

Space

Spaceport nears approval

Take 2: Spacewalkers install new solar panel

CAPE CANAVERAL, Fla., June 21, (AP) — Spacewalking astronauts equipped the International Space Station with the first in a series of powerful new solar panels Sunday, overcoming suit problems and other obstacles with muscle and persistence.

It took two spacewalks for French astronaut **Thomas Pesquet** and NASA astronaut Shane Kimbrough to install and unfurl the panel to its full 63 feet (19 meters) in length.

The solar wing unrolled like a red carpet once the final set of bolts was released, relying solely on pent-up energy. The slow but steady extension took 10 minutes, with station cameras providing live TV views.

"It is beautiful," Pesquet called out.

"Well done, both of you," Mission Control replied once the operation was complete. "That was great to see."



Pesquet

As the 6 1/2-hour spacewalk concluded, Kimbrough, who has three children, wished "Happy Father's Day" to all the flight controller dads. "Thanks for working with us on a Sunday."

The astronauts started Sunday's spacewalk picking up where they left off Wednesday, when a string of problems prevented them from unrolling the high-tech solar panel.

"Remember: You are butterflies with biceps today," astronaut Megan McArthur radioed from inside.

After pushing and tugging, the spacewalkers managed to unfold and align the solar panel so both halves were now end to end, resembling a roll of paper towels. Their shout of "Woo-hoo!" was met with applause in Mission Control.

The two had to wait until they were back on the night side of Earth - and the station's old solar panels were no longer soaking up sunlight and generating power - before making the final power connections. Otherwise, they could be shocked.

While awaiting darkness, the camera-and-light assembly on Kimbrough's helmet came loose, even though he'd switched to a different suit to avoid the trouble he encountered last time. Pesquet did his best to secure it with wire ties, as the minutes ticked by. His effort paid off, and the final step - the actual unfurling - went off without a hitch.

Experiments

This new solar wing - with five more to come - will give the aging station a much needed electrical boost, as demand for experiments and space tourists grows.

NASA originally allotted two spacewalks for the job - one for each solar panel being installed. But managers added a third spacewalk, given all the earlier problems. Pesquet and Kimbrough will go back out Friday to complete work on the second panel delivered by Space X earlier this month.

This first pair will augment the space station's oldest solar wings, which are degrading after 20 years of continuous operation.

SpaceX will deliver two more pairs over the next year.

Although smaller than the originals, the new solar panels supplied by Boeing can generate considerably more power. The space station needs this reenergizing if NASA hopes to keep the space station running the rest of this decade, with private guests paying millions of dollars to come aboard.

A Russian film crew is scheduled to launch to the orbiting outpost this fall from Kazakhstan, followed by a string of rich businessmen. SpaceX is providing the rides from Cape Canaveral.

On Wednesday, the display control panel on Kimbrough's suit conked out and he had to return to the air lock to reset it. Then his cooling system registered a momentary pressure spike. Engineers are still evaluating what went wrong.

"Space is hard," Kimbrough tweeted last week.

Meanwhile, after nine years of planning and \$10 million invested by local taxpayers, county officials in Georgia's coastal southeast corner came a big step closer Thursday to winning federal approval of a project engineered to literally inject the local economy with rocket fuel.

Since 2012, Camden County on the Georgia-Florida line has doggedly pursued plans to build and operate the 13th licensed US commercial rocket launch pad for blasting satellites into orbit. It's been a bumpy ride, with critics concerned that explosive misfires might threaten a protected barrier island popular with campers and possibly a Navy base entrusted with nuclear weapons.

The project came closer to fruition Thursday, when the Federal Aviation Administration issued its final study on Spaceport Camden's environmental impacts. The agency concluded that building the spaceport was its "preferred alternative," as opposed to scrapping the project. That paves the way for a final decision in July on its license to operate a launch site.

Even if approved, there's no guarantee the project will fire its first rocket anytime soon. Despite increased demand for commercial launches in the past decade, more than half of licensed U.S. spaceports have never held a licensed launch.

Regardless, Steve Howard, Camden County's government administrator, insists the community of 55,000 is seizing a "once-in-a-generation opportunity" not only to join the commercial space race, but to lure supporting industries and tourists.

"For us, it's never been about the rockets. It's about everything else," Howard said. "The rockets and the spaceport are a catalyst. What we want is everything else around it: R&D, manufacturing, payload processing, STEM programs, tourism."

If the Federal Aviation Administration grants Spaceport Camden a license, the county plans to buy 4,000 acres (1,600 hectares) near the coast that during the 1960s was used to manufacture and test rocket motors for NASA.

Launch

Camden County would join 19 total US sites available to launch commercial rockets. Five are US government sites such as Cape Canaveral in Florida. Two private sites in Texas were built for the sole use of their owners, SpaceX and Blue Origin.

Camden County would join the remaining dozen, which are essentially launch pads for hire by companies with their own rockets. According to the FAA, seven of those sites - in Florida, Texas, Colorado and Oklahoma - have never held a licensed launch.

"Operators of active spaceports and launch providers expressed concerns that FAA is licensing sites that may never host a launch," the US Government Accountability Office said in a December report, "although other spaceport operators mentioned that the sites could be suitable for future operations."

Opponents of Spaceport Camden contend it's in an unsafe location. Its launch path would send rockets over two barrier islands, Cumberland Island and Little Cumberland Island, about 5 miles (8 kilometers) to the east.

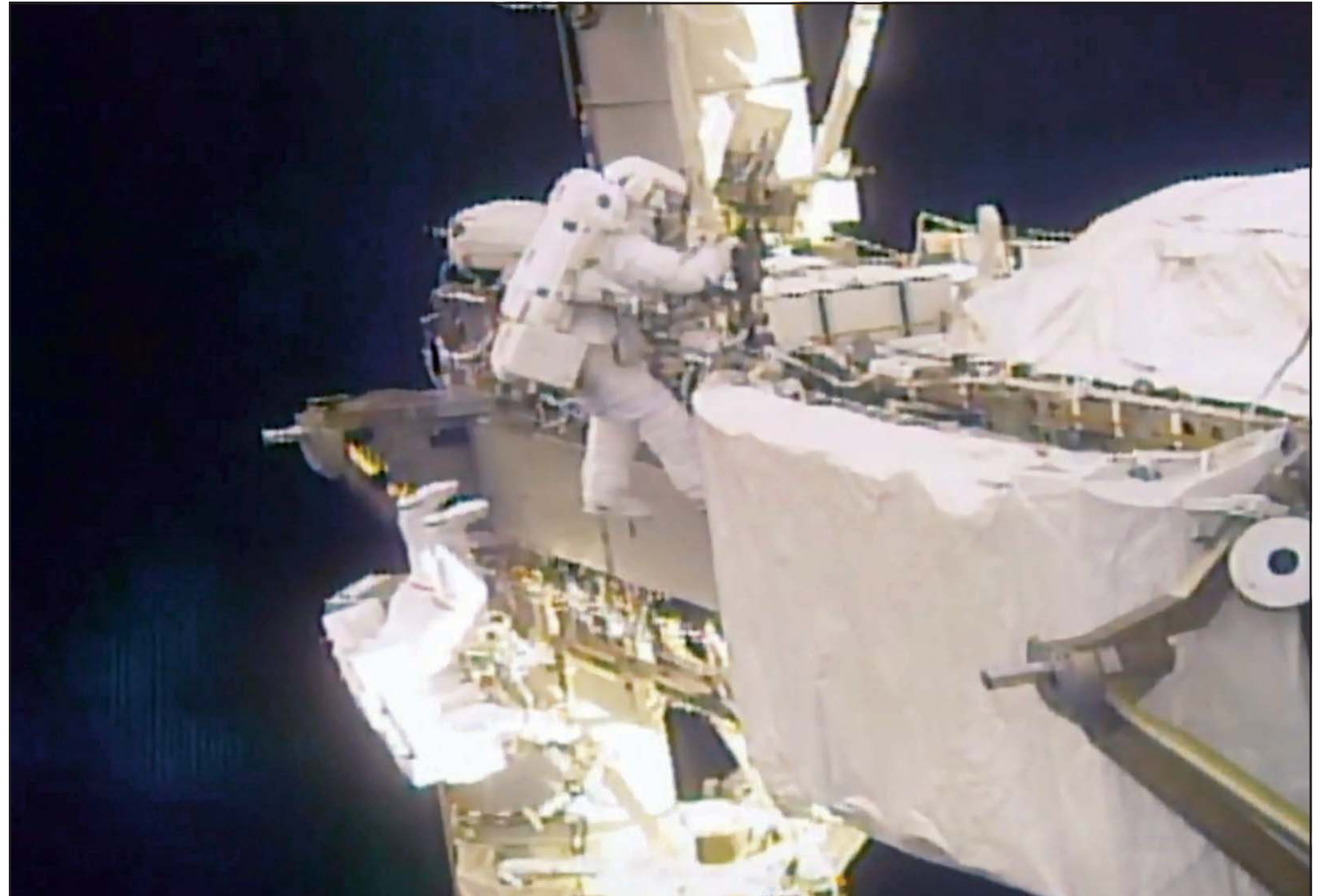
Private landowners have more than 40 homes dotting Little Cumberland, though few live there year-round. Cumberland Island is a federally protected wilderness, known for wild horses and nesting sea turtles, that attracts an estimated 60,000 visitors and campers annually.

No roads connect either island to the mainland. Landowners and the National Park Service, which manages Cumberland Island, have said they're concerned failing rockets could explode and rain down flaming debris.

Stan Austin, the Park Service's regional director in Atlanta, wrote to the FAA on Dec 10 that the spaceport plan carried "a significant risk" to Cumberland Island.

Wayne Monteith, the FAA's associate administrator for commercial space transportation, noted how close the launch site sits to the two islands in a 2019 memo that stated: "This is the closest population overflight ever proposed" for a spaceport license.

Spaceport Camden amended its license application last year, scrapping plans to fire medium-to-large rockets and saying it would instead stick to small rockets with maximum payloads of 4,400 pounds (1,995 kilograms).



In this image taken from NASA video, French astronaut Thomas Pesquet, (bottom left), and NASA astronaut Shane Kimbrough work outside the International Space Station on June 20. (AP)

Coronavirus

Dangerous new variants can undermine vaccines

Vaccine hesitancy poses risk in India

JAMSOTI, India, June 21, (AP) — In Jamsoti, a village tucked deep inside India's most populous state of Uttar Pradesh, the common refrain among the villagers is that the coronavirus spreads only in cities. The deadly infection, they believe, does not exist in villages.

So when a team of health workers recently approached Manju Kol to get vaccinated, she locked up her house, gathered her children and ran to the nearby forest.

The family hid there for hours and returned only when the workers left in the evening.

"I would rather die than take the vaccine," said Kol.

A deadly surge of coronavirus infections that ripped through India in April and May, killing more than 180,000, has tapered off and new cases have declined. But the relief could be fleeting as a significant amount of the population is still reluctant to get the shots. This has alarmed health experts who say vaccine hesitancy, particularly in India's vast hinterlands, could put the country's fragile gains against COVID-19 at risk.

"Vaccine hesitancy poses a risk to ending the pandemic in India," said retired virologist and pediatrician Dr. T. Jacob John. "The more the virus circulates, the more it can mutate into dangerous new variants that can undermine vaccines."

Complicated

Delivering vaccines in the world's second-most populous country was always going to be challenging. Even though India did relatively well at the beginning of its mammoth vaccination drive, the campaign hit a snag almost immediately due to shortages and a complicated vaccine policy, exacerbating existing inequalities.

Only less than 5% of India's people are fully immunized. Experts caution that by the end of the year, vaccination rates must go up significantly to protect most Indians from the virus that has so far already killed more than 386,000 people - a figure considered to be a vast undercount.

Starting Monday, every adult in India will be eligible for a shot paid for by the federal government. The new policy, announced last week, ends a complex system of buying and distributing vaccines that overburdened states and led to inequities in how the shots were handed out.

There is still widespread hesitancy fueled by misinformation and mistrust, particularly in rural areas where two-thirds of the country's nearly 1.4 billion population lives.

Health workers face stiff resistance from people who believe that vaccines cause impotence, serious side effects and could even kill. Some simply say they do not need the shots because they're immune to the coronavirus.

Rumors about jabs disrupting the menstruation cycle and reducing fertility have also contributed to fear and skewed the data in favor of men. In almost every Indian state, more men are getting vaccinated than women - and that gap is widening further every day.

Quashing such rumors and conspiracy theories is a tough order for many, particularly in India's tribal-dominated

SRINAGAR, India, June 21, (AP) — Sajad Hassan sat at his professor's hospital bedside for three nights, doing most of the talking as his friend and mentor breathed through an oxygen mask and struggled with a suspected COVID-19 infection.

Both were confident the 48-year-old academic would be heading home soon, until a coronavirus test came back positive and physicians ordered him moved to the isolation ward - known by many at the university hospital as the "dark room" because so few who entered came out alive.

"I could visibly see fear in his eyes," Hassan recalled.

Two days later Dr. Jibraeil was dead, one of nearly 50 professors and non-teaching staff at AMU, one of India's top universities, who fell victim to the coronavirus as it ripped through the country in April and May. AMU's tragedy was repeated across India as schools suffered similar blows to their faculty, and the loss of their knowledge - and in many cases friendship and guidance - has been devastating to the academic community.

"The virus took away our brightest minds," said Shafey Kidwai, spokesman for AMU, or Aligarh Muslim University.

One of the oldest universities in India, AMU has produced gen-

erations of politicians, jurists and scholars. The university has been the seat of modern education for many Muslims in the Indian sub-continent and an intellectual cradle for the community. It was primarily founded to educate India's Muslims, who now make up about 14% of the country's population.

Over the last two months, local newspapers and the university's Facebook page were filled with the obituaries of its professors - all lost to the pandemic.

The zoologist "touched the lives of a generation of his students." The physician was "an exceptional clinician, teacher and human being, who mentored many generations." The psychologist was a "vibrant presence" and was "known for conducting high-quality research."

And Jibraeil, an assistant professor of history who went by only one name, was a "dedicated teacher, who loved his work and cared deeply about students."

At the height of the surge, Kidwai recalled seeing colleagues carried off in ambulances to the hospital; some returning later to be buried in the over century-old campus graveyard, which ran out of space and fresh graves had to be dug over old ones.

"It was deeply harrowing," he said.

districts that have recorded disproportionately lower vaccine coverage in comparison with other districts, according to official data.

Yogesh Kalkonde, a public health doctor in Gadchiroli, a tribal area in the western state of Maharashtra, said his district was overrun with the belief that the vaccine is more dangerous than the virus.

Some in the area have raised the untrue claim that the shots can cause infertility, Kalkonde said. Others simply question its effectiveness.

"We have to convince people, go door to door, and rely on people who have taken the vaccine to spread the word," he said. "It's an extremely slow process."

There is some pushback. State governments have mounted aggressive awareness campaigns through posters and radio announcements to allay some of the anxiety and confusion. Some local administrations have started giving rides to vaccination centers, especially from remote villages. Volunteers are conducting door-to-door surveys and even small rallies to encourage people to get the jab.

For months, Vibha Singh, a government-appointed nurse, has gone door-to-door in the villages of Uttar Pradesh.

"People tell us to leave or they would beat us," said Singh. "Sometimes they also throw stones and bricks at us."

Prime Minister Narendra Modi and

other leaders have routinely spoken about the need to shun vaccine hesitancy, but health experts say more needs to be done.

"We need to explain it clearly to people, ideally through local trusted networks," said K. Srinath Reddy, president of the Public Health Foundation of India. He said state governments should bolster local self-help groups, village councils and ask local religious leaders to step in.

"It requires a conversation, not just top-down messaging," he said.

Dr. Vinod K. Paul, head of the country's COVID-19 task force, acknowledged the immediate need to address the problem but said public participation to dispel rumors and misinformation was important.

"It is the responsibility not only of the government but also the society as a whole to create such an environment in which an unfounded hesitancy is addressed," said Paul.

Virologists and public health experts say eradicating doubts about the vaccine in rural India and inoculating people quickly should be of paramount importance since the majority of Indians live in the hinterlands. Already, urban dwellers are getting the shots much faster.

"If they are protected, much of India will be protected," Reddy said of rural areas. "Their vulnerability to a sweeping pandemic is much, much more. So vaccinating them quickly must be a priority."



Health workers Neeraj, (third right), and Aradhna take nasal sample of a woman for COVID-19 test at Jamsoti Village, in Chandauli district, Uttar Pradesh state, India, on June 8. India's vaccination efforts are being undermined by widespread hesitancy and fear of the jobs, fueled by misinformation and mistrust. That's especially true in rural India, where two-thirds of the country's nearly 1.4 billion people live. (AP)

Discovery

Heat deaths tied to warming: More than one-third of the world's heat deaths each year are due directly to global warming, according to the latest study to calculate the human cost of climate change.

But scientists say that's only a sliver of climate's overall toll - even more people die from other extreme weather amplified by global warming such as storms, flooding and drought - and the heat death numbers will grow exponentially with rising temperatures.

Dozens of researchers who looked at heat deaths in 732 cities around the globe from 1991 to 2018 calculated that 37% were caused by higher temperatures from human-caused warming, according to a study Monday in the journal *Nature Climate Change*. That amounts to about 9,700 people a year from just those cities, but it is much more worldwide, the study's lead author said.

"These are deaths related to heat that actually can be prevented. It is something we directly cause," said **Ana Vicedo-Cabrera**, an epidemiologist at the Institute of Social and Preventative Medicine at the University of Bern in Switzerland.

The highest percentages of heat deaths caused by climate change were in cities in South America. Vicedo-Cabrera pointed to southern Europe and southern Asia as other hot spots for climate change-related heat deaths.

Sao Paulo, Brazil, has the most climate-related heat deaths, averaging 239 a year, researchers found.

About 35% of heat deaths in the United States can be blamed on climate change, the study found. That's a total of more than 1,100 deaths a year in about 200 US cities, topped by 141 in New York. Honolulu had the highest portion of heat deaths attributable to climate change, 82%.

"People continue to ask for proof that climate change is already affecting our health. This attribution study directly answers that question using state-of-the-science epidemiological methods, and the amount of data the authors have amassed for analysis is impressive," said **Dr. Jonathan Patz**, director of the Global Health Institute at the University of Wisconsin. (AP)

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Mayflower returns to England: The Mayflower had a few false starts before its trailblazing sea voyage to America more than 400 years ago. Now, its artificial intelligence-powered namesake is having some glitches of its own.

A sleek robotic trimaran retracing the 1620 journey of the famous English vessel had to turn back Friday to fix a mechanical problem.

Nonprofit marine research organization ProMare, which worked with IBM to build the autonomous ship, said it made the decision to return to base "to investigate and fix a minor mechanical issue" but hopes to be back on the trans-Atlantic journey as soon as possible.

With no humans on board the ship, there's no one to make repairs while it's at sea.

Piloted by artificial intelligence technology, the 50-foot (15-meter) Mayflower Autonomous Ship began its trip early Tuesday, departing from Plymouth, England, and spending some time off the Isles of Scilly before it headed for deeper waters.

It was supposed to take up to three weeks to reach Provincetown on Cape



Patz



Cabrera

Cod before making its way to Plymouth, Massachusetts. If successful, it would be the largest autonomous vessel to cross the Atlantic.

There is some historical precedent for the malfunction: The original Mayflower that carried Pilgrim settlers to New England was supposed to set sail in the summer of 1620 but twice turned back to England because of a leaking problem affecting its sister ship, the Speedwell. (AP)