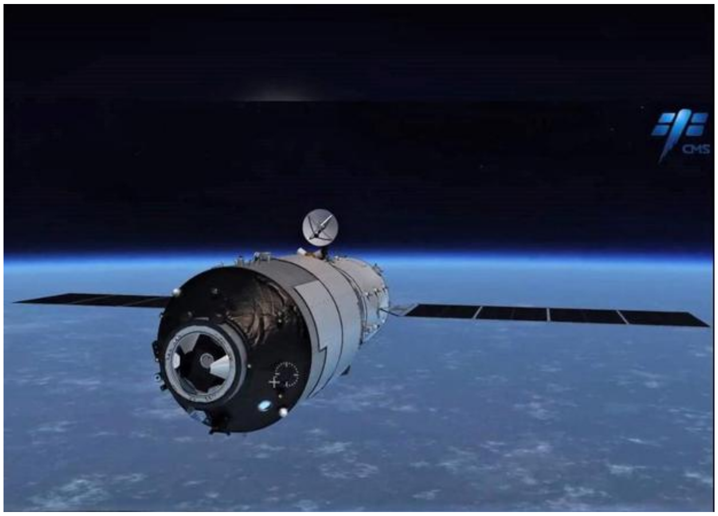
Space News Update

— March 30, 2018 —

Contents

1. China's space lab set for fiery re-entry



China's defunct space lab, Tiangong-1, should fall to Earth over the weekend.

At over 10m in length and weighing more than 8 tonnes, it is larger than most of the man-made objects that routinely re-enter Earth's atmosphere.

China has lost all communication with the module and so the descent will be uncontrolled.

However, experts say there is very low risk that any parts of Tiangong that do not burn up will hit a populated area.

"Given Tiangong-1 has a larger mass and is more robust, as it is pressurised, than many other space objects that return uncontrolled to Earth from space, it is the subject of a number of radar tracking campaigns," explained Richard Crowther, the UK Space Agency's chief engineer.

"The majority of the module can be expected to burn up during re-entry heating, with the greatest probability being that any surviving fragments will fall into the sea," he told BBC News.

- Precise knowledge of the re-entry time and location will come late
- Typically, only in the last hour or so are experts very confident
- Most of the module's components will burn up in the high atmosphere
- Its orbital path means any debris is restricted in where it can fall
- Perhaps 20-40% could survive to the surface - that's 1.5-3.5 tonnes
- The highest probability is that this material would hit the ocean
- Any debris path at the surface would be hundreds of km long
- Tiangong is the 50th most massive object to come back uncontrolled

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Launched in 2011 and visited by six Chinese astronauts, Tiangong was supposed to have been de-orbited in a planned manner.

The intention was to use its thrusters to drive the vehicle towards a remote zone over the Southern Ocean. But all command links were abruptly lost in 2016, and now nothing can be done to direct the fall.

Thirteen space agencies, **under the leadership of the European Space Agency**, are now following Tiangong's path around the globe, modelling its behaviour as it descends deeper into atmosphere.

The collective, known as the Inter-Agency Space Debris Coordination Committee (IADC), are trying to forecast the most likely time and place for the laboratory's re-entry.

The many uncertainties involved mean definitive statements can only be made close to the end of Tiangong's flight.

"A confidence of one hour is only reached about four hours beforehand. And one hour still means almost one revolution around the Earth," said Holger Krag, the head of Esa's space debris office. "But that's still good enough to exclude many countries and even some continents."

What can be said with certainty is that nothing will fall outside of 43 degrees from the equator, north or south.

This encompasses a region up to the Mediterranean and down to Tasmania, for example. It is governed by the inclination on which Tiangong was launched.

China has limited national tracking facilities around the globe and so had no choice but to keep the vessel on a reasonably tight equatorial path.

The International Space Station by contrast reaches 52 degrees north and south.

Although about 5.2 billion people live within the re-entry zone, most of it is ocean, which explains the high probability that any debris that survives to the surface will hit water.

Dr Krag said: "We know from similar events that on average between 20% and 40% of the initial mass has the chance to survive re-entry heating.

"We could apply this rule of thumb also to Tiangong, I believe, because typically the same amount of heat-resistant material in relative terms is onboard all spacecraft.

"So that would mean between 1.5 tonnes and 3.5 tonnes might be able to survive," he told BBC News.

The components that most often seem to avoid burning up in the atmosphere are tanks. These objects are interior to the spacecraft and so are protected for much of the descent.

But they are also made from steel, titanium or carbon-reinforced plastics and these materials are generally more resistant to high temperatures should they become exposed.

Tiangong is certainly on the large size for uncontrolled re-entry objects but it is far from being the biggest, historically.

The US space agency's Skylab was almost 80 tonnes in mass when it came back partially uncontrolled in 1979. Parts struck Western Australia but no-one on the ground was injured.

Nasa's Columbia shuttle would also have to be classed as an uncontrolled re-entry. Its mass was over 100 tonnes when it made its tragic return from orbit in 2003.

Again, no-one on the ground was hit as debris scattered through the US states of Texas and Louisiana.

The redoubtable cataloguer of space activity, Jonathan McDowell from the Harvard-Smithsonian Center for Astrophysics, reckons Tiangong is only the 50th most massive object to come back uncontrolled.

China is participating in the IADC campaign and is sharing some of its data.

The nation has since launched a second lab, Tiangong-2, which continues to be operational. It was visited by a re-fuelling freighter, Tianzhou-1, just last year.

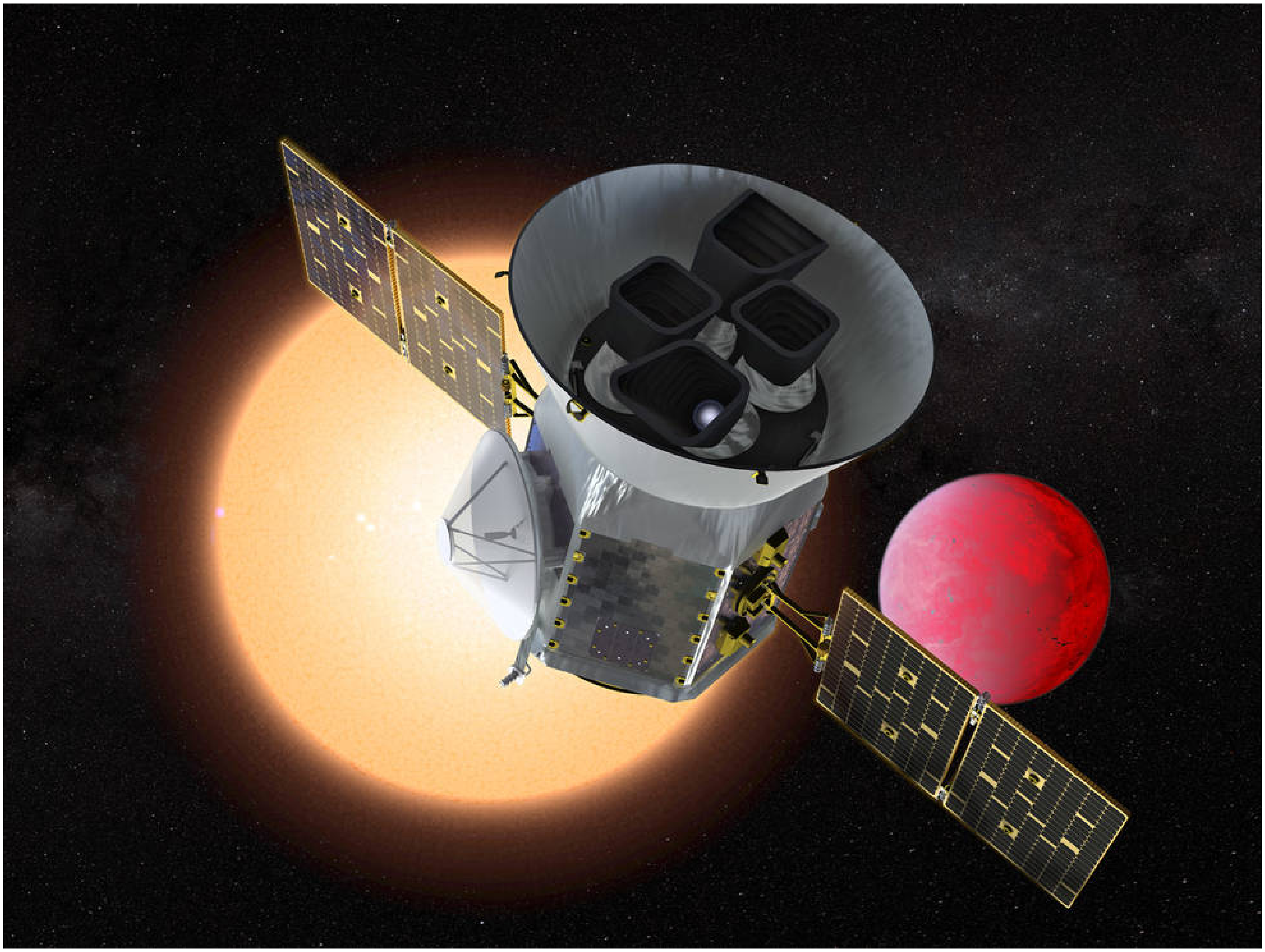
The Tiangongs were put up to demonstrate orbital rendezvous and docking capabilities - to be testbeds to rehearse activities ahead of China's more permanent space station.

This facility, which is expected to comprise a large core module and two smaller ancillary modules, will be in service early next decade, the Asian nation says.

A new rocket, the Long March 5, was recently introduced to perform the heavy lifting that will be required to get the core module in orbit.

Source: BBC Return to Contents

2. NASA Prepares to Launch Next Mission to Search Sky for New Worlds



NASA's Transiting Exoplanet Survey Satellite (TESS) is undergoing final preparations in Florida for its April 16 launch to find undiscovered worlds around nearby stars, providing targets where future studies will assess their capacity to harbor life.

"One of the biggest questions in exoplanet exploration is: If an astronomer finds a planet in a star's habitable zone, will it be interesting from a biologist's point of view?" said George Ricker, TESS principal investigator at the Massachusetts Institute of Technology (MIT) Kavli Institute for Astrophysics and Space Research in Cambridge, which is leading the mission. "We expect TESS will discover a number of planets whose atmospheric compositions, which hold potential clues to the presence of life, could be precisely measured by future observers."

On March 15, the spacecraft passed a review that confirmed it was ready for launch. For final launch preparations, the spacecraft will be fueled and encapsulated within the payload fairing of its SpaceX Falcon 9 rocket.

TESS will launch from Space Launch Complex 40 at Cape Canaveral Air Force Station in Florida. With the help of a gravitational assist from the Moon, the spacecraft will settle into a 13.7-day orbit around Earth. Sixty days after launch, and following tests of its instruments, the satellite will begin its initial two-year mission.

Four wide-field cameras will give TESS a field-of-view that covers 85 percent of our entire sky. Within this vast visual perspective, the sky has been divided into 26 sectors that TESS will observe one by one. The first year of observations will map the 13 sectors encompassing the southern sky, and the second year will map the 13 sectors of the northern sky.

The spacecraft will be looking for a phenomenon known as a transit, where a planet passes in front of its star, causing a periodic and regular dip in the star's brightness. NASA's Kepler spacecraft used the same method to spot more than 2,600 confirmed exoplanets, most of them orbiting faint stars 300 to 3,000 light-years away

"We learned from Kepler that there are more planets than stars in our sky, and now TESS will open our eyes to the variety of planets around some of the closest stars," said Paul Hertz, Astrophysics Division director at NASA Headquarters. "TESS will cast a wider net than ever before for enigmatic worlds whose properties can be probed by NASA's upcoming James Webb Space Telescope and other missions."

TESS will concentrate on stars less than 300 light-years away and 30 to 100 times brighter than Kepler's targets. The brightness of these target stars will allow researchers to use spectroscopy, the study of the absorption and emission of light, to determine a planet's mass, density and atmospheric composition. Water, and other key molecules, in its atmosphere can give us hints about a planets' capacity to harbor life.

"TESS is opening a door for a whole new kind of study," said Stephen Rinehart, TESS project scientist at NASA's Goddard Space Flight Center in Greenbelt, Maryland, which manages the mission. "We're going to be able study individual planets and start talking about the differences between planets. The targets TESS finds are going to be fantastic subjects for research for decades to come. It's the beginning of a new era of exoplanet research."

Through the TESS Guest Investigator Program, the worldwide scientific community will be able to participate in investigations outside of TESS's core mission, enhancing and maximizing the science return from the mission in areas ranging from exoplanet characterization to stellar astrophysics and solar system science.

"I don't think we know everything TESS is going to accomplish," Rinehart said. "To me, the most exciting part of any mission is the unexpected result, the one that nobody saw coming."

TESS is a NASA Astrophysics Explorer mission led and operated by MIT and managed by Goddard. George Ricker, of MIT's Kavli Institute for Astrophysics and Space Research, serves as principal investigator for the mission. TESS's four wide-field cameras were developed by MIT's Lincoln Laboratory. Additional partners include Orbital ATK, NASA's Ames Research Center, the Harvard-Smithsonian Center for Astrophysics, and the Space Telescope Science Institute. More than a dozen universities, research institutes and observatories worldwide are participants in the mission.

For more information on TESS, go to: **https://www.nasa.gov/tess**

Source: NASA

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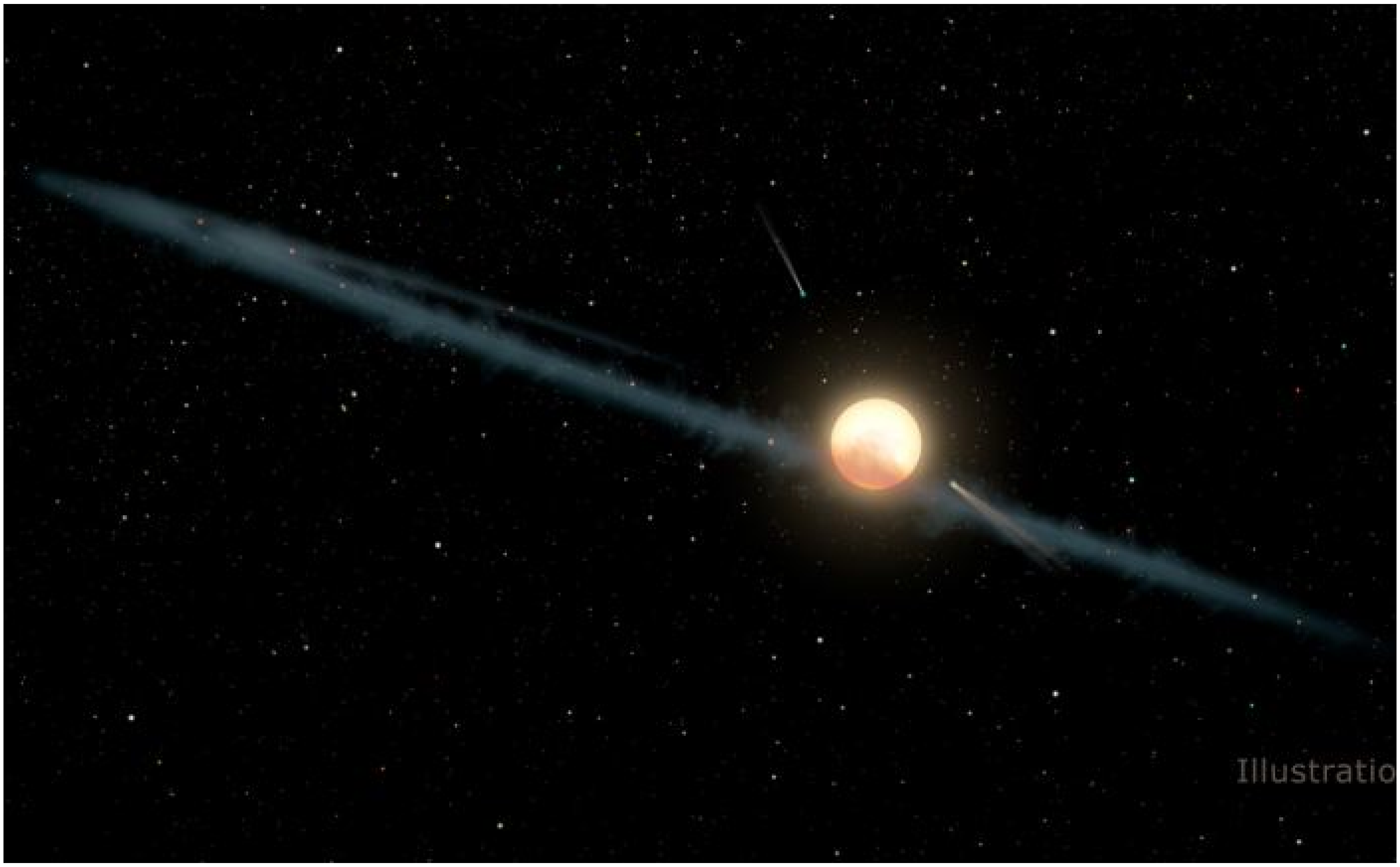
3. Tabby's Star is Dipping Again



In September of 2015, the star KIC 8462852 (aka. Tabby's Star) captured the world's attention when it was found to be experiencing a mysterious drop in brightness. In the years since then, multiple studies have been conducted that have tried to offer a natural explanation for this behavior – and even an unnatural one (i.e. the "alien megastructure" theory). At the same time, multiple observatories have been tracking the star regularly for further dimming.

Well, it seems that Tabby's Star is at it again! On Friday, March 16th, Tabetha Boyajian (the astronomer who was responsible for discovering the star's variations in flux) and her colleagues reported that the star was dimming yet again. As they indicated recently their blog – Where's the Flux? – the star experienced its greatest dip since it was observed by the *Kepler* mission in 2013.

To recap, in 2015, when Boyajian and her team first reported this strange behavior, Tabby's Star was observed to be dimming by as much as 22% – at different intervals and for different lengths of time. Since then, explanations for this behavior have ranged from a a circumstellar debris disk, shattered comets or asteroids, the presence of a giant planet, a planet with rings, or even a planet that had been consumed in the past.

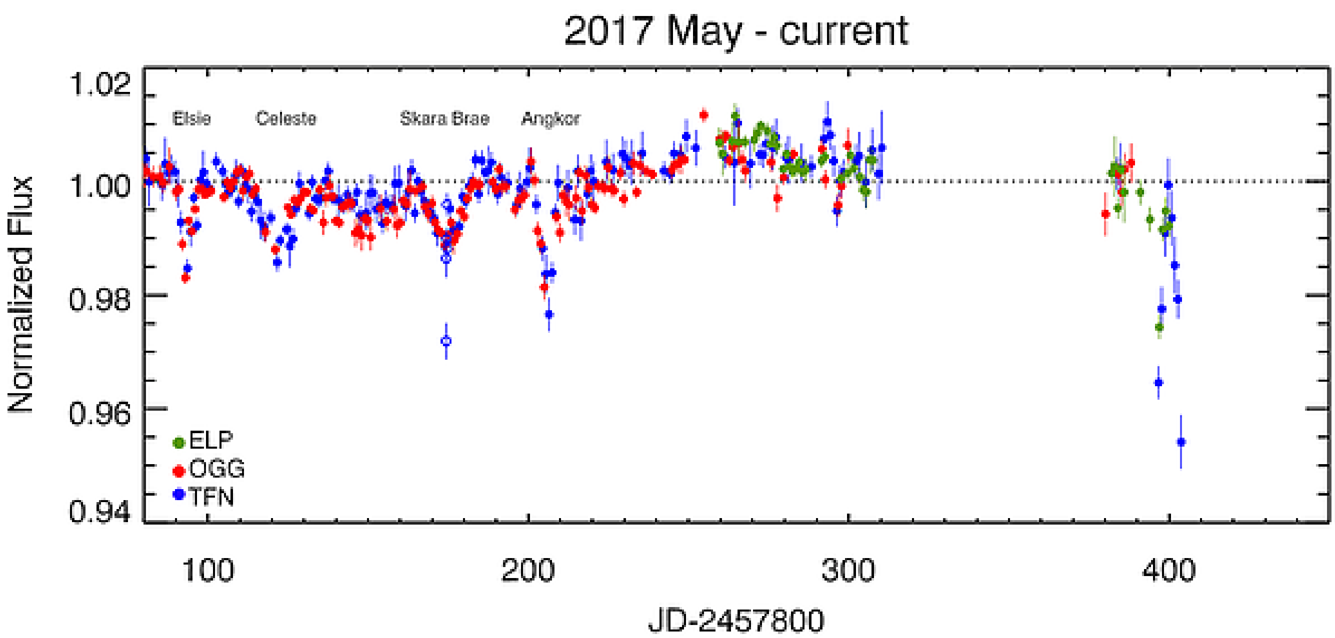
However, back in January, Tabetha Boyajian and a team of over 100 astronomers conducted a new study which demonstrated that KIC 8462852 (aka. "Tabby's Star") was likely being partially obscured by dust. This study effectively put to rest speculation that the dimming could be caused by an alien megastructure and offered conclusive evidence that the flux was the result of a natural phenomenon.

Nevertheless, on March 19th, Tabetha and her team began reporting how the star's brightness was once again dropping. Using data obtained by the Las Cumbras Observatory's Teide, McDonald and Haleakala

Observatories (in Spain, Texas and Hawaii, respectively), they began posting regular updates on its light curve. As they wrote on their blog at the time:

"On Friday (2018 March 16) we noted the last data taken were significantly down compared to normal. Due to poor weather conditions at all 3 sites we weren't able to observe the star again until last night... This is the deepest dip we have observed since the Kepler Mission in 2013! WOW!!"

On March 22nd, the team provided an updated light curve which indicated that the star was rapidly returning to its normal brightness. As they indicated, "The profile of the new dip having a slow decline with a more rapid increase is again reminiscent to that of a backwards-comet." On March 23rd, observations from the Catalonia Institute for Space Studies' (IEEC) Montsec Astronomical Observatory were also included, which indicated the same.



An update from March 26th indicated that the star's flux had dropped by a total of 5%, a finding which was confirmed by John Hall – an observer with the American Association of Variable Star Observers. This constituted the greatest dip since the 22% reported in 2015. As Boyajian declared at the time, "Looks like we beat the record set just last week on the deepest dip observed since Kepler!"

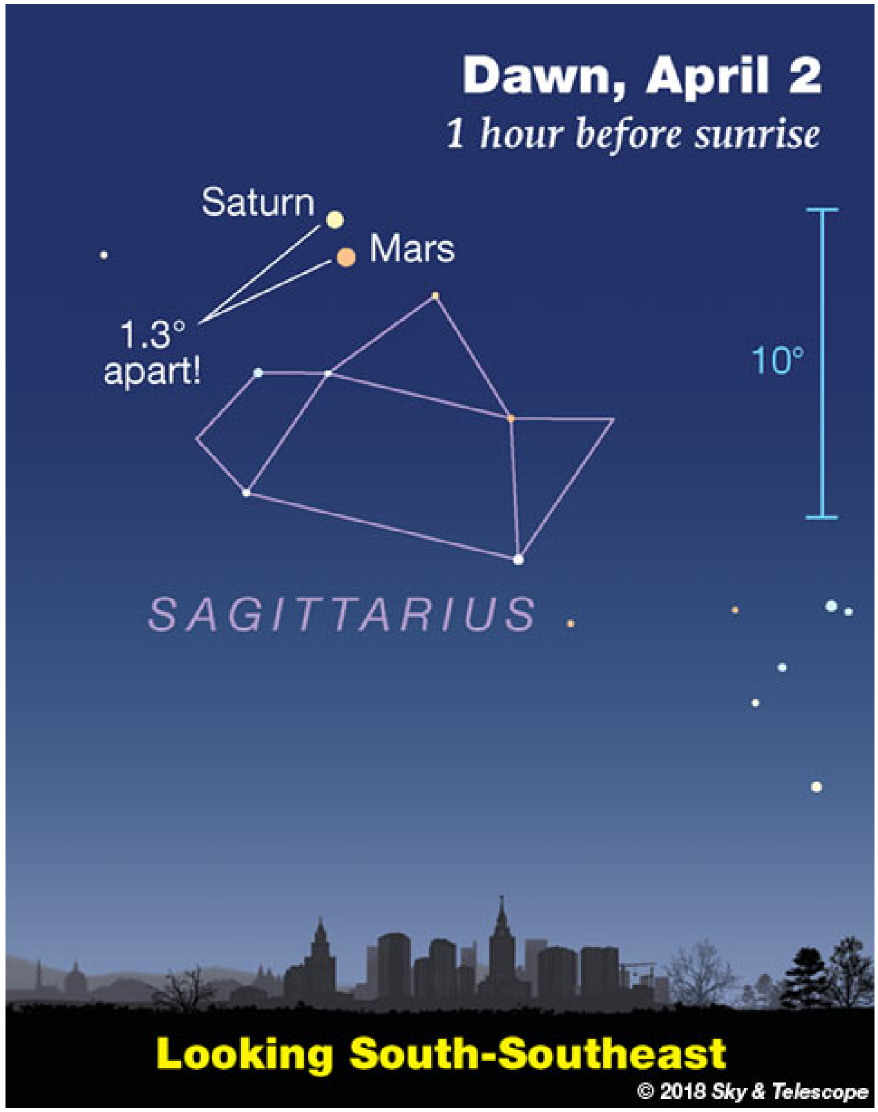
The latest update, from March 27th, indicates that despite bad weather at two of their sites, new data had been obtained which indicated that the star's flux was going back up again, but was still ~2% below normal. In short, it seems that this latest dimming event – the largest since the team first noticed a change in the star's flux – has peaked and the star is returning to normal.

While this latest dip in light does not cast the obscuring dust conclusion into doubt, it does show that the mystery of Tabby's Star may not be completely resolved yet. Based on this and future dimming events, scientists may be forced to refine their theories further. In the end, its all about the process of continuous discovery. And Tabby's Star is proving to be a very interesting case!

However, one can almost certainly guarantee that fans of the "alien megastructure" theory are going to see this as good news!

Source: Universe Today Return to Contents

The Night Sky



Friday, March 30

• After nightfall, Orion is still well up in the southwest in his spring orientation: striding down to the right, with his belt horizontal. Shining above the belt is bright orange Betelgeuse. Down below the belt is bright white Rigel.

• Now that it's spring, the signature fall-and-winter constellation Cassiopeia retreats downward after dark. But for skywatchers at mid-northern latitudes Cassiopeia is circumpolar, never going away completely. Look for it fairly low in the north-northwest these evenings. Its W pattern stands roughly on end. By midnight or 1 a.m. it's at its lowest due north, lying not quite horizontally.

Saturday, March 31

• Full Moon (exact at 8:37 a.m. EDT). Look lower right of the Moon for Spica. Look three times farther left of the Moon for brighter Arcturus.

Sunday, April 1

• Now Spica shines to the Moon's upper right.

• Before dawn on Monday morning April 2rd, **Mars and Saturn are in conjunction**, 1.3° apart. Spot them in the south-southeast, as shown above. They're not quite equal; Mars is 0.2 magnitude brighter, and it's tinted a deeper, fiery orange-yellow compared to Saturn's pale yellow-white.

Monday, April 2

• The Big Dipper glitters softly high in the northeast after dusk, tipping leftward on its handle. You probably know that the two stars forming the front of the Dipper's bowl (currently on top) are the Pointers; they ***p***oint to ***P***olaris, currently to their lower left. And, you may know that if you follow the curve of the Dipper's handle out and around by a little more than a Dipper length, you'll ***arc*** to ***Arc***turus, now low in the east.

But did you know that if you follow the Pointers backward the opposite way, you'll ***l***and in ***L***eo?

Draw a line diagonally across the Dipper's bowl from where the handle is attached, continue far on, and you'll ***g***o to ***G***emini.

And look at the two stars forming the open top of the Dipper's bowl. Follow this line past the bowl's lip far across the sky, and you ***c***ome to ***C***apella.

• By 11 p.m. the waning gibbous Moon is well up in the east-southeast. Look for Jupiter glaring some 7° below it. They rise higher into the early-morning hours. As dawn begins on Tuesday morning the 3rd, you'll find the Moon and Jupiter in the south-southwest.

Tuesday, April 3
• Capella is the bright star high in the west-northwest during and after dusk. Its pale-yellow color matches that of the Sun, meaning they're both about the same temperature. But otherwise Capella is very different. It consists of two yellow giant stars orbiting each other rather closely every 104 days.

Moreover, for telescope users, Capella is distantly accompanied by a tight pair of red dwarfs: Capella H and L, magnitudes 10 and 13. Article and finder charts.

Source: Sky & Telescope Return to Contents

ISS Sighting Opportunities

For Denver:

Date	Visible	Max Height	Appears	Disappears
Fri Mar 30, 8:05 PM	3 min	16°	15° above NNW	10° above NNE
Fri Mar 30, 9:43 PM	< 1 min	10°	10° above N	10° above N
Sat Mar 31, 8:50 PM	1 min	10°	10° above NNW	10° above N
Sun Apr 1, 7:56 PM	2 min	12°	10° above NNW	10° above N
Sun Apr 1, 9:34 PM	1 min	11°	10° above N	11° above N
Mon Apr 2, 8:42 PM	1 min	10°	10° above N	10° above NNE
Tue Apr 3, 7:49 PM	1 min	10°	10° above NNW	10° above N
Tue Apr 3, 9:26 PM	1 min	15°	11° above NNW	15° above N

Sighting information for other cities can be found at NASA's Satellite Sighting Information

NASA-TV Highlights
(all times Eastern Daylight Time)

6 p.m., 10 p.m., Friday, March 30 - Replay of SpaceCast Weekly (all channels)

2:30 p.m., Sunday, April 1 - CRS-14 "What's On Board" Briefing (all channels)

4 p.m., Sunday, April 1 - CRS-14 Prelaunch News Conference (all channels)

7:30 a.m., Monday, April 2 - ISS Expedition 55 In-Flight Event for JAXA with the Yoshikawa City Child Center in Japan and Flight Engineer Norishige Kanai of the Japan Aerospace Exploration Agency – Johnson Space Center (NTV-1 with interpretation; NTV-3 in native language) (all channels)

4 p.m., Monday, April 2 - Coverage of the Launch of the SpaceX CRS-14 Mission (Launch scheduled at 4:30 p.m. EDT) (all channels)

6:30 p.m., Monday, April 2 - SpaceX CRS-14 Post-Launch News Conference (Time subject to change) (all channels)

11 a.m., Tuesday, April 3 - Low Boom Flight Demonstrator (LBFD) X- Plane Build News Conference (all channels)

Watch NASA TV on the Net by going to the NASA website.

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Space Calendar

- Mar 30 - [Mar 28] Iridium Next 41-50 Falcon 9 Launch
- Mar 30 - Comet 312P/NEAT At Opposition (3.803 AU)
- Mar 30 - Comet P/2014 U4 (PANSTARRS) At Opposition (4.079 AU)
- Mar 30 - Comet C/2018 B1 (Lemmon) Perihelion (5.117 AU)
- Mar 30 - Apollo Asteroid 2018 FB2 Near-Earth Flyby (0.026 AU)
- Mar 30 - [Mar 24] Apollo Asteroid 2018 FO3 Near-Earth Flyby (0.076 AU)
- Mar 30 - Apollo Asteroid 37655 Illapa Closest Approach To Earth (0.283 AU)
- Mar 30 - Asteroid 3590 Holst Closest Approach To Earth (1.181 AU)
- Mar 30 - Asteroid 9537 Nolan Closest Approach To Earth (1.387 AU)
- Mar 30 - Asteroid 4864 Nimoy Closest Approach To Earth (1.832 AU)
- Mar 30 - Asteroid 3714 Kenrussell Closest Approach To Earth (1.867 AU)
- Mar 30 - Asteroid 1801 Titicaca Closest Approach To Earth (2.075 AU)
- Mar 30 - Asteroid 249521 Truth Closest Approach To Earth (2.370 AU)
- Mar 31 - Comet 105P/Singer Brewster At Opposition (1.276 AU)
- Mar 31 - Comet C/2017 F2 (PANSTARRS) Closest Approach To Earth (6.070 AU)
- Mar 31 - Asteroid 16 Psyche Occults TYC 6185-00126-1 (11.3 Magnitude Star)
- Mar 31 - Aten Asteroid 2010 GD35 Near-Earth Flyby (0.040 AU)
- Mar 31 - Apollo Asteroid 2001 FA58 Near-Earth Flyby (0.097 AU)
- Mar 31 - Asteroid 4763 Ride Closest Approach To Earth (1.404 AU)
- Mar 31 - Asteroid 784 Pickeringia Closest Approach To Earth (1.712 AU)
- Mar 31 - Asteroid 9252 Goddard Closest Approach To Earth (2.580 AU)

- Apr 01 - Moon Occults Asteroid 21 Lutetia
- Apr 01 - Apollo Asteroid 2018 EM4 Near-Earth Flyby (0.016 AU)
- Apr 01 - Amor Asteroid 2018 FV1 Near-Earth Flyby (0.086 AU)
- Apr 01 - Apollo Asteroid 2007 RX8 Near-Earth Flyby (0.085 AU)
- Apr 01 - Asteroid 100000 Astronautica Closest Approach To Earth (1.067 AU)
- Apr 01 - Apollo Asteroid 12923 Zephyr Closest Approach To Earth (1.365 AU)
- Apr 01 - Asteroid 9133 d'Arrest Closest Approach To Earth (2.081 AU)
- Apr 01 - Sergey Volkov's 45th Birthday (1973)
- Apr 02 - [Mar 30] CRS-14 Falcon 9 Launch (International Space Station)
- Apr 02 - Mars Passes 1.3 Degrees From Saturn
- Apr 02 - Comet 73P-S/Schwassmann-Wachmann Closest Approach To Earth (1.178 AU)
- Apr 02 - Comet 316P/LONEOS-Christensen Closest Approach To Earth (3.533 AU)
- Apr 02 - Comet C/2017 F2 (PANSTARRS) At Opposition (6.070 AU)
- Apr 02 - Aten Asteroid 2004 FG29 Near-Earth Flyby (0.010 AU)
- Apr 02 - Apollo Asteroid 2018 ER1 Near-Earth Flyby (0.040 AU)
- Apr 02 - Aten Asteroid 3554 Amun Closest Approach To Earth (1.116 AU)
- Apr 02 - Asteroid 16260 Sputnik Closest Approach To Earth (1.865 AU)
- Apr 02 - 55th Anniversary (1963), Luna 4 Launch (Soviet Moon Flyby Mission)
- Apr 02 - Francesco Grimaldi's 400th Birthday (1618)
- Apr 03 - Moon Occults Asteroid 16 Psyche
- Apr 03 - Asteroid 9995 Alouette Closest Approach To Earth (1.046 AU)
- Apr 03 - Asteroid 26732 Damianpeach Closest Approach To Earth (1.438 AU)
- Apr 03 - Asteroid 84566 VIMS Closest Approach To Earth (1.523 AU)
- Apr 03 - Asteroid 4804 Pasteur Closest Approach To Earth (2.024 AU)
- Apr 03 - Asteroid 163800 Richardnorton Closest Approach To Earth (2.106 AU)
- Apr 03 - Asteroid 12432 Usuda Closest Approach To Earth (2.160 AU)
- Apr 03 - Asteroid 1877 Marsden Closest Approach To Earth (3.102 AU)
- Apr 03 - 45th Anniversary (1973), Salyut 2 Launch (USSR's 2nd Space Station)

Source: JPL Space Calendar

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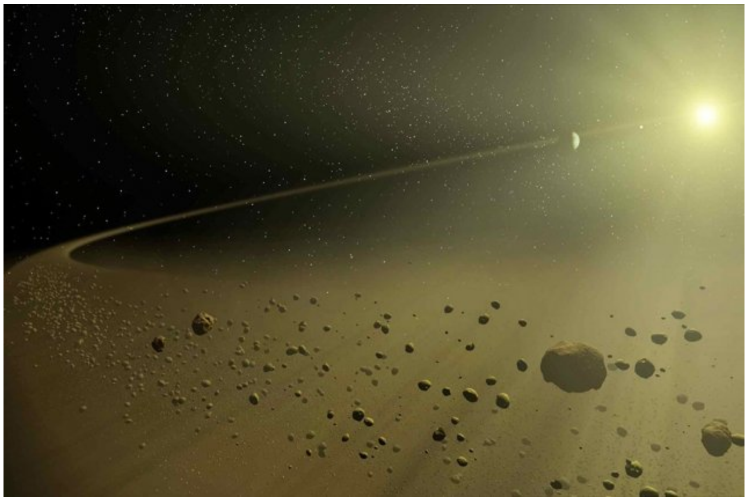
Food for Thought

Computer searches telescope data for evidence of distant planets



As part of an effort to identify distant planets hospitable to life, NASA has established a crowdsourcing project in which volunteers search telescopic images for evidence of debris disks around stars, which are good indicators of exoplanets.

Using the results of that project, researchers at MIT have now trained a machine-learning system to search for debris disks itself. The scale of the search demands automation: There are nearly 750 million possible light sources in the data accumulated through NASA's Wide-Field Infrared Survey Explorer (WISE) mission alone.

In tests, the machine-learning system agreed with human identifications of debris disks 97 percent of the time. The researchers also trained their system to rate debris disks according to their likelihood of containing detectable exoplanets. In a paper describing the new work in the journal *Astronomy and Computing*, the MIT researchers report that their system identified 367 previously unexamined celestial objects as particularly promising candidates for further study.

The work represents an unusual approach to machine learning, which has been championed by one of the paper's coauthors, Victor Pankratius, a principal research scientist at MIT's Haystack Observatory. Typically, a machine-learning system will comb through a wealth of training data, looking for consistent correlations between features of the data and some label applied by a human analyst—in this case, stars circled by debris disks.

But Pankratius argues that in the sciences, machine-learning systems would be more useful if they explicitly incorporated a little bit of scientific understanding, to help guide their searches for correlations or identify deviations from the norm that could be of scientific interest.

"The main vision is to go beyond what A.I. is focusing on today," Pankratius says. "Today, we're collecting data, and we're trying to find features in the data. You end up with billions and billions of features. So what are you doing with them? What you want to know as a scientist is not that the computer tells you that certain pixels are certain features. You want to know 'Oh, this is a physically relevant thing, and here are the physics parameters of the thing.'"

Classroom conception

The new paper grew out of an MIT seminar that Pankratius co-taught with Sara Seager, the Class of 1941 Professor of Earth, Atmospheric, and Planetary Sciences, who is well-known for her exoplanet research. The seminar, Astroinformatics for Exoplanets, introduced students to data science techniques that could be useful for interpreting the flood of data generated by new astronomical instruments. After mastering the techniques, the students were asked to apply them to outstanding astronomical questions.

For her final project, Tam Nguyen, a graduate student in aeronautics and astronautics, chose the problem of training a machine-learning system to identify debris disks, and the new paper is an outgrowth of that work. Nguyen is first author on the paper, and she's joined by Seager, Pankratius, and Laura Eckman, an undergraduate majoring in electrical engineering and computer science.

From the NASA crowdsourcing project, the researchers had the celestial coordinates of the light sources that human volunteers had identified as featuring debris disks. The disks are recognizable as ellipses of light with slightly brighter ellipses at their centers. The researchers also used the raw astronomical data generated by the WISE mission.

To prepare the data for the machine-learning system, Nguyen carved it up into small chunks, then used standard signal-processing techniques to filter out artifacts caused by the imaging instruments or by ambient light. Next, she identified those chunks with light sources at their centers, and used existing image-segmentation algorithms to remove any additional sources of light. These types of procedures are typical in any computer-vision machine-learning project.

Coded intuitions

But Nguyen used basic principles of physics to prune the data further. For one thing, she looked at the variation in the intensity of the light emitted by the light sources across four different frequency bands. She also used standard metrics to evaluate the position, symmetry, and scale of the light sources, establishing thresholds for inclusion in her data set.

In addition to the tagged debris disks from NASA's crowdsourcing project, the researchers also had a short list of stars that astronomers had identified as probably hosting exoplanets. From that information, their system also inferred characteristics of debris disks that were correlated with the presence of exoplanets, to select the 367 candidates for further study.

"Given the scalability challenges with big data, leveraging crowdsourcing and citizen science to develop training data sets for machine-learning classifiers for astronomical observations and associated objects is an innovative way to address challenges not only in astronomy but also several different data-intensive science areas," says Dan Crichton, who leads the Center for Data Science and Technology at NAASA's Jet Propulsion Laboratory. "The use of the computer-aided discovery pipeline described to automate the extraction, classification, and validation process is going to be helpful for systematizing how these capabilities can be brought together. The paper does a nice job of discussing the effectiveness of this approach as applied to debris disk candidates. The lessons learned are going to be important for generalizing the techniques to other astronomy and different discipline applications."

"The Disk Detective science team has been working on its own machine-learning project, and now that this paper is out, we're going to have to get together and compare notes," says Marc Kuchner, a senior astrophysicist at NASA's Goddard Space Flight Center and leader of the crowdsourcing disk-detection project known as Disk Detective. "I'm really glad that Nguyen is looking into this because I really think that this kind of machine-human cooperation is going to be crucial for analyzing the big data sets of the future."

Source: Phys.org Return to Contents

Space Image of the Week

NGC 247 and Friends
Image Credit & Copyright: CHART32 Team, *Processing* - Johannes Schedler

Explanation: About 70,000 light-years across, NGC 247 is a spiral galaxy smaller than our Milky Way. Measured to be only 11 million light-years distant it is nearby though. Tilted nearly edge-on as seen from our perspective, it dominates this telescopic field of view toward the southern constellation Cetus. The pronounced void on one side of the galaxy's disk recalls for some its popular name, the Needle's Eye galaxy. Many background galaxies are visible in this sharp galaxy portrait, including the remarkable string of four galaxies just below and left of NGC 247 known as Burbidge's Chain. Burbidge's Chain galaxies are about 300 million light-years distant. The deep image even reveals that the two leftmost galaxies in the chain are apparently interacting, joined by a faint bridge of material. NGC 247 itself is part of the Sculptor Group of galaxies along with the shiny spiral NGC 253.

Source: APOD

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