

Philosophy 167: Science Before Newton's PRINCIPIA

Assignment for December 2

Newton's De Motu Corporum in Gyrum, Version 1

Reading:

Correspondence between Hooke and Newton, 1679/80, from The Correspondence of Isaac Newton, Volume II, 1676-1687, ed. H. W. Turnbull, especially pp. 309-313.

Newton, Isaac, "The Motion of Revolving Bodies," from Herivel, The Background to Newton's Principia, pp. 277-292.

Wilson, "From Kepler's Laws, So-Called, to Universal Gravitation: Empirical Factors," pp. 147-160.

Questions to Focus On:

1. What question did Hooke ask Newton to address with his "excellent method"? To what extent does Newton answer this question in De Motu? Does he use his "excellent method"?
2. The version of the tract De Motu that was sent to the Royal Society proceeds from four announced hypotheses. What is the basis or source of each of these hypotheses?
3. Precisely what conclusion or conclusions can be drawn from De Motu about Kepler's area rule? Do Newton's results support Kepler's suspicion that the area rule and the ellipse go together?
4. Precisely what conclusion or conclusions can be drawn from De Motu about Kepler's claim that the planets and their satellites move in elliptical orbits?
5. Precisely what conclusion or conclusions can be drawn from De Motu about the claim that the periods of the planets and their satellites about their respective principals vary as the $3/2$ power of their mean distance from their principals?
6. The last four Problems of De Motu concern projectile motion and its constituents under various assumptions contrasting with those of Galileo. How do these four problems fit into the rest of De Motu -- e.g. do they even belong in it?
7. What claims, if any, does De Motu make about celestial physics -- i.e. about the physics underlying planetary orbits?