New moon suit for NASA's Artemis astronauts unveiled

In space, moon suits are the height of fashion, and NASA officials on Wednesday lavished praise on what astronauts will be wearing when they step on the moon in the coming years. "We're developing a spacesuit for a new generation," Robert D. Cabana, NASA's associate administrator, said during an event in Houston unveiling the new suit. The latest in lunar space wear — black with orange and blue highlights — comes from Axiom Space in Houston. By turning to this private company, NASA is again relying on new commercial space enterprises to provide key components faster and cheaper than it could itself develop.

The approach follows the template NASA used in hiring Elon Musk's company SpaceX to get astronauts to and from the International Space Station, and to the lunar surface on the mission for which the Axiom suits were designed.

The moon suit is a key component that is required for the Artemis program, which will be sending astronauts back to the moon as NASA faces heightened competition in space and on the moon from China's booming space sector. The Axiom suits will be worn during the Artemis III mission, the program's first moon landing, which is scheduled for 2025.

During Wednesday's reveal on a stage at Space Center Houston, James Stein, the suit's chief engineer, demonstrated the lunar gear, showing how he could easily squat and move around. The large clear bubble around the head provides wide visibility as well as lighting, which will be important when astronauts step into shadowed craters near the lunar south pole, where NASA hopes to study water ice at the bottom of cold, shadowed craters. It also has a mount for a high-definition camera.

Astronauts will get into and out of the spacesuit via a hatch in the backside. "You would put your feet in, put your arms in and then kind of shimmy down into the suit," said Russell Ralston, deputy program manager for extravehicular activity at Axiom Space. "And then we would close the hatch."

On the back is a backpack-like contraption containing the life support system. "You can think of it as a very fancy scuba tank and air-conditioner, kind of combined into one," Mr. Ralston said.

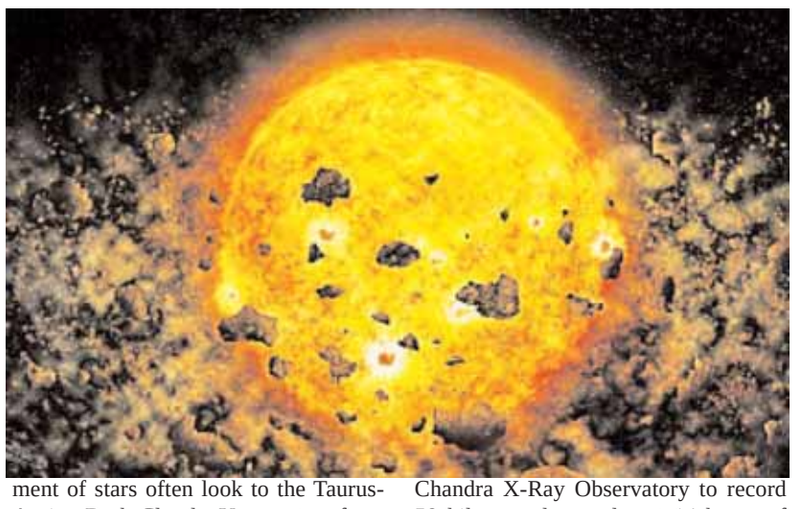
But the prototype shown Wednesday was not exactly what will be going to the moon. For one, the actual suits will be white instead of dark, reflecting heat from sunlight instead of absorbing it. In addition, the current outer covering keeps the inner portions from being scuffed or damaged during ground testing. For the moon, the suit will have an outer insulation layer to protect the astronaut from extreme temperatures, radiation and dust.

Axiom is led by Michael Suffredini, who previously served as NASA's program manager for the International Space Station.

The company has been primarily focused on low-Earth orbit, sending private astronauts to the I.S.S. and building a private module to be added to the space station. A variation of the moon suit could be used on a future Axiom private space station for spacewalks.

Outsourcing the development of spacesuits is a major course correction for NASA, which spent years and hundreds of millions of dollars developing its own suit called the Exploration Extravehicular Mobility Unit, or xEMU. The xEMU suits were to serve both for the upcoming moon missions and as replacements for the aging suits used for spacewalks at the International Space Station.

X-ray finds first evidence of a star devouring a planet



For nearly a century, astronomers have puzzled over the curious variability of young stars residing in the Taurus-Auriga constellation some 450 light years from Earth. One star in particular has drawn astronomers' attention.

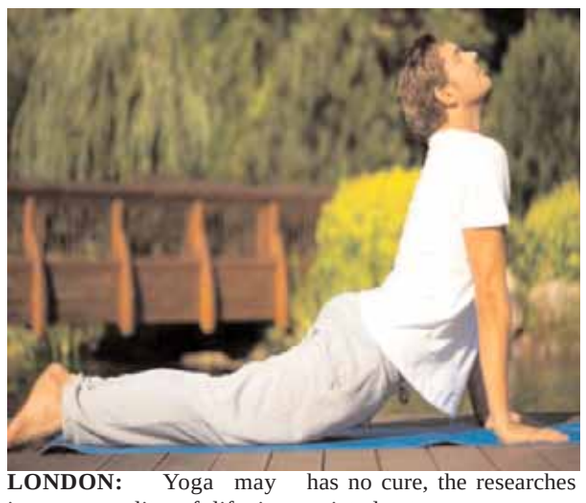
Now, physicists from MIT and elsewhere have observed the star, named RW Aur A, using Nasa's Chandra X-Ray Observatory. They've found evidence for what may have caused its most recent dimming event: a collision of two infant planetary bodies, which produced in its aftermath a dense cloud of gas and dust. As this planetary debris fell into the star, it generated a thick veil, temporarily obscuring the star's light.

"Computer simulations have long predicted that planets can fall into a young star, but we have never before observed that," says Hans Moritz Guenther, a research scientist in MIT's Kavli Institute for Astrophysics and Space Research. "If our interpretation of the data is correct, this would be the first time that we directly observe a young star devouring a planet or planets."

Scientists who study the early development of stars often look to the Taurus-Auriga Dark Clouds. Young stars form from the gravitational collapse of gas and dust within these clouds. Very young stars, unlike our comparatively mature sun, are still surrounded by a rotating disk of debris, including gas, dust, and clumps of material ranging in size from small dust grains to pebbles, and possibly to fledgling planets.

In January 2017, RW Aur A dimmed again, and the team used Nasa's Chandra X-Ray Observatory to record 50 kiloseconds, or almost 14 hours of X-ray data. An analysis revealed to researchers several surprising revelations: the star's disk hosts a large amount of material; the star is much hotter than expected; and the disk contains much more iron than expected—not as much iron as is found in the Earth, but more than, say, a typical moon in our solar system. - Science Daily

Yoga Can Make Life Better For People With Abnormal Heart Rhythm



LONDON: Yoga may improve quality of life in patients suffering from abnormal heart rhythm because it gives them a method to gain some self-control over their symptoms instead of feeling helpless, says a new study.

The researchers examined the effects of yoga on patients with paroxysmal atrial fibrillation (AF) in which faulty electrical signals and rapid heart rate begin suddenly and then stop on their own.

"Many patients with paroxysmal atrial fibrillation (AF) can't live their lives as they want to -- they refuse dinners with friends, concerts and travelling - because they are afraid of an AF episode occurring," said one of the researchers Maria Wahlstrom from Sophiahemmet University in Sweden.

"AF episodes are accompanied by chest pain, dyspnoea and dizziness," added Ms Wahlstrom in the study published in the European journal of cardiovascular nursing.

These symptoms are unpleasant and patients feel anxious, worried and stressed that an AF episode would occur.

AF is the most common cardiac rhythm disorder and has no cure, the researches pointed out.

Patients with paroxysmal AF experience episodes of AF usually lasting less than 48 hours and stop by themselves, although in some patients they can last up to seven days.

The team included 80 patients with paroxysmal AF who were randomised to yoga or a control group that did not do yoga.

Yoga was performed for one hour, once a week, for 12 weeks in the hospital with an experienced instructor, which included light movements, deep breathing and meditation.

After 12 weeks, the yoga group had higher "SF-36" mental health scores, lower heart rate and lower systolic and diastolic blood pressure than the control group.

"We found that patients who did yoga had a better quality of life, lower heart rate and lower blood pressure than patients who did not do yoga. The breathing and movement may have beneficial effects on blood pressure," Ms Wahlstrom stated.

"Patients in the yoga group said it felt good to let go of their thoughts and just be inside themselves for awhile," Ms Wahlstrom noted.

Lying in a foreign language may be easier: study

Most people find it easier to lie in a foreign language than in their native tongue, according to a study.

Forensic research has mostly focused on the perceived trustworthiness of people speaking in their native or a non-native language. This research has revealed that observers seem to be more likely to judge statements of native speakers as truthful compared to statements of non-native speakers. "Only little research, however, has investigated whether people do indeed lie less well in a non-native language," said Kristina Suchotzki from the University of Wurzburg in Germany.

The researchers conduced a number of experiments in which up to 50 test persons had to complete specific tasks. They were asked to answer a number of questions — sometimes truthfully and sometimes deceptively both in their native language and in a foreign language.

While the test participants answered the questions, the scientists measured their response time, skin conductance and heart rate.

They found that it takes longer to answer emotional questions than neutral ones. Answers in the foreign language also take longer than their native language counterparts. Generally, it takes longer to tell a lie than to tell the truth. However, the time differences between deceptive and truthful answers are less pronounced in a second language than in the native language. The slight difference does not, however, result from giving a faster deceptive response. Rather in a foreign language, telling the truth takes longer than in one's native tongue, researchers said.

The reason why this prolongation does not exist or is less pronounced in lying can be explained with the emotional distance hypothesis, researchers said. The greater emotional distance in a foreign language thus "cancels out" the higher cognitive load when lying, they said.

How bad is a glass of wine at dinner, really?

The world of alcohol research appears a little confused at the moment, at least from a public-messaging standpoint. A study published in Nature in March seems to offer some of the most compelling evidence yet that even moderate drinking can harm the brain.

After examining brain scans from more than 36,000 middle-aged and older people from the UK Biobank, researchers found that 50-year-olds who drank an average of one 175 millilitre (6 oz) glass of wine or half-litre (roughly 1 US pint) can of beer per day over the past year had brains that appeared 1.5 years older than counterparts who drank half that amount or not at all. Aging increased with alcohol consumption, the researchers wrote.

The study is one of the largest addressing the health impact of moderate drinking on the brain to date. Researchers defined moderate drinking as up to 14 drinks per week, and light as more than one drink per week but less than seven. But a lot of questions remain open.

Though the results of the brain study seem straightforward at first glance, digging a little deeper reveals how much we still don't know. Patricia Molina, who directs Louisiana State University's Alcohol and Drug Abuse Center of Excellence, said it remained unclear what the effects of two years of brain shrinkage — which caused the appearance of aging — were on cognition and behavior.

Several lines of evidence show a relationship between loss of brain volume and cognitive impairment, she said. But she is also unaware of any conclusive studies showing a direct relationship between specific percentages of decreased brain volume and clinical manifestations that are evident to people or their doctors. Molina said the study's design also made it difficult to answer questions about how its results compare with the shrinkage caused by other activities and illnesses known to cause a decrease in brain matter, such as a lack of physical fitness or Huntington's disease. "A meta-analysis would be the closest way of getting to the answer," Molina said. In other words, someone would have to look at the entire body of literature and analyse the results in a way that allows such comparisons to be made.

And another reason why such comparisons are hard to track, Molina said, is that different activities or illnesses cause different shrinkage in different places. Lounging around all day and eating only processed food, for example, might cause shrinkage in a different area of the brain than Huntington's disease. Then there's the chicken-and-egg dilemma. Could it be that people inclined to drink alcohol regularly just have smaller brains in general than those who choose to abstain?

"That is a distinct possibility," Molina said. "The only way of answering that question is by collecting brain images from early life." Researchers are looking to address this question through the Adolescent Brain Cognitive Development study, Molina said. That study tracks changes in brain volumes over time while collecting data on alcohol and drug use.

But isn't red wine good for you? The evidence that binge drinking is harmful for the body and brain is conclusive. But when it comes to moderate drinking, things get a little trickier.

A number of studies published over the past few decades, including one presented just a day before the brain study, appear to claim moderate drinking can actually be good for you. Analysing data also obtained through the UK Biobank from about 312,000 current drinkers, the researchers found that consuming the alcohol equivalent of about 5 ounces of wine with meals per day for women and 10 ounces for men was associated with a lower risk of developing type 2 diabetes.

EDUCATION PLUS

The culture of disciplines

How do you make the switch — entering a new field that challenges all you've learnt?

I teach in a field that is often referred to as a "crossroads discipline" — meaning, it stands at the intersection of many subjects and takes a bit from all of them. As a result, we have students entering the master's programme with many different undergraduate majors; everything from architecture to zoology (literally). Over the years, I've had the opportunity to see how students coming from different subject backgrounds approach this mixed-up field known as journalism and media studies. And I'm beginning to understand how this background structures the way they understand questions, study for tests, and write their answers.

Okay, I can hear you thinking, isn't this a problem for the teacher more than the student? Well, I think there's a lesson here for students too, perhaps something that will give them a leg up if they are shifting disciplines — especially when the distance between these disciplines seems to be large.

Variation

You may have noticed in school that every subject had a slightly different pattern of evaluation. In science classes, there was a practical component where your understanding of a process and its application were tested. In content-heavy subjects like history, geography, and to some extent, the sciences, your grasp of the information and your ability to present it well were tested. In mathematics, it was about solving problems based on rules while in English or any other language it was about demonstrating your vocabulary and the rules of structure, as well as the ability to express yourself. So each of these disciplines builds a certain kind of skill or understanding, which is tested in the exam with the appropriate kinds of questions.

As we go further in our education, we study a narrow range of subjects and so we seem to forget the diversity of testing approaches, and the different ways in which we prepared for and answered exams in all the different subjects we studied in school. We are at a further disadvantage if our school did not adequately differentiate between these approaches — as unfortunately, is more often than not the case.

But all said and done, here you are in college, maybe in a master's programme, and in a field that is quite different from anything you've studied before. It might be useful to spend some time trying to understand the "culture" of the new field. For instance:

What are the conventions and expectations that might affect how you study, how you prepare for tests, how you handle assignments and what you do in class?

Is it a field that is heavy in content (facts and figures that you need to know) or in process (how you solve problems and do things)?

Is there a fixed set of ideas that you are expected to become familiar with or is it more about exploration and comparison?

Is there an emphasis on originality and creativity or on established procedures?

To give you a specific example, students who come from engineering or applied science into journalism/media studies or indeed any social science or humanities discipline, struggle to move from a culture where they have mostly followed rules and procedures into one where the emphasis is on critical thinking, exploration, and expression. In the first instance, doing well on a test or exam depends on getting a narrow range of "correct" answers. In the second, there is usually no correct answer but your success depends on the ability to present and defend an argument. In the first, the culture demands compliance (mostly) while in the second it is about critique (mostly).

When you enter a new degree programme, I'm sure you take the time to figure out the "culture" of the new institution — how the hostel works, which mess offers the best food, where to get midnight snacks, and which student groups might be right for you and which ones to avoid. That's really important, of course. But it may also serve you well to take the time to figure out the culture of the discipline you are going to enter — especially if you are making a big academic shift.