also planning to send humans to Mars,” he tells you.

Mars is a death zone where gravity can break bones or make you brain dead with low gravity. “It takes eight months to travel from Earth to Mars. For those many months, you will be on the spacecraft. When you come to the planet, the gravity is so low that if you will put your feet down, you can break your leg. Your brain can get damaged and you can even go blind because the fluid gets jammed and doesn’t reach your brain. A lot of research is being done on this. It’s not easy but not impossible. Humanity exists and there is life in space,” Mishra asserts. Countries leading in the Mars research are the US and Europe.

Unlike NASA, ISRO doesn’t have a space programme for sending out humans to space. Thus, Mishra aspires to work with NASA to travel to other planets. “If ISRO starts running a space programme, I will definitely work with them as they are the best agency and have a great talent pool. The ISRO sent a spacecraft to Mars in one shot which even the most powerful countries can’t do. What we need is a higher budget. Three years back, they

used to provide Rs1,000 crore for a space project. Last year, they increased the budget from Rs3,000 to Rs5,000 crore and ISRO managed to make Rs1,300 crore by launching satellites. America takes Rs20 crore to launch spacecraft whereas India takes only around Rs7crore,” Mishra tells you.

The ISRO is not just sending satellites to space but also helping various Ministries in many ways. “The Government uses ISRO in 190 places. For the surgical strike that took place last year, the thank you note should go to ISRO’s Cartosat — a 2C satellite launched in June last year. It helped us get live satellite images of terrorist bases in PoK,” Mishra says. He also tells you that ISRO will be making history this year by launching 103 satellites — three Indian and 100 foreign — at one go in a single rocket Polar Satellite Launch Vehicle C37 (PSLV-C37) in February.

Today Mishra is known as a genius who shares his success story at TEDx talks but his journey has been tough. Three years back, while peers were into playing games, listening to trance music and watching thrillers and webisodes, this teen travelled to Rajasthan, Uttarakhand and Uttar Pradesh in search of a clear night sky for his research in constellation and space activities.

“I gave up on a lot of things to pursue Astronomy, like playing with my peer group and socialising. I always say: ‘Your dreams are your wings that help you to fly, go face the world and reach for the sky’. That is what I did. To begin with, I wanted to be a train engine driver because I love trains. But then the passion for astronomy struck me when I read about the Solar System in Class VI. When I used to look up into the night sky, I wondered what lay beyond. This is one of the questions that made me go on this quest and my desire to become an astronaut came true at a very early age,” Mishra says.

But to convince his parents to let him pursue his passion was an uphill task as they had some other career plans. “It was very difficult to convince my parents as they don’t come from a Science background. My mother never went to school and my father studied only till High School. They wanted me to become an IAS officer or take up some Government job or go for an engineering degree. When I told them that my passion lies in astronomy and I want to be an astronaut, they didn’t allow me to pursue it. I fought with them and argued endlessly to convince them. When they would fall asleep, I would sneak out to study the constellations. They used to tell me that I was wasting my time looking at the night sky,” Mishra recalls.

For his father, as Astronomy was not a popular subject, to make a career in the field would be impossible. Though Mishra was saddened that he didn’t have any parental support or someone to guide him, he didn’t give up his dream. He is what he is today because of determination and belief in his dream.

Today, his parents feel proud that he followed his heart which resulted in ensuring that he realised his dream. In fact, his father came to know what Mishra had achieved for the first time at TEDx Delhi conference held last year.

As he didn’t have parental support, it took him a year to buy his first telescope from his savings. “Buying a telescope is very expensive depending on what size you want. My first telescope cost me Rs7,000. When I used to go for the tuitions, I used to take the bus to save money for the telescope, I used to walk 2 km every day and save Rs20-Rs40. I cut down on my canteen expenses. When I held the instrument for the first time and looked into space through it, I can’t describe how good I felt. But my second one cost me Rs38,000 and was bought by my parents,” Mishra tells you.

It was the astronomy club in his school that fueled his passion. “When I saw the breathtaking visuals of Saturn’s rings, I was hooked. We used to go to Sariska, Dehra Dun and other places in Uttar Pradesh where one has a clear sky,” he says adding that the school also supported him tremendously.

The root cause for people not considering astronomy as a career is that children are not encouraged to do so. “First, it’s difficult to change the mindset of the people who think that being an astronaut is not a suitable profession. When I give talks, many appear to just listen rather than show any kind of genuine interest. There are very few schools which have astronomy club and conduct activities. But there are organisations like The Science Popularization Association of Communicators and Educators (SPACE) in Delhi that help students in training them to search for asteroid and collaborating with other international organisations for search missions. I visited Satish Dhawan Space Centre last summer. I was disappointed that they didn’t have anything special except for the building, launching pads and a museum. Now, ISRO is giving chance to the students to make a satellite which they will launch. But that too is focusing only on college students. What we need are programmes and space gardens in schools to encourage students from a young age. I conduct talks through Google Hangout and Skype across the world to inspire the young minds about this amazing field,” Mishra urges.

Even though Mishra managed to convince his parents, life was not easy. He faced many challenges — from protecting his instrument to being almost attacked by a leopard and falling off a mountain. “The biggest challenge is to keep the equipment warm especially those which run on electric batteries, these are different from normal batteries. We have to go far from Delhi to get a clear night sky. To keep warm at night is another

challenge as the temperature dips to minus 10 degree Celsius. Once I was in Uttarakhand and I was standing on the road and looking at the sky. My driver asked me to come inside the car. The moment he started the car, a leopard crossed the spot where I was standing. A shiver ran down my spine. Those few seconds, when the driver asked me to come inside, saved my life. For the security purposes, I trained a dog to keep vigil. Many have died due to snake bites and leopard attacks,” Mishra tells you.

In another incident in Uttarakhand, Mishra fell off the mountain and was seriously injured. He was on a mountain top and looking down through his telescope when he slipped and rolled down 400 feet. He broke his leg and shoulder and had to be hospitalised. Another time, he left his telescope on a mountain to get a cup of tea only to find a snake wrapped around it and looking at its lenses.

But all this he tells you has been worth the problems and the challenges. In the four years since he began his journey in astronomy, Mishra has been fortunate enough to meet some renowned astronomers, astronauts, astrophotographers and organisation heads who gave him the right guidance and motivated him to keep his dream alive.

“It was a dream come true when I met Cosmonaut Rakesh Sharma, first Indian in Space and the hero of the Soviet Union. He told me about his journey in the space programme and how he made it big, how ISRO works and many other things. I met NASA astronaut, now the late Sunita Williams, and ISRO chairman AS Kiran Kumar too and talked to them about how we can get the space programme in India, especially to inspire students. I often Skype with astronaut Dr Shawna Pandya who is now training for space rides and will soon be in space, and NASA astronaut Nicole Stott who is the first astronaut to paint in space,” Mishra tells you.