Section of the waxing gibbous moon when it is four days past first quarter.

Our Moon

Apparent Diameter: 30 arc minutes = 1800 arc seconds
True Diameter: 2160 miles
Average distance from Earth: 240,000 miles

The curved line represents the edge of the field of view as seen through a low-powered (50x) telescope

The Need for Telescopes

Our solar system is very large and the planets are very far away. So far away that, even though some of them are much larger than the Earth, their angular sizes are quite small. As a result, they always appear star-like to the unaided eye. A telescope is required to magnify their pinpoint appearances making them visible as small disks for study. Magnifications of greater than 100x are often needed.

We all know how large the moon appears in our sky. While Venus, the planet that approaches closest to the Earth, has a true diameter of over three times that of the moon, it is always at least 108 times farther away. Consequently, its small angular size is comparable to the apparent sizes of the larger lunar craters. The other planets appear even smaller.

	Apparent Diameter in the sky (arc seconds)	Actual Diameter (miles)	Distance at closest approach (miles)
Mercury (closest)	10	3025	57 million
Venus (closest)	60	7500	26 million
Earth	---	7900	---
Moon	1800	2160	220000
Mars (closest)	25	4200	35 million
Jupiter	47	88000	390 million
Saturn (planet)	19	75000	794 million
Saturn (rings)	40	155000	794 million

Compare the relative apparent size of the moon (at left) with those of the bright planets of our solar system.

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Lunar and Jupiter images courtesy of James Sweeney, Delaware Valley Amateur Astronomers; Mars and Saturn images courtesy of James Melka, St. Louis Astronomical Society; Design by John Jardine Goss, Roanoke Valley Astronomical Society