

The December 21, 2020 “Great Conjunction” of Jupiter and Saturn

During the northern hemisphere summer of 2020, Jupiter and Saturn will become visible in our evening skies. Earth will approach closest to both these gas-giant planets in July – something astronomers call [planetary opposition](#). By autumn, the 2 planets will appear to be on a slow collision course with each other in the constellation Sagittarius. But it’s in December that this very close alignment of Jupiter and Saturn reaches its culmination.

The “great conjunction” of Jupiter and Saturn will occur on December 21, 2020 – the northern hemisphere’s winter solstice. At that time, the two planets will be in the constellation Capricornus, low toward the southwest horizon, and separated by a mere 0.1° . This will be the closest Jupiter/Saturn conjunction since the year 1623 CE! Jupiter will be at magnitude -2.0, and significantly dimmer Saturn at magnitude +0.6.

On the evenings of December 16 & 17, 2020, the waxing crescent Long Night moon will join Jupiter and Saturn, making an amazing sight in the southwestern twilight.



Above: Artist's concept of Jupiter and Saturn on December 16, 2020 shortly after sunset, as viewed from Earth's surface. Notice that a 7% illuminated, waxing crescent moon will also be part of this early evening view. Jupiter and Saturn will be rather low in the SW sky – only about 17° above the horizon in Asheville, NC.

Chart via Jay Ryan at <http://classicalastronomy.com/>.

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A “**great conjunction**” is a conjunction of the planets Jupiter and Saturn. Great conjunctions occur regularly, about every 20 years, due to the combined effect of Jupiter's approximately 12-year orbital period and Saturn's approximately 30-year orbital period. As it travels around the Sun, Jupiter catches and moves past slower orbiting Saturn – in a [somewhat regular 20-year pattern](#).

Jupiter and Saturn last aligned in a great conjunction in May 2000.

After this December 21, 2020 conjunction, the two planets will appear to trade positions, as Jupiter overtakes Saturn. Jupiter will progress to the east and draw farther and farther away from Saturn throughout the decade of the 20s. After that, the two planets will approach each other through the 2030s, reaching conjunction again in November 2040. Beyond that, Jupiter-Saturn conjunctions will occur in April 2060, March 2080, and September 2100.



Above: Jupiter and Saturn (and some of their moons) will be close enough to easily fit within the same field-of-view of a telescope eyepiece (simulated above), but you may also view the two planets with a pair of binoculars or with your unaided eyes. The planets’ angular separation of a mere 6 arcminutes (0.1°) is only one fifth the diameter of the Moon.

The above chart simulation was created using PowerPoint and SkySafari software app.

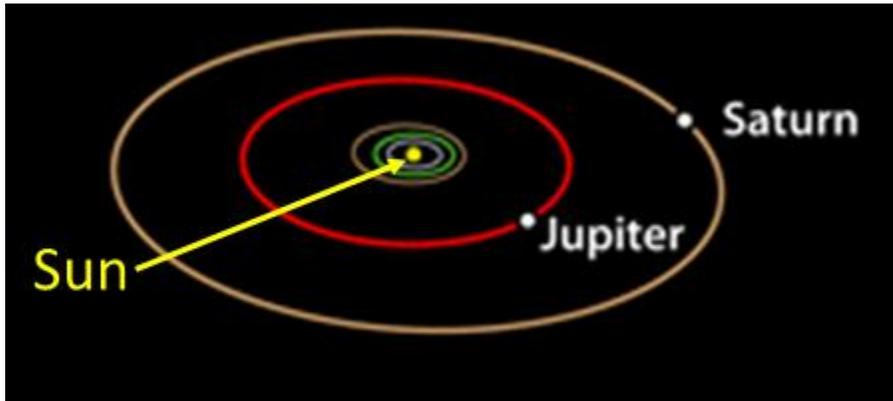
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How Jupiter “Laps” Saturn Every 20 Years

Each Earth year, **Saturn** completes about **12°** of its counterclockwise orbit, around the Sun along the ecliptic ($360^\circ \div$ its orbital period of 29.5 Earth years); whereas **Jupiter**, on its speedier “inside lane”, completes approximately **30°** for each Earth year ($360^\circ \div$ its orbital period of 11.9 Earth years).

Therefore, in one Earth year, Jupiter closes the gap between itself and Saturn by about **18°** ($30^\circ - 12^\circ = 18^\circ$). So, in a period of 20 Earth years, Jupiter has orbited around for another pass of Saturn along the ecliptic ($360^\circ \div 18^\circ \text{ per yr.} = 20 \text{ years}$), thereby lapping the ringed planet once every 2 decades.



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