

# ANOTHER FEATHER IN THE CAP

| STAR PEOPLE |

FAYEKA ZABEEN SIDDIQUA

This year we can proudly say that Bangladesh has reached the stars.

No, we are not reiterating any clichéd idiom; a young Bangladeshi astrophysicist has actually made it true for us. Don't believe us? You can check out NASA's website to learn more about the man who has brought us this great news.

A team led by 29 year old Rubab Khan, a Bangladeshi astrophysicist of Nasa Goddard Space Flight Centre, has made a significant contribution toward improving our understanding of how the most massive stars in the local universe live, age and die, while the broader role that these stellar behemoths play in the universe.

According to Khan, they have discovered five potential twins of "Eta Carinae", a supermassive star in other galaxies, using data from NASA's Spitzer and Hubble Space telescopes.

"In our galaxy, Eta Carinae contains one of the most massive stars which is equivalent to the mass of 100-150 suns," informs Khan via email.

"Eta Carinae had a "Giant Eruption" in the 1840's that made an enormous amount of material outburst that is about 20 times the mass of the Sun. This ejected material is now found in the form of an hourglass shaped veil of gas and dust around the star. Now we have discovered that Eta Carinae is no longer the only anomaly, rather there are five twins of the system in other galaxies."

Khan believes this discovery would help the world of astronomy solve a number of mysteries about massive stars. "Previously, there were no known analogs, making it impossible to determine if Eta Carinae's eruption was a one-off event triggered by some highly unusual local conditions, or if it were something that happens to all super-massive stars as they grow old," he says.

Rubab's stargazing adventure started long before he owned an actual telescope. He grew up listening to his mother's stories about how clear the night sky of Dhaka used to be during her childhood.

For Rubab, load-shedding was a blessing in disguise. Because, every time the power went out, he would inevitably be found on the rooftop gazing at the starry sky.

"Fortunately, I lived in the Dhaka University campus throughout my childhood, where watching the sky was easier than probably most other places in the city," he says.

Over time, he started reading as much as he could about astrophysics: be it an article by Dr. Abdullah Al Muti in the newspapers, or the few Bangla books on astronomy that were available in the market. M Zafar Iqbal, veteran science fiction writer, has been his biggest inspiration, says Khan.

"His science fictions and stories about his own life as a scientist inspired me to pursue astrophysics professionally," he says.

When he was in school he used to take part in workshops and seminars organized by the Bangladesh Astronomical Association. After finishing his Higher Secondary Certificate, he received a scholarship from Columbia University, which made everything that followed possible. Being a research university, Columbia University made Rubab engage in extensive research in the initial years of his stay there.

"Because of this, by the time I finished



Rubab Khan

PHOTO: STAR FILE

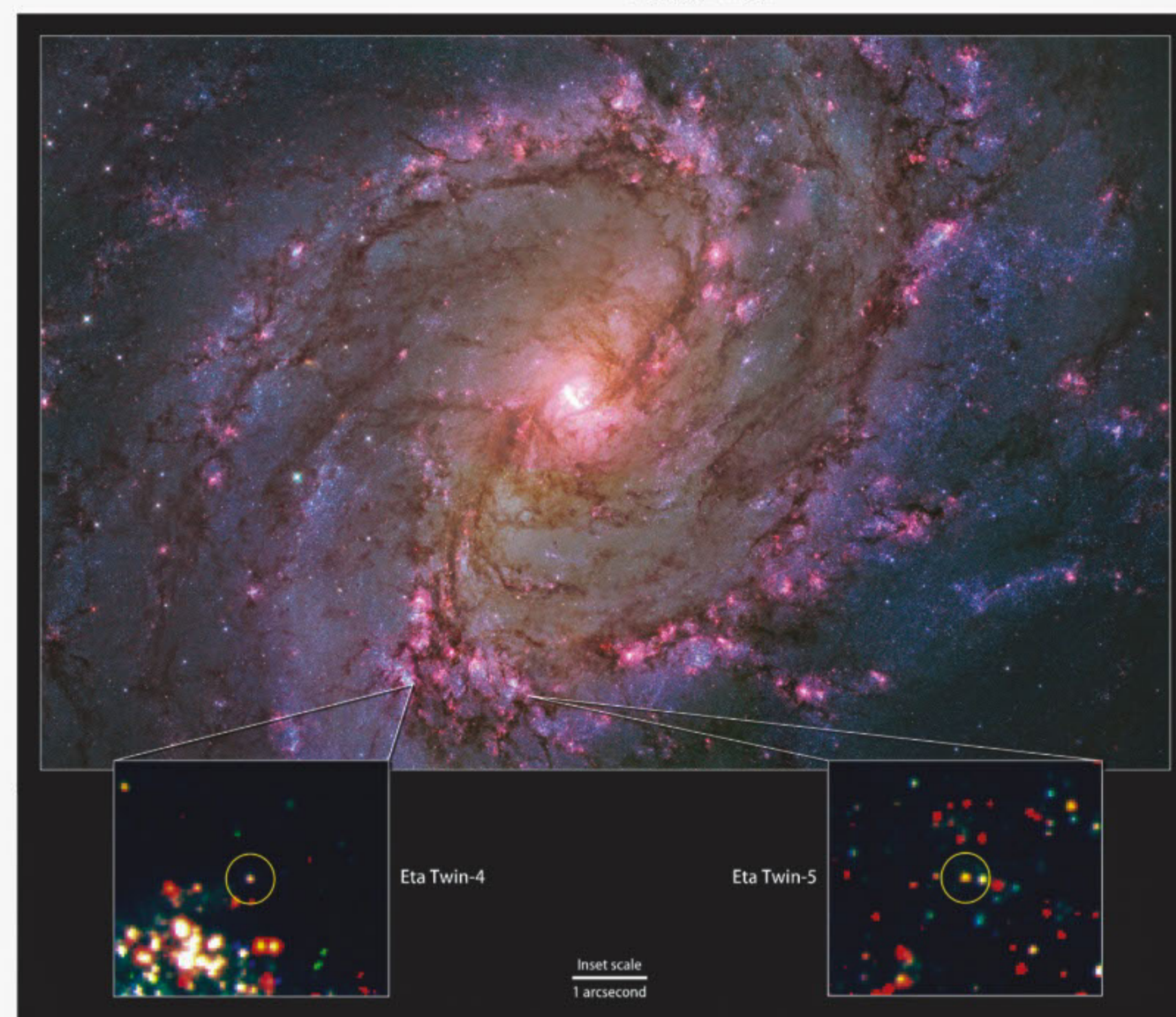


PHOTO: INTERNET

my undergraduate studies there, I was already working with a major research project called "LIGO" for four years, which aims to detect gravitational wave signals from astrophysical objects. This prepared me very well to pursue further research in graduate school at the Ohio

State University," he informs.

As soon as he reached Ohio State, he had to work on a wide range of projects in the first 2-3 years, before he decided to work on massive stars.

Of everything, why massive star geriatrics?

Khan always wanted to work on something where he could have the opportunity to make an original contribution that was not being pursued by anyone else.

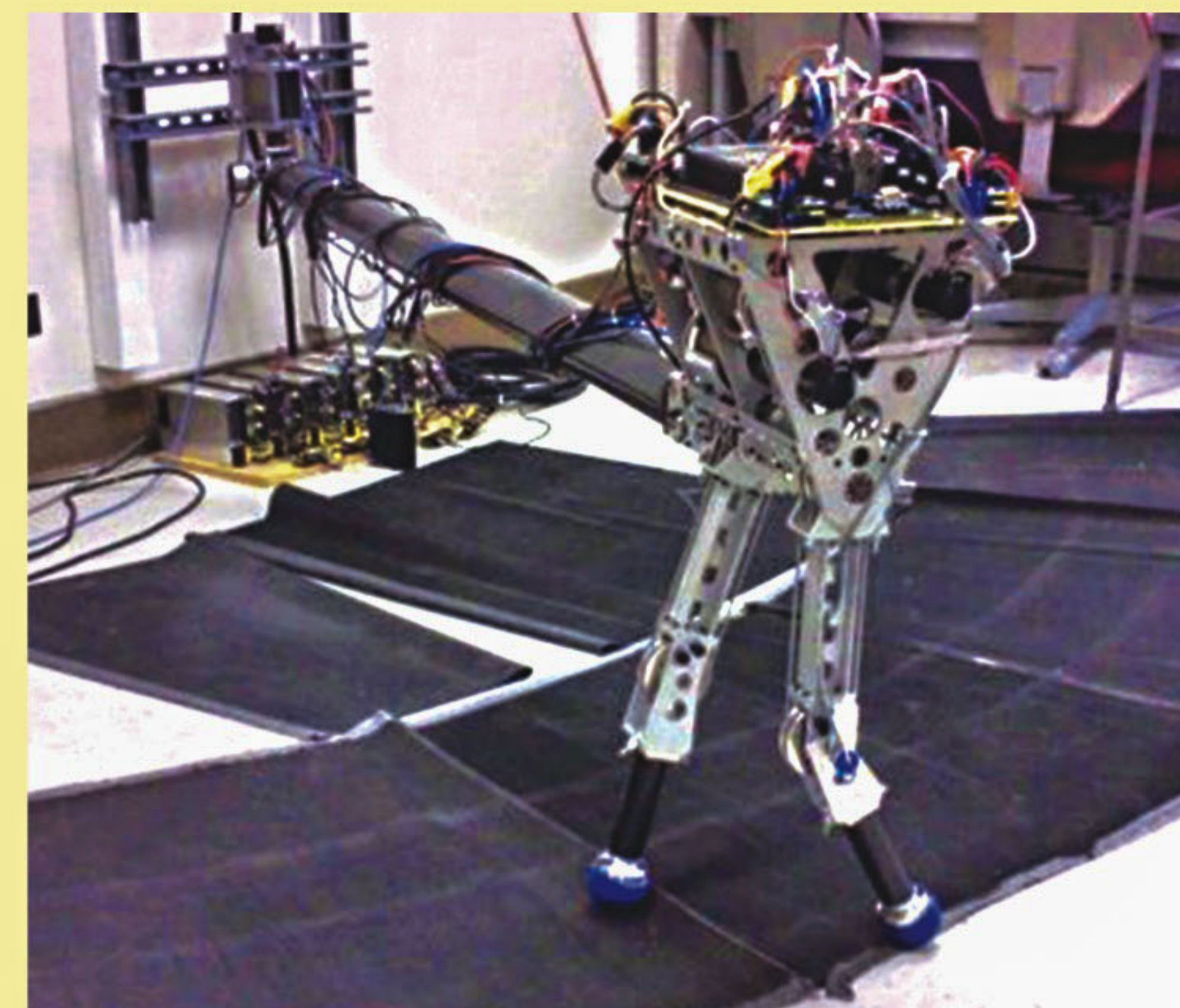
"There was also a science aspect to this decision: massive stars play a very crucial role in nature," he explains. "They synthesize the key elements of nature that form planets, they drive galaxy evolution, and they produce some of the highest energy explosions in the universe when they die as core-collapse supernova. I found it fascinating that this one sub-specialty of Astrophysics is so critical to understand so many other aspects of nature."

Other than this tremendous discovery, Khan's PhD thesis has one more interesting aspect. Unlike most students, who dedicate their thesis to their family, Khan has dedicated it to Bangladesh.

"I was educated in Bangladesh first," Khan says. "Anything and everything I achieved later was built on that. Our country, our language, our culture made me who I am. I wanted to dedicate my PhD thesis to the single most important factor in my life, and that was my country," says the achiever, pride evident in his words.

QUIRKY SCIENCE

## RESEARCHERS ARE TURNING 'STAR WARS' DROIDS INTO REALITY



After nearly 40 years of pop culture relevancy, the "Star Wars" saga is continuing this month with the Dec. 18 release of "Star Wars: The Force Awakens." Fans are lining up to see beloved characters return to the screen, including Han Solo and General Leia, and to welcome several new ones, including a variety of droids.

The enduring popularity of and interest in C-3PO and R2-D2 speaks to the fascination many people have with robotics and artificial intelligence. Although no one will have their own C-3PO soon, a number of University of Notre Dame researchers are working to make droids more science fact than science fiction.

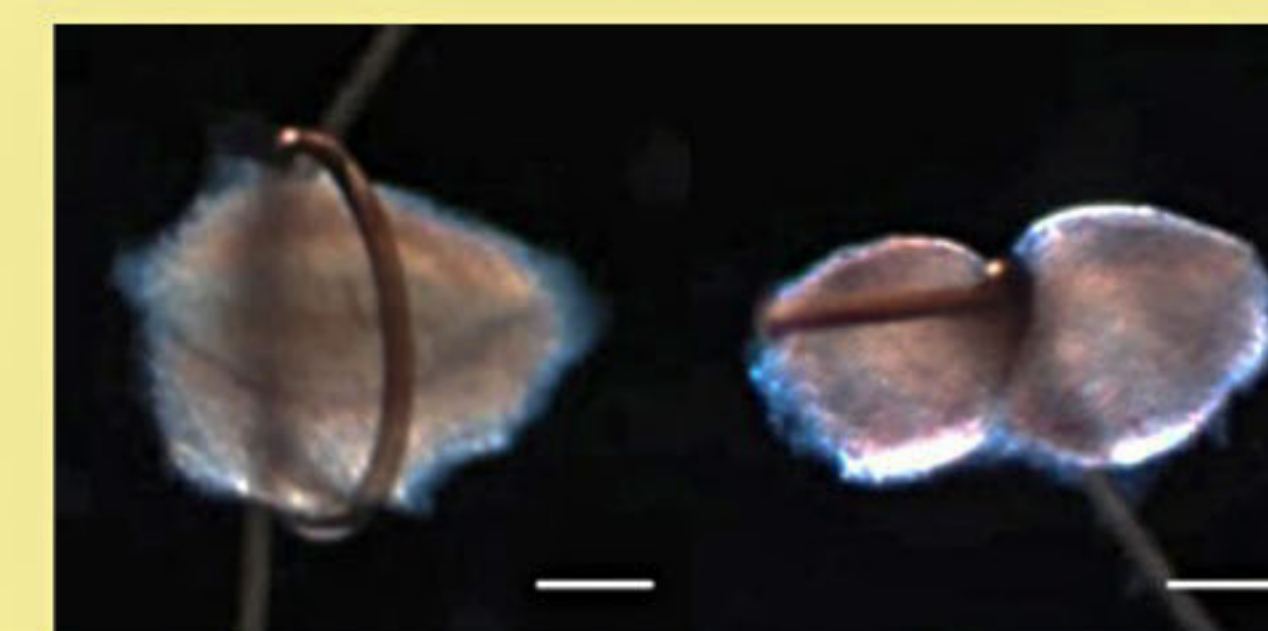
Sidney D'Mello, assistant professor of psychology and computer science and engineering, and his colleagues are researching the phenomena of "mind wandering" and are developing a software system that can both detect when a person's focus shifts from the task at hand and get that person to refocus. The researchers' vision is to make computer interfaces intelligent enough to spot a user's waning attention and take action. The system's software tracks a person's eye movements with a commercial eye tracker, a person's facial features with a webcam and the person's interaction patterns. If the system determines that the person's mind is wandering, it can pause the interaction, notify the person, plan a different type of interaction, or tag the interaction for future restudy. Their work also tracks emotions such as confusion, frustration, delight and boredom, in order to increase the bandwidth of interaction to encompass what people think and feel in addition to what they say or do.

## MULTIPLYING TEETH, LITERALLY

Researchers from the RIKEN Center for Developmental Biology, working with colleagues from the Tokyo Medical and Dental University, have found a way to -- literally -- multiply teeth. In mice, they were able to extract teeth germs -- groups of cells formed early in life that later develop into teeth, split them into two, and then implant the teeth into the mice's jaws, where they developed into two fully functional teeth.

Teeth are a major target of regenerative medicine. According to Takashi Tsuji, the leader of the team, approximately 10 percent of people are born with some missing teeth, and in addition, virtually all people lose some teeth to either accidents or disease as they age. Remedies such as implants and bridges are available, but they do not restore the full functionality of the teeth. Growing new teeth would be beneficial, but unfortunately humans only develop a limited number of teeth germs -- the rudimentary cell groups from which teeth grow.

Source: Sciencedaily.com



| FIVE THINGS |



PHOTO: PRABIR DAS

## 5 HEALTH REASONS TO DRINK COFFEE

There are thousands of good reasons why you need a cup of coffee every day in your life. A good cup of coffee not only acts as an amazing energy booster, but also the coffee aroma itself is able to help you deal with your stress. Read on to discover five health benefits associated with drinking coffee

- 1 Research shows that regular consumption of coffee lowers the risk of type 2 diabetes.
- 2 Drinking Coffee could lessen the symptoms of Parkinson's disease and can help people with Parkinson's disease control their movement. Also, the caffeine in coffee helps people not to develop Parkinson's disease.
- 3 Coffee is linked to lower risks for heart rhythm disturbances (which is a risk factor for heart attack and stroke) in men and women, and lower risk for strokes in women.
- 4 Study shows that high coffee consumption is associated with decreased risk of liver cirrhosis and liver cancer.
- 5 Drinking coffee can help you with your mental health as well. It can work as a brain fuel that can immediately improve your mood. A study confirms that those who drink four or more cups of coffee are less likely to feel depressed than those who do not drink it. The antioxidants present in this beverage makes you feel good and less depressed believe the researchers. How many more reasons you need to grab a cup of coffee?

Source: WebMD and Medicalnewstoday

| NUMBERS |

# 62

It is the number of the richest people in the world who have more money combined, than the poorest 3.6 billion people, according to a calculation made by Oxfam. The combined amount of their wealth is equivalent to the amount of world owned by half the world which is a remarkable concentration of wealth, believes Oxfam. In regard to Africa, it must be asked, what governments will do to maintain and improve the economic situation, whether by tackling tax evasion or tighter constraints on exporting money into offshore accounts.

Source: BBC



PHOTO: INTERNET