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Homework Assignment 3

Kepler's contribution to the Copernican revolution

Johannes Kepler is remembered primarily as an astronomer who changed the understanding of planetary motion. Furthermore, he was one of the first to accepted Copernicus's heliocentric cosmos (Russel, 1972). His significant contribution was discovering that planets move in elliptical orbits rather than perfect circles (Rothman, 2020). Like Copernicus, he asserted the physical reality of a heliocentric model as opposed to a geocentric one. Moreover, explained how planetary velocities vary (Capar 1959). Kepler stated three laws that measured the astronomical observations like the following:

1. The orbit of a planet is an ellipse with the sun at one of the two foci.
2. The line segment joining the sun and a planet sweeps out equal areas during equal intervals of time.
3. The square of the orbital period of a planet is proportional to the cube of the semimajor axis of its orbit.

Calculations of the orbit of Mars indicated these elliptical orbits of planets. From this, Kepler inferred that other planets also have an elliptical orbit, including those farther away from the sun. The second law establishes that planets closer to the sun travels faster. The third law states that the farther a planet is from the sun, the slower its orbital speed. (Katsikadelis, 2017) His first main contribution to the Copernican revolution is with his published book Astronomia nova in 1609, where he defines the planets' orbits with these three laws.

References

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