Stephenson, Bruce

Kepler's physical astronomy. (English) Zbl 0626.01013

Studies in the History of Mathematics and Physical Sciences 13. New York, NY: Springer (ISBN 0-387-96541-6/hbk; 978-1-4613-8739-8/pbk). vii, 217 p. (1987).

The book is an attempt to understand some of the technical details of Kepler's physical theories. The author explains how the physical astronomy works, for surprisingly little of it has been explained before and also shows how Kepler's detailed investigations were always directed at the larger goal of understanding the true design of the heavens.

The author points out that Kepler was the first astronomer forced to confront planetary motion as a physical problem. An essential element of his theories was the physics underlying them. The physics was flawed at the foundations for he lacked the modern concept of inertia. The author attempts to constitute a major new look at Kepler's astronomy. It will yet be incomplete, from Kepler's point of view; for the author does not touch deeply upon the archetypes underlying Kepler's universe, nor on the harmonies expressed in it. In this book, the author does not examine Kepler's extraordinary technical skills at bringing the raw observations to use in the development of astronomical theory. He attempts to explore and explain the development of Kepler's planetary theory and the physical hypothesis integral to that theory, more faithfully than has yet been done. The author focusses on the views of Kepler's lunar theory. Kepler developed an ingenious account of physical process that would explain the four known inequalities in lunar observations, and elaborated it with rather elegant geometrical constructions to calculate lunar positions from physics. The author takes care of giving them, at last, the attention they deserve. He shows that many of Kepler's odder hypotheses such as those concerning possible celestial "minds" governing planetary motion, far from being gratuitous speculation, played an important role in his physical analysis and in the argument of the "Astronomia nova". The author does not compare Kepler's work with that of contemporary astronomers or natural philosophers. The book is mainly divided into five chapters viz. (i) Introduction, (ii) Mysterium cosmographicum, (iii) Astronomia nova, (iv) Epitoms of Copernican astronomy, (v) Kepler and the development of modern science. Each chapter is well written and the discussion is very lucid with a scholarly approach. The book is useful to those who are going to study on history of astronomy.

Reviewer: P.K.Majumdar

MSC:

01A45 History of mathematics in the 17th century
85-03 History of astronomy and astrophysics

Keywords:

Lunar theory; Copernican astronomy. planetary theory; lunar theory

Biographic references:

Kepler, J.