

Spring 2026  
Prof. Sowinski

**PHYS 100**  
**Physics and the Natural World** University of Rochester  
*Department of Physics & Astronomy*

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Please answer the following. Write legibly, use full sentences, and large enough so that my poor eyes can read what you wrote. Ad Astra Per Aspera!

What was the nickname given to Eratosthenes by his contemporaries, and why?

What aspect of Eratosthenes measurement do historians not agree upon? What does this imply about the measurement?

Draw the orbit of a celestial body in the Ptolemaic model, and label the *Earth*, the *orbiting body*, its *deferent*, *equant*, and *epicycle*. What shapes are the deferent and epicycle?

What observation of heavenly motion needed the introduction of an equant?

What observation of heavenly motion needed the introduction of an epicycle?

What about the illustration of atoms enraged Heisenberg as a youth?

What does *spiritual* mean for Heisenberg?

What do you think Heisenberg means when he says that what distinguished the Greeks from their contemporaries was their ability to *pose questions of principle and practical action*?

What is Hawking's definition of a *theory*?

According to Hawking, what is the ultimate goal of science?