Come explore with us! Roughly every 11 years, the sun goes from a quiet period to one full of solar fireworks In mid-February 2024, NASA’s Solar Dynamics Observatory captured these images of an X-class solar flare. The teal, yellow and red images show three different types of extreme ultraviolet light that highlight the extremely hot material in flares. NASA/SDO By Adam Mann April 8, 2024 at 6:30 am The sun is the closest star to Earth. That gives all Earthlings, especially astronomers, a front-row seat to its activities. One of the most striking features of the sun’s activity is what astronomers call the solar cycle. This is an epic rise and fall in the sun’s level of activity that repeats every 11 years or so. Astronomers owe the discovery of the solar cycle to sunspots. Ever since Galileo first pointed a telescope at the sun in 1610, people have witnessed the occasional emergence of these dark splotches on the sun. As the sun rotates, completing one spin every 27 days, those spots appear to move across our star’s surface. Heinrich Schwabe regularly tracked sunspots from 1826 to 1843. This German astronomer is credited with discovering that sunspots’ frequency tends to vary every 11 years. During the most active time — or maximum — of this 11-year cycle, dozens of sunspots can be seen slowly crossing the sun at a time. At the least active point in the solar cycle — the solar minimum — our star may be sunspot-free. Over the years, research has linked sunspots and the solar cycle to the sun’s magnetic field. Much like Earth, the sun has a magnetic field with a North Pole and a South Pole. But the sun’s magnetic field is at least 100 times as strong as Earth’s. It’s also much larger and more complex. Weekly updates to help you use Science News Explores in the learning environment Thank you for signing up! There was a problem signing you up. The sun is a huge ball of super-hot gas. Temperatures within the sun are so high that electrons get ripped away from the cores, or nuclei, of their atoms. This creates a swarm of negatively charged electrons and positively charged nuclei. Such charged particles are known as ions. As ions move around inside the sun, they create swirling magnetic fields. Those fields twist and turn, churning as the sun rotates. Sometimes, magnetic field lines come together and create points with extra-powerful magnetism. At the sun’s surface, those spots of intense magnetism cool off the surrounding gas, making sunspots appear. The overall surface of the sun roils at roughly 5,500 degrees Celsius, (10,000 degrees Fahrenheit). Sunspots look so dark because they are much cooler — only around 3,500 ºC (6,300 ºF).