



# Barry Lawrence Ruderman Antique Maps Inc.

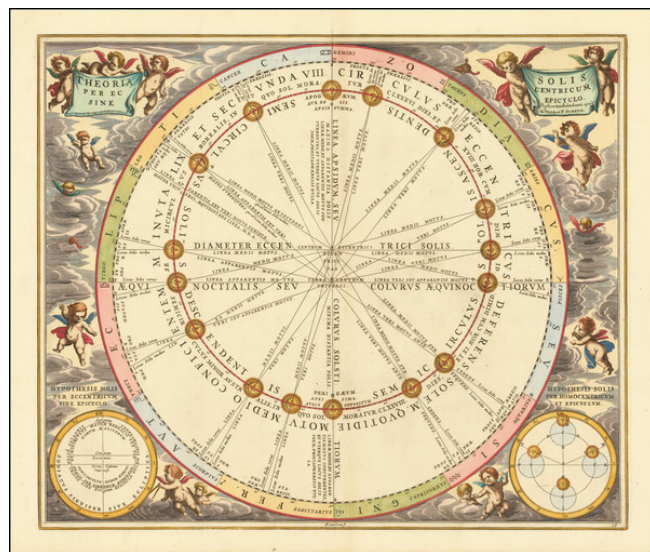
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## Theoria Solis Per Eccentricum Sine Epicyclo

**Stock#:** 65801op  
**Map Maker:** Cellarius  
**Date:** 1708  
**Place:** Amsterdam  
**Color:** Hand Colored  
**Condition:** VG+  
**Size:** 20 x 17 inches  
**Price:** Not Available



### Description:

Fine example of this celestial chart illustrating the Sun's orbit around the Earth, from Andreas Cellarius' *Harmonia Macrocosmica*.

Cellarius's chart illustrates the Ptolemaic theory of the Sun's orbit around the Earth. The chart is designed to explain the differences between the observed interval between the length of time from the Autumnal to the Vernal equinox (187 days) and the length of time from the Vernal equinox to the Autumnal equinox (178 days). This is, of course, due to the eccentricity of the earth's orbit and the varying speed at which the earth circles the sun.

The classical Greek explanation for this phenomenon was that the sun's geocentric orbit was off-centered from the earth, a feature which is shown here at five times in exaggeration. This allows for the earth to spend more time orbiting the sun during the northern hemisphere winter, when the earth both has further to travel and has a slower velocity (as it is further from the sun, therefore has more potential energy).

The map helpfully provides a number of reference lines, two of which are particularly important. The horizontal *Aequinoctialis* runs through the center of the earth, and shows the (supposed) location of the equinoxes, and the vertical *Linea Apsidum*, which shows the location of the solstices. It should be noted that while this theory is correct for explaining the differing lengths of the orbit, the exact position of the equinoxes and solstices is not necessarily correct, as this is also influenced by the earth's axial tilt.

The Greek geometer Apollonius of Solga showed that there are actually two mathematically equivalent



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solutions (under a coordinate change) for this issue. The first, as presented in the main figure, is repeated in the lower left and only requires an off-centered and elliptical orbit. The second solution, shown in the lower right, is that the sun orbits a secondary, fictional point that itself orbits the earth in a perfectly circular fashion; this is termed an epicycle.

#### **States**

There are 3 states of the charts:

- 1660: No page numbers. Some maps include the name of Johannes Van Loon as the engraver.
- 1661: Page numbers added in the bottom right corner. Some maps include the name of Johannes Van Loon as the engraver.
- 1708: Valk & Schenk imprint added.

#### **Detailed Condition:**