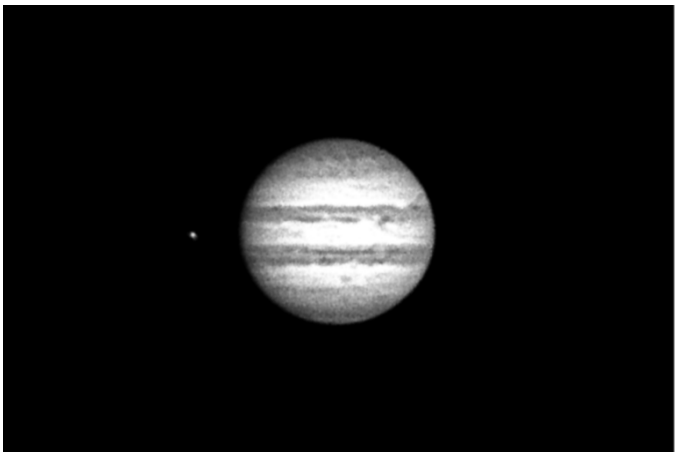
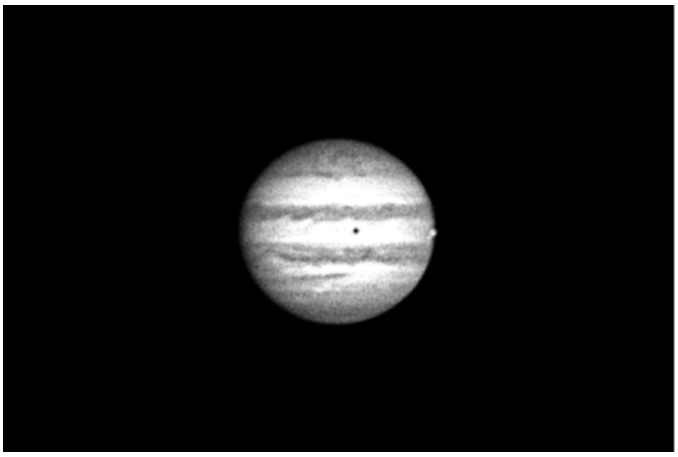
Jovian System Dynamics Come Alive!

By Greg Morgan

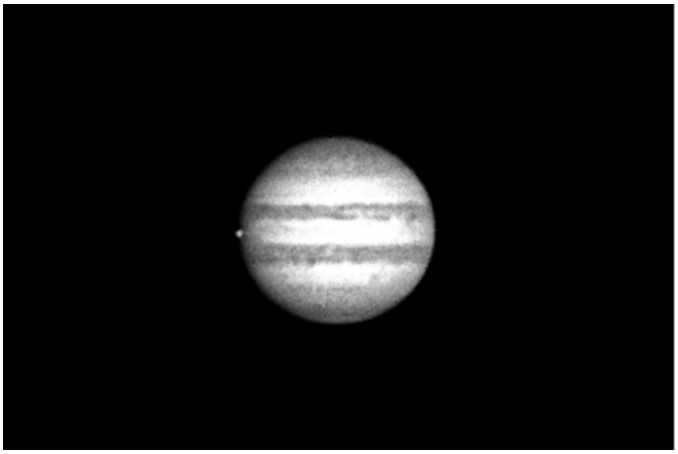
The following six frames were taken from a series of 3,227 images shot of Jupiter over a time window of 4.2 hours. The images were taken with the CSU Fresno Campus Observatory 16" LX200 at f/38 and an SBIG ST-10XME CCD camera by Greg Morgan and Fred Ringwald on 3/25/03. Jupiter rotated about 150 degrees during this series. Io made a transit of Jupiter's 42 arcsecond disk casting its inky black shadow onto Jupiter's swirling cloud tops. Europa entered the field of view near the end of the sequence. The Great Red Spot crossed Jupiter's central meridian just after the egress of Io's shadow. Many frames were assembled into a movie that allowed the Jovian system dynamics to come alive!



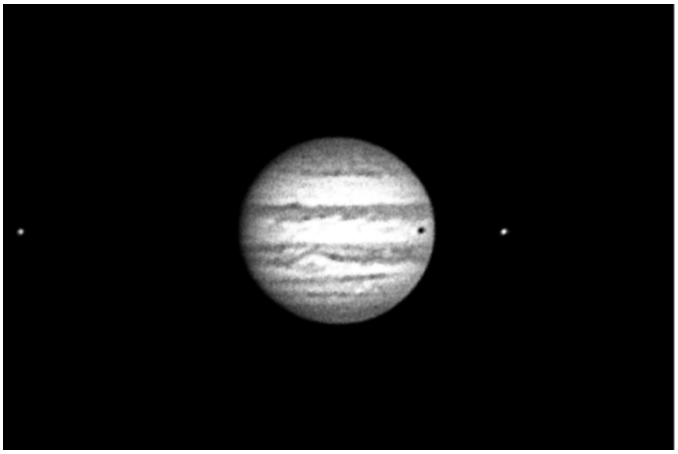
Frame 1: Elapsed time = 0:00. Io is the moon seen on the left. It is moving to the right. The GRS is on the far side of Jupiter.



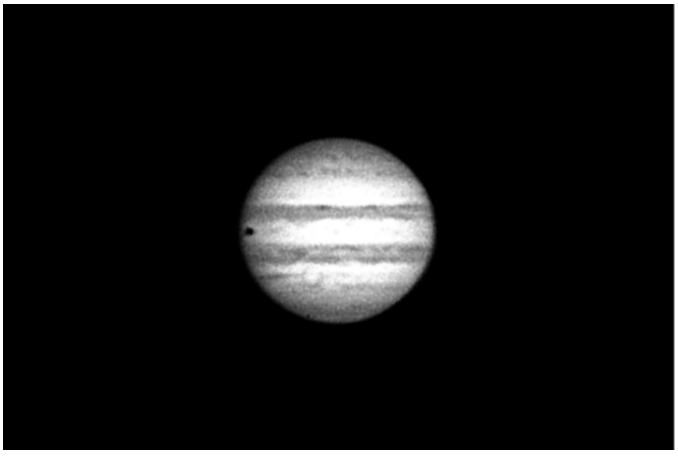
Frame 4: Elapsed time = 2:45. Io is making its transit egress. Io's shadow has crossed the meridian. The GRS is just visible.



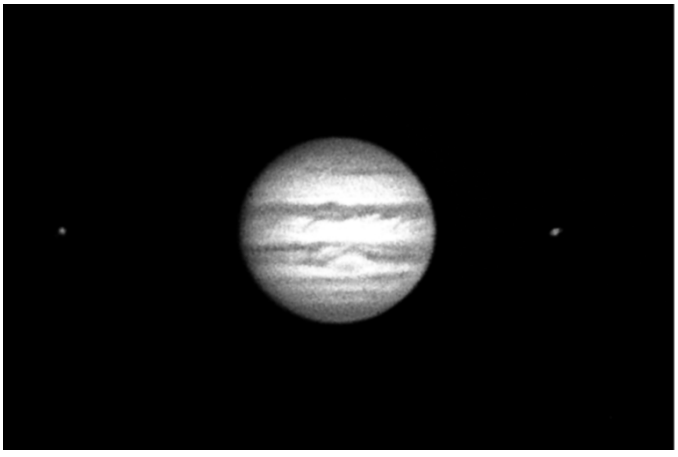
Frame 2: Elapsed time = 0:32. Io is now on Jupiter's limb beginning to make its transit ingress. Pick out some landmarks on Jupiter's surface to observe its rotation.



Frame 5: Elapsed time = 3:33. Europa has appeared at the left. A line between the shadow and Io points in the direction of the sun. The GRS is fast approaching Jupiter's central meridian.



Frame 3: Elapsed time = 1:38. Io is near Jupiter's central meridian; washed out by the planets glare. Io's shadow appears.



Frame 6: Elapsed time = 4:12. The GRS has crossed Jupiter's central meridian.