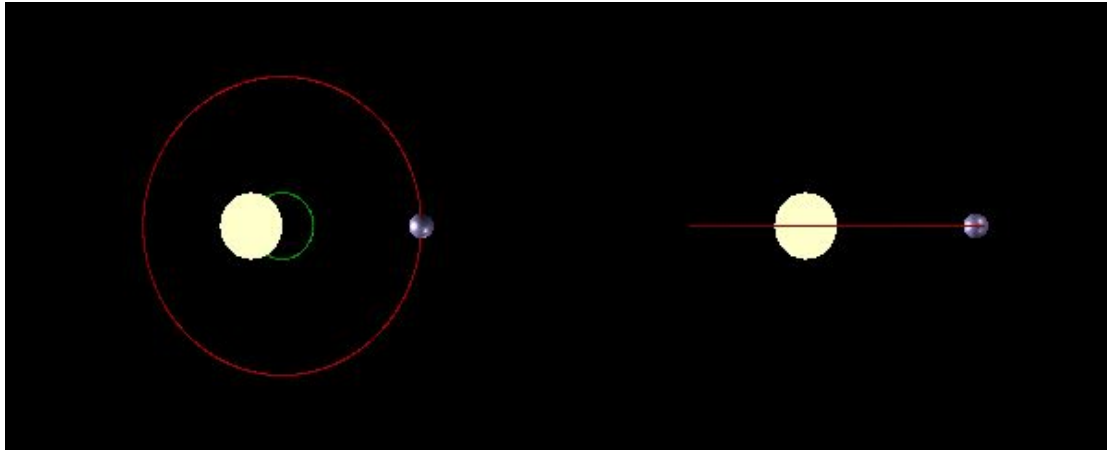


## On variations in proper motion from the Sirius system barycenter

Like in our solar system, the Sirius system, with its planets, has its center of gravity not in the axis of Sirius, but at a point that Sirius itself orbits. This orbit will cause Sirius to move across the night sky with the diameter of the orbit around the barycenter. The diameter of this orbit in our solar system is about 2x the diameter of our sun; our sun if seen from Sirius would have a variation in proper motion twice that of its angular diameter.



The angular diameter of Sirius, how large it appears from the vantage point of our solar system, is larger than Betelgeuse and Procyon, as well as larger than Mars.





The variations in proper motion for Sirius, that F. W. Bessel attributed to his nonsensical "invisible companion", measure 6.5 arc seconds with a periodicity of 50 years. The angular diameter of Mars is at its smallest 3.5 arc seconds, and as Sirius has an angular diameter greater than Mars, its orbit around the Sirius system barycenter will be at least 3.5 arc seconds \* the diameter of the barycenter orbit. With the proportions of our solar system applied to the Sirius system, a barycenter orbit 2x that of the diameter of Sirius, and an angular diameter for Sirius that of the lower bound for Mars angular diameter, the variation in proper motion for Sirius would be  $3.5 * 2 = 7$  arc seconds.

