

*Almagest, Book XII (H450-1)*  
**On Calculating Stationary Points**

In the definition of this kind of problem, there is a preliminary lemma demonstrated (for a single anomaly, that related to the sun) by ... Apollonius ....

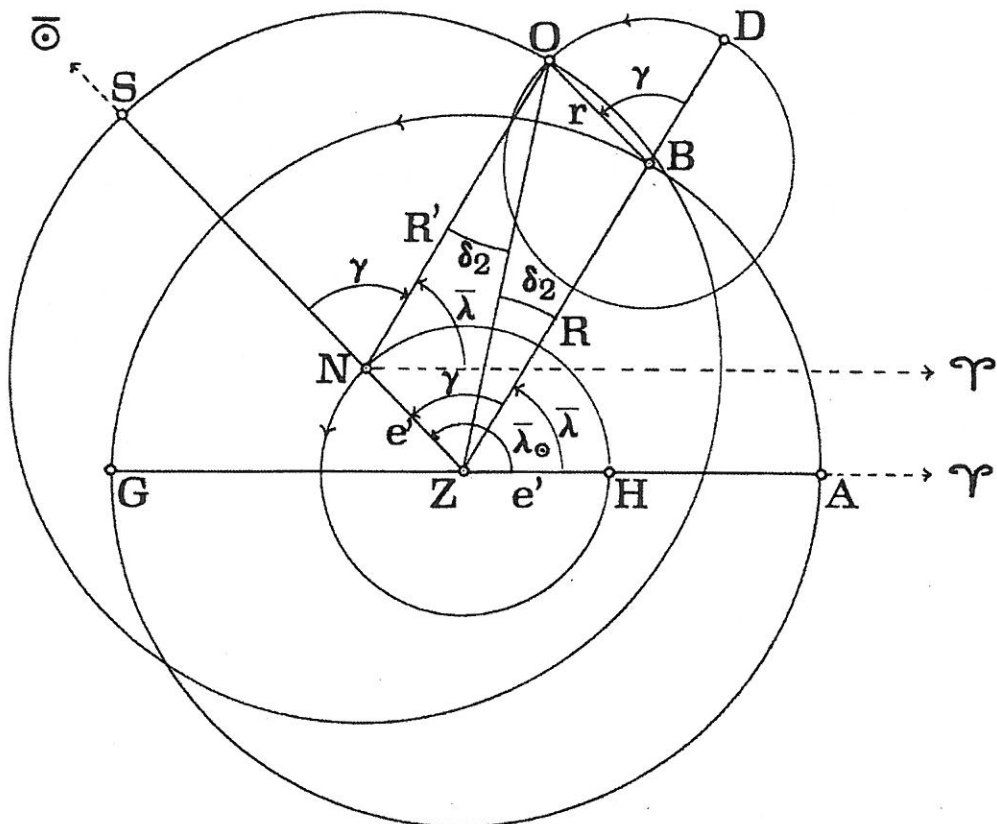
If [the synodic anomaly] is represented by the epicyclic hypothesis, ...

If the anomaly related to the sun is represented by the eccentric hypothesis (which is a viable hypothesis only for the three planets which can reach any elongation from the sun), in which the centre of the eccentre moves about the centre of the ecliptic backwards along the signs with the speed of the [mean] sun, while the planet moves on the eccentre forwards along the signs with a speed with respect to the centre of the eccentre equal to the [mean] motion in anomaly, ...

**In other words, retrograde motion (of the outer planets) does not have to be represented by an epicycle, but can be represented via an eccenter.**

# Ptolemy's Two Apollonian Models for Retrograde Motion (Outer Planets)

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## Radius Ratios

	<u>Almagest</u>	<u>De Rev</u>	<u>modern</u>
Mercury	0.375	0.360	0.3871
Venus	0.719	0.719	0.7233
Mars	1.519	1.520	1.5236
Jupiter	5.217	5.246	5.2027
Saturn	9.231	9.164	9.5719