'No need to panic' as sunspot with potential for solar flares doubles in size overnight, scientists say

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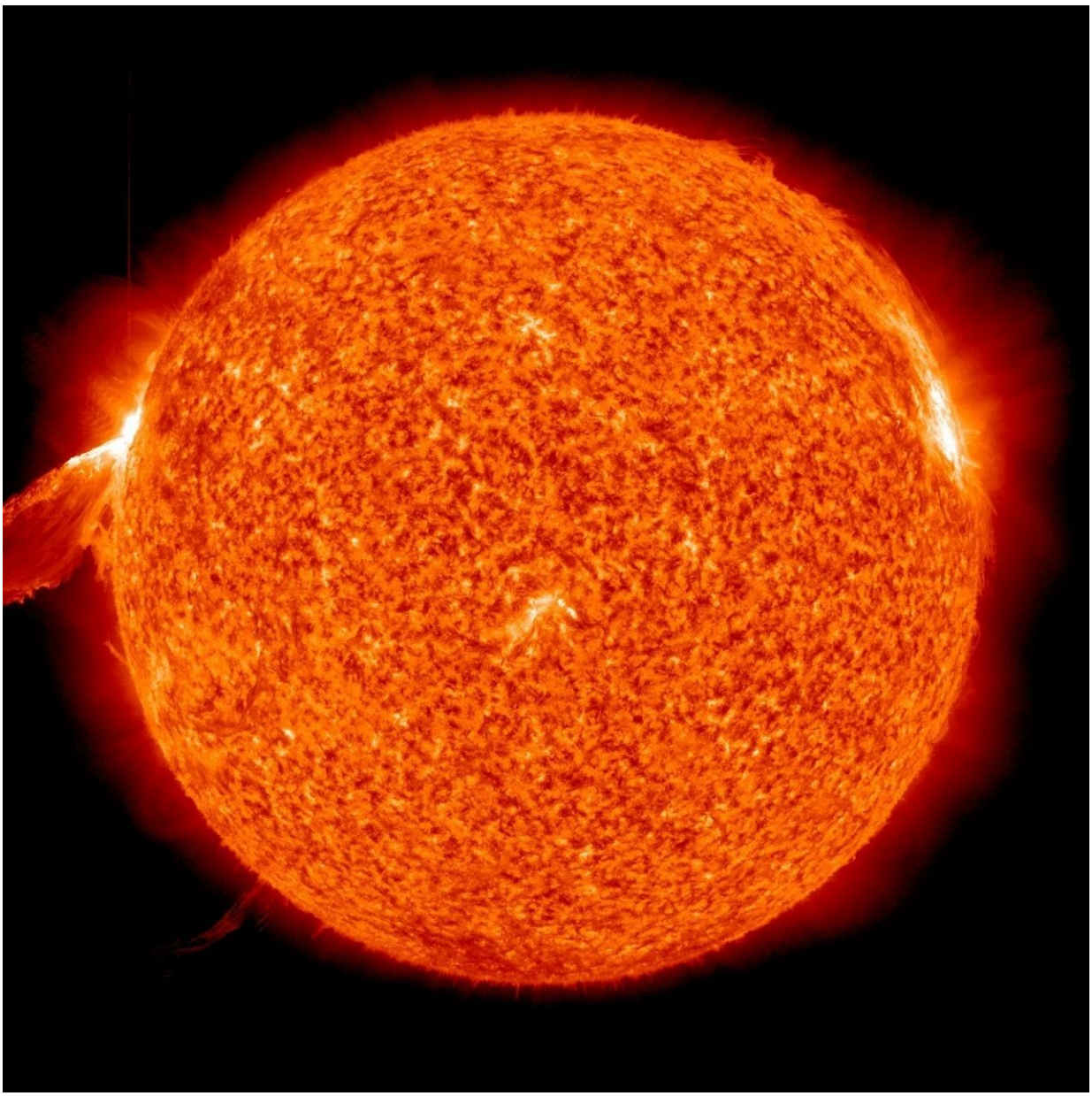

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A sunspot pointing toward Earth has the potential to cause solar flares, but experts told USA TODAY it's far from unusual and eased concerns over how flares would affect the Blue Planet.

Active Region 3038, or AR3038, has been growing over the past week, said Rob Steenburgh, acting lead of the National Oceanic and Atmospheric Administration's Space Weather Forecast Office.

"This is what sunspots do," he said. "Over time, generally, they'll grow. They go through stages, and then they decay."

Sunspots appear darker because they are cooler than other parts of the sun's surface, according to NASA. Sunspots are cooler because they form where strong magnetic fields prevent heat within the sun from reaching its surface.

"I guess the easiest way to put it is that sunspots are regions of magnetic activity," Steenburgh said.

Solar flares, which typically rise from sunspots, are "a sudden explosion of energy caused by tangling, crossing or reorganizing of magnetic field lines near sunspots," NASA said.

"You can think of it like the twisting of rubber bands," Steenburgh said. "If you have a couple of rubber bands twisting around on your finger, they eventually get twisted too much, and they break. The difference with magnetic fields is that they reconnect. And when they reconnect,

it's in that process that a flare is generated."

The larger and more complex a sunspot becomes, the higher the likelihood is for solar flares, Steenburgh said.

The sunspot has doubled in size each day for the past three days and is about 2.5 times the size of Earth, C. Alex Young, associate director for science in the Heliophysics Science Division at NASA's Goddard Space Flight Center, said in an email.

Young said the sunspot is producing small solar flares but "does not have the complexity for the largest flares." There is a 30% chance the sunspot will produce medium-sized flares and a 10% chance it will create large flares, he said.

W. Dean Pesnell, project scientist of the Solar Dynamics Observatory, said the sunspot is a "modest-sized active region" that "has not grown abnormally rapidly and is still somewhat small in area."

"AR 3038 is exactly the kind of active region we expect at this point in the solar cycle," he said.

Andrés Muñoz-Jaramillo, lead scientist at the SouthWest Research Institute in San Antonio, said the sunspot is nothing for people on Earth to worry about.

"I want to emphasize there is no need to panic," he said. "They happen all the time, and we are prepared and doing everything we can to predict and mitigate their effects. For the majority of us, we don't need to lose sleep over it."

Solar flares have different levels, Muñoz-Jaramillo said. The smallest are A-class flares, followed by B, C, M and X at the highest strength. Within

each letter class is a finer scale using numbers, and the higher numbers denote more intensity.

C flares are too weak to noticeably affect Earth, Muñoz-Jaramillo said. More intense M flares may disrupt radio communication at Earth's poles. X flares can disrupt satellites, communication systems and power grids and, at their worst, cause electricity shortages and power outages.

Lower-intensity solar flares are pretty common; X flares are less so, Steenburgh said. In a single solar cycle, about 11 years, there are typically about 2,000 M1 flares, about 175 X1 flares and about eight X10 flares, he said. For the largest solar flares at X20 or above, there is less than one per cycle. This solar cycle began in December 2019.

The AR3038 sunspot has caused C flares, Steenburgh said. Although there have been no M or X flares from this area, he said there is a potential for more intense flares in the next week or so.