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Europe's JUICE spacecraft ready to explore Jupiter's icy moons

First European space mission to venture into outer solar system

TOULOUSE, France: Europe's JUICE spacecraft is all ready to embark on an eight-year odyssey through the Solar System to find out whether the oceans hidden under the surface of Jupiter's icy moons have the potential to host extraterrestrial life. For now, the Jupiter Icy Moons Explorer (JUICE) is in a white room of its manufacturer Airbus in the southwestern French city of Toulouse. But its days on this planet are numbered.

Soon the spacecraft will be put in a container, wings carefully folded away, ahead of travelling to Europe's spaceport in Kourou, French Guiana off the coast of South America in early February. From there, one of Europe's most ambitious space missions ever is scheduled to launch in April. The scientists and engineers in Toulouse who have spent years working on the project are clearly emotional at the thought of saying goodbye to what they call "the beast".

They finally unveiled the six-ton spacecraft to journalists on Friday - showing off its 10 scientific instruments, antenna 2.5 m in diameter for communicating with Earth, and vast array of solar panels which still need to be tested one last time. As a parting gift, a commemorative plaque was mounted on the back of the spacecraft in tribute to Italian astronomer Galileo Galilei, who was the first to spot Jupiter and its largest moons in 1610.

Volcanic Io and its icy siblings Europa, Ganymede and Callisto were "the first moons discovered outside of our own", said Cyril Cavel, the Airbus project manager for JUICE. Cavel carried a copy of Galileo's "Sidereus Nuncius", the first treatise based on observations made through a telescope. More than 400 years later, JUICE will give a far clearer image of Europa, Ganymede and Callisto, before becoming the first spacecraft to orbit around one of Jupiter's moons.

Earth is 'like a catapult'

It will be the first European space mission that ventures into the outer solar system, which begins beyond Mars. Jupiter is more than 600 million km from Earth and JUICE will take a circuitous path before its scheduled arrival in July 2031. The spacecraft will travel a total of two billion kilometers, using the gravity of Earth - then Venus - for a boost along the way. "It's like a catapult that gives us momentum to Jupiter," said Nicolas Altobelli, JUICE project scientist at the European Space Agency (ESA).

The extra travel time will allow JUICE's solar panels - which cover an area of 85 sq m, the largest ever built for an interplanetary spacecraft - to soak up as much power as possible. It will need that power once it crosses the "frost line" between Mars and Jupiter, when temperatures could drop to minus 220 degrees Celsius. Then JUICE will need to carefully hit the brakes so it can slip into Jupiter's orbit. For that part, it's on its own.

"We will follow the maneuver from Earth without being able to do anything - if it fails, the mission is lost," Cavel said. From Jupiter's orbit, the satellite will make 35 flybys of Europa, Ganymede and Callisto. Then it will enter the orbit of Ganymede, the largest of the three, before eventually falling to its surface.

Not looking for 'big fish'

JUICE's ice-penetrating cameras, sensors, spectrometers and radars will probe the moons to determine whether they could be habitable to past or present life. It will not be looking at the frozen surface of the moons but 10-15 km below, where vast liquid oceans flow. This extreme environment could be home to bacteria and single-celled organisms.

But the mission will not be able to detect "big fish, or creatures," ESA director-general Josef Aschbacher said. Instead it will look for conditions capable of supporting life, including liquid water and



TOULOUSE: The ESA's (European Space Agency) 'JUICE' probe is unveiled for the media on Jan 20, 2023, a few days ahead of its departure to Kourou space center. —AFP

a source of energy, which could come from the tidal effect Jupiter's gravity has on its moons. Measuring magnetic signals could determine whether water on Ganymede is in contact with its rocky core, which would allow chemical elements necessary for life "to be dissolved into the water," Altobelli said.

NASA's Clipper mission is planned to launch in

2024 on its own quest to study Europa. If one of the moons prove to be a particularly good candidate to host life, the "logical next step" would be to send a spacecraft to land on the surface, Cavel said. He added that he was moved at the thought that JUICE "will end its life on the surface of Ganymede". —AFP

Finland says must consider joining NATO without Sweden

HELSINKI: Finland said for the first time Tuesday that it had to consider joining NATO without Sweden, whose bid appeared to grind to a halt as Ankara blasted Stockholm over anti-Turkey protests. Finland - which shares a 1,300-kilometre (800-mile) border with Russia - and Sweden applied to join NATO last year after Moscow's invasion of Ukraine, ending decades-long policies of military non-alignment.

"We have to assess the situation, whether something has happened that in the longer term would prevent Sweden from going ahead," Foreign Minister Pekka Haavisto told broadcaster Yle. He added however that it was "too early to take a position on that now" and that a joint application remained the "first option".

Sweden's Foreign Minister Tobias Billstrom told media on Tuesday that he was "in contact with Finland to find out what this really means". Haavisto later clarified his comments at a press conference, saying he did not want to "speculate" on Finland joining alone "as both countries seem to be making progress", and emphasizing their commitment to a joint application. But "of course, somewhere in the back of our minds, we are thinking about different worlds where some countries would be permanently barred from membership", he said.

The Danish-Swedish far-right politician Rasmus Paludan set fire to a copy of the Holy Quran on Saturday in front of Turkey's embassy in the Swedish capital, angering Ankara and Muslim countries around the world. "Sweden should not expect support from us for NATO," Turkey's President

Recep Tayyip Erdogan said Monday.

"It is clear that those who caused such a disgrace in front of our country's embassy can no longer expect any benevolence from us regarding their application for NATO membership," Erdogan said. Swedish leaders have roundly condemned the Holy Quran burning but defended their country's broad definition of free speech.

The incident came just weeks after a support group for armed Kurdish groups in Syria, the Rojava Committee, hung an effigy of Erdogan by the ankles in front of Stockholm City Hall, sparking outrage in Ankara.

Haavisto said the anti-Turkey protests had "clearly put a brake on the progress" of the applications by Finland and Sweden to join the trans-Atlantic military alliance. "My own assessment is that there will be a delay, which will certainly last until the Turkish elections in mid-May", Haavisto said.

'Plan B' out in the open

Turkey has indicated in recent months that it has no major objections to Finland's entry into NATO. Helsinki had refused until now to speculate on the option of joining without Sweden, emphasizing the benefits of joint membership with its close neighbor.

But "frustration has grown in various corners of Helsinki", and "for the first time it was said out loud that there are other possibilities", Matti Pesu, a researcher at the Finnish Institute of International Affairs, told AFP. "There has been a change" in the Finnish position, he said. "These Plan Bs are being said out loud."

Haavisto also accused the protesters of "playing with the security of Finland and Sweden", with actions that "are clearly intended to provoke Turkey". "We are on a very dangerous path because the protests are clearly delaying Turkey's willingness and ability to get this matter through parliament," he said. — AFP

The defense ministry announced the resignation of Shapovalov, who was in charge of the army's logistical support, on the heels of accusations it was signing food contracts at inflated prices. Local media reports last week accused the ministry of having signed a deal at prices "two to three times higher" than current rates for basic foodstuffs. In a statement, the ministry insisted the accusations were "unfounded and baseless" but said Shapovalov's departure would "preserve the trust of society and international partners".

Tymoshenko, who has worked with Ukraine's President Volodymyr Zelensky since his election in 2019 and oversaw regional policy, also announced his resignation Tuesday. He posted a photo of himself holding a handwritten resignation letter, thanking the president for the "opportunity to do good deeds every day and every minute".

Tymoshenko was implicated in several scandals during his tenure, including in October last year when he was accused of using a car donated to Ukraine for humanitarian purposes. The dismissal of Symonenko, a deputy prosecutor general, comes after media reports that he spent a holiday in Spain this winter, reportedly using a car belonging to a Ukrainian businessman. — AFP

Several top Ukraine officials quit amid corruption claims

KYIV: Several senior Ukrainian officials announced their resignations Tuesday as the defense ministry was shaken by accusations of food procurement fraud, in the country's largest corruption scandal since the start of Russia's invasion.

Ukraine has a history of endemic corruption, including among the political elite, but efforts to stamp out graft have been overshadowed by Moscow's full-scale war that began in February. Kyiv's Western allies, which have allocated billions of dollars in financial and military support, have been pushing for anti-corruption reforms for years, sometimes as a precondition for aid.

Ukraine's deputy defense minister Vyacheslav Shapovalov, the deputy head of the presidential administration Kyrylo Tymoshenko and deputy prosecutor general Oleksiy Symonenko were among the officials who stood down.

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