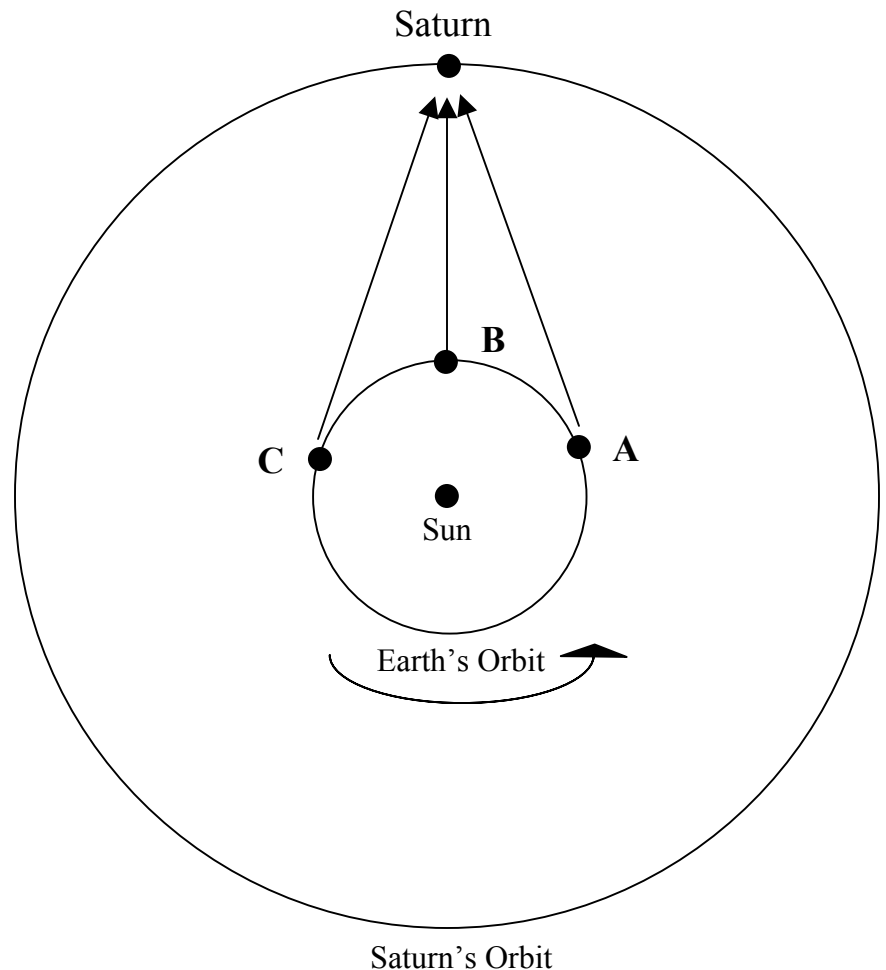
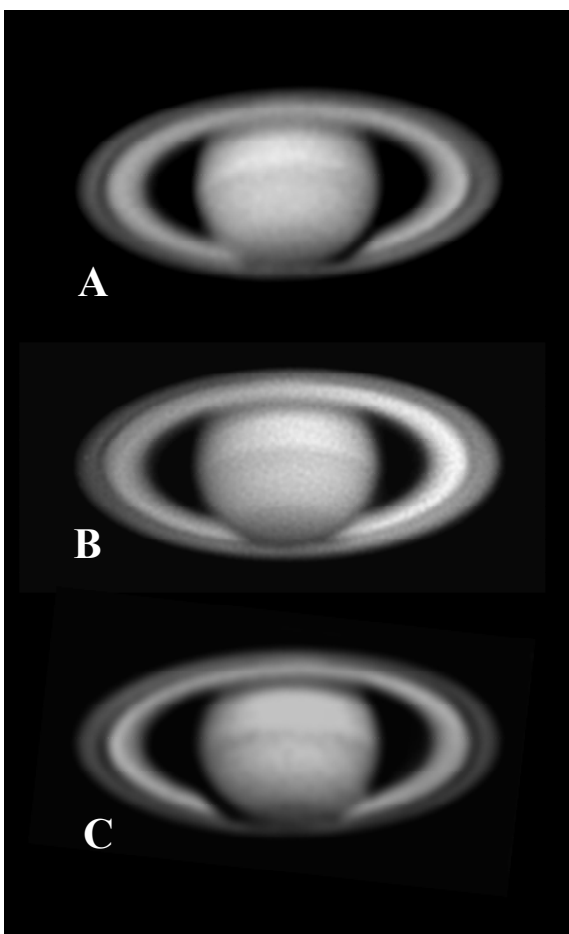


# Observing Saturn's Shadow-Dance:

By Greg Morgan

As the Earth orbits the Sun, we have the opportunity to watch Saturn's shadow. At position **A**, Saturn can be seen in the eastern sky just before sunrise. The Sun, Earth and Saturn's positional relationship can be seen in figure 2 below. The middle of the observing season is marked by Saturn's opposition, at point **B**. At this time, Saturn is crossing the meridian at about midnight. Later, as the Earth moves toward position **C**, Saturn can be seen in the western sky after sundown. Saturn's position along its orbit during our observing season doesn't really change very much. Saturn, of course, continuously casts a distinct shadow onto its rings creating an area of sharp contrast easily seen with small telescopes. The images in figure 1 show where the shadow falls. From our perspective at position **A**, we see the shadow on one side of the planet. As the Earth moves to opposition at point **B**, the shadow disappears behind Saturn. Then, as the Earth progresses toward position **C**, the shadow re-appears on the other side of the planet. Saturn passed opposition on December 17, 2002. Be sure to watch Saturn over the next few months. As the shadow emerges, it will grow larger and larger as the Earth orbits toward position **C**.

**Figure 1:** Three views of Saturn showing the apparent positional change of the planet's shadow. Image **A** was taken 9/26/02 toward the east just before sunrise. Image **B** was taken 12/9/02 at midnight as Saturn was near the zenith crossing the meridian just days prior to opposition. Image **C** was taken 2/22/02 toward the west just after sunset. Image **A** and **C** were taken by Greg Morgan with the 10 inch SCT at f/45 using eyepiece projection with Randy Steiner's 12.4mm eyepiece. Image **B** was taken by Greg Morgan and Fred Ringwald with eyepiece projection and the Fresno State Campus Observatory 16 inch LX200 SCT operating at f/59!



**Figure 2:** Above and right. The orbits of the Earth and Saturn are shown (not to scale). With the Earth at position **A**, our view of Saturn corresponds to image **A**. At opposition, point **B**, the shadow is hidden by the planet. Later in the observing season, at position **C**, the shadow emerges on the opposite side of the planet.