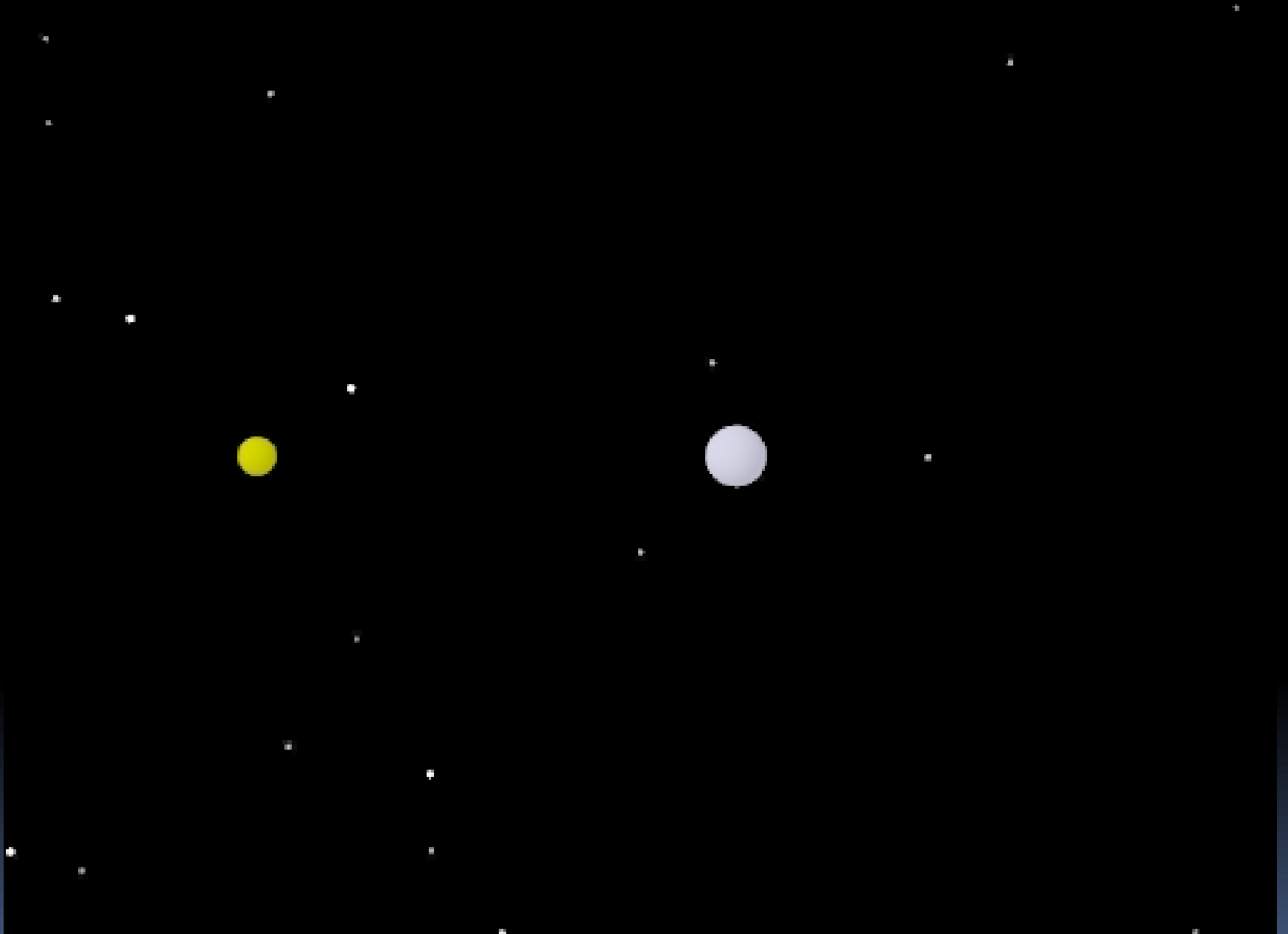


3-D Animations for Conceptual Astronomy

Michael R Gallis
Penn State Schuylkill

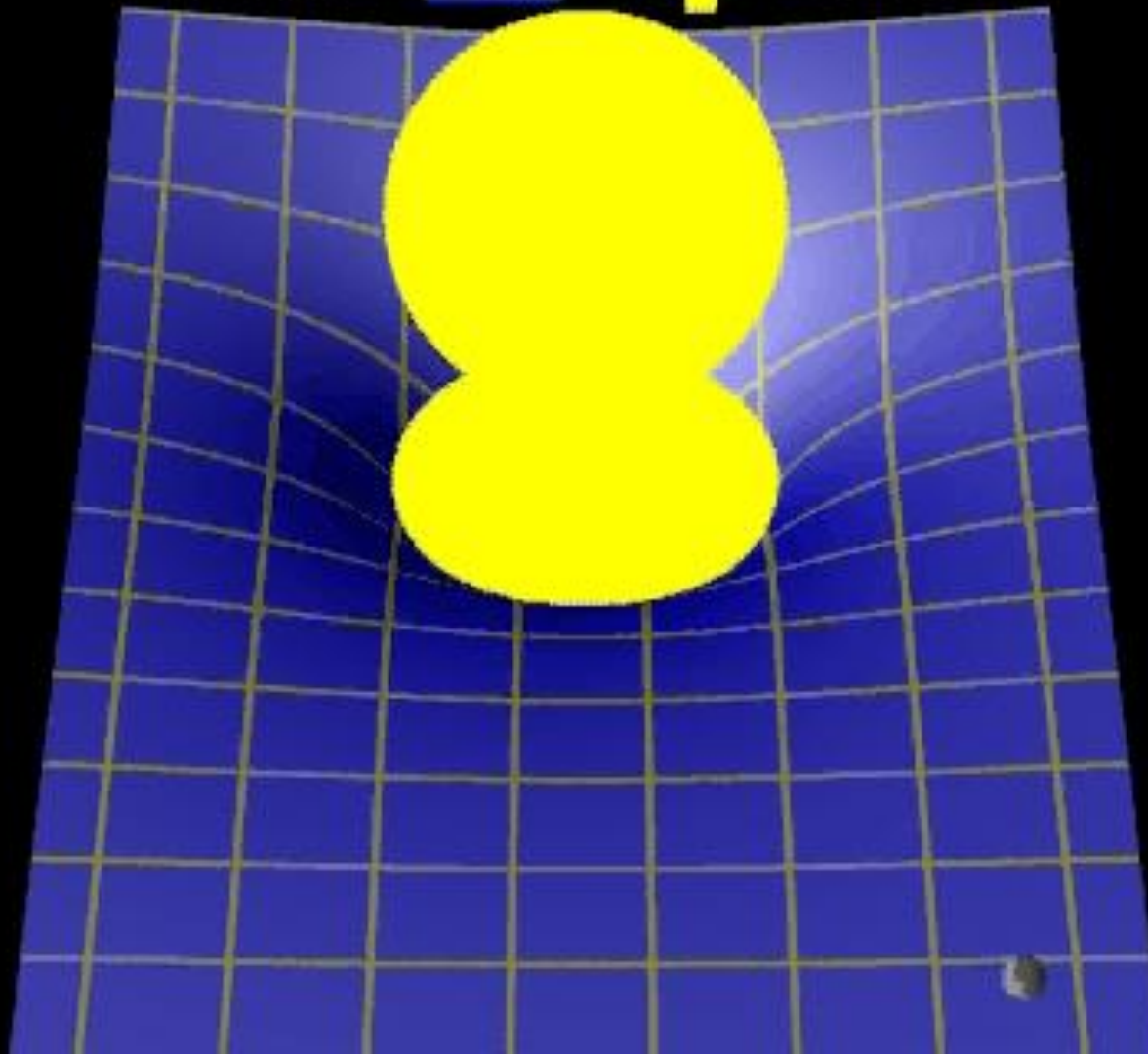
Instructors who teach conceptual astronomy often face the challenge of conveying concepts and ideas that have significant geometric content to students who are not inclined towards technical subjects. Visual aids such as computer animations facilitate the presentation of technical materials in a manner that is accessible to students without a strong mathematical background. This talk will cover example animations from the astronomy component of the Animations for Introductory Physics and Astronomy project at Penn State Schuylkill. The use of the animations in and out of the class will be discussed as well as student perceptions of the animations. The process by which the animations are created will also be briefly described.



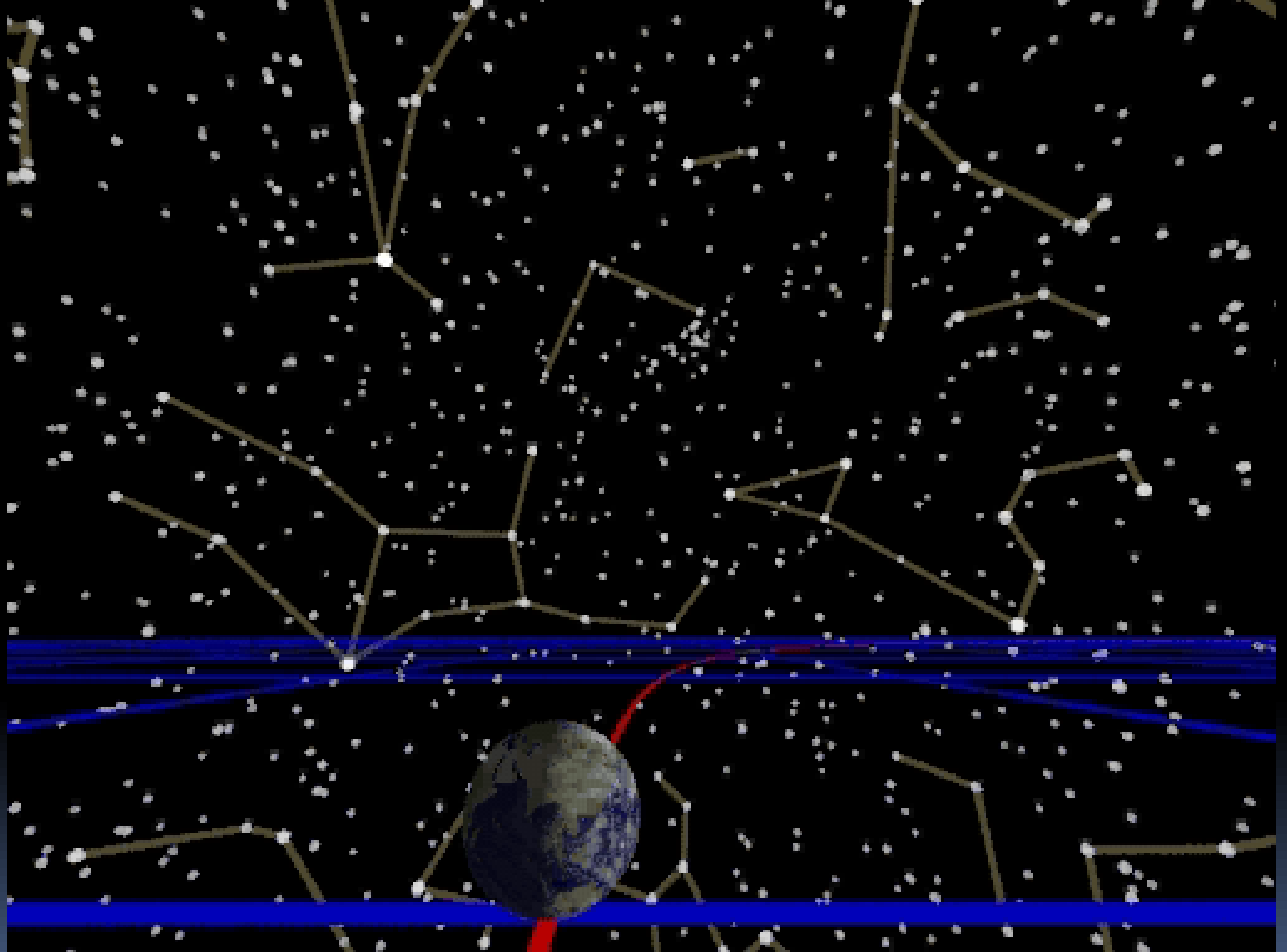
Mass Transfer in a Binary System

Impactor
Kinetic
Energy

Gravitational
Well
Depth



Converting Matter into Energy in a Gravitational Well



Stellar Parallax

Why Animations?

- Used in classroom as illustrations
 - Available to students online
 - Links in notes
- Easy to use format (.avi)
- Useable on Legacy Systems

Where and How

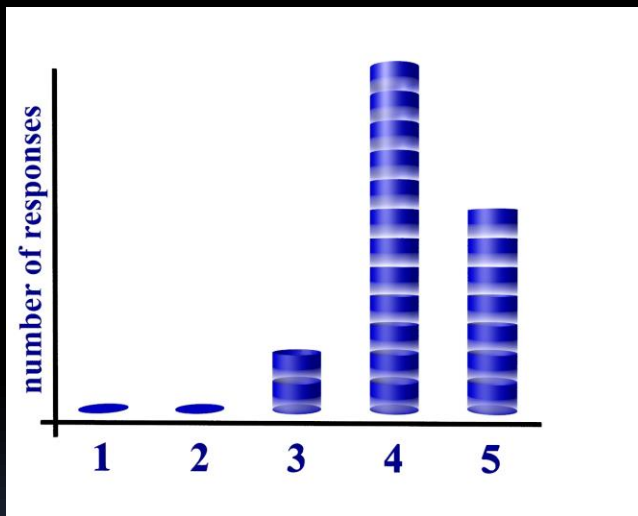
- Animations for Physics and Astronomy
 - phys23p.sl.psu.edu/phys_anim
 - 54 animations in Astronomy Category
 - Merlot, Compadre
 - YouTube channel www.youtube.com/mrg3
- Creative Commons License
 - BY-NC 3.0
- Created with free software
 - POV-Ray
 - VirtualDub

Assessment

Student Surveys from Conceptual Astronomy (Spring 07):

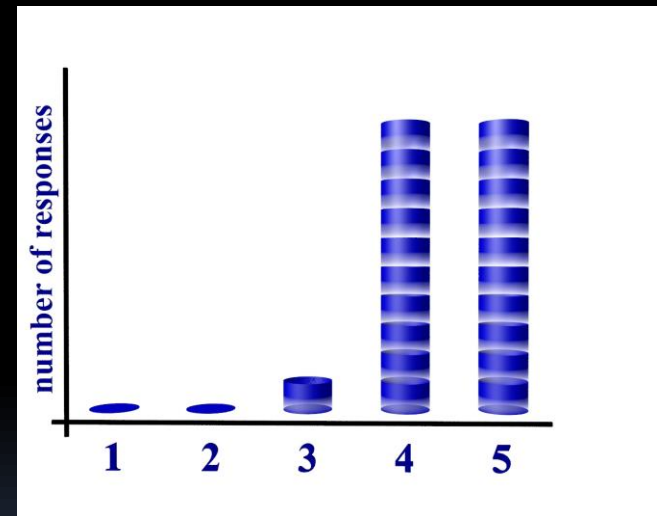
Indicate how strongly you agree or disagree with each of the following statements:
Because of the way this course uses Multimedia Course Materials:

I am better able to understand the ideas and concepts taught in this course.

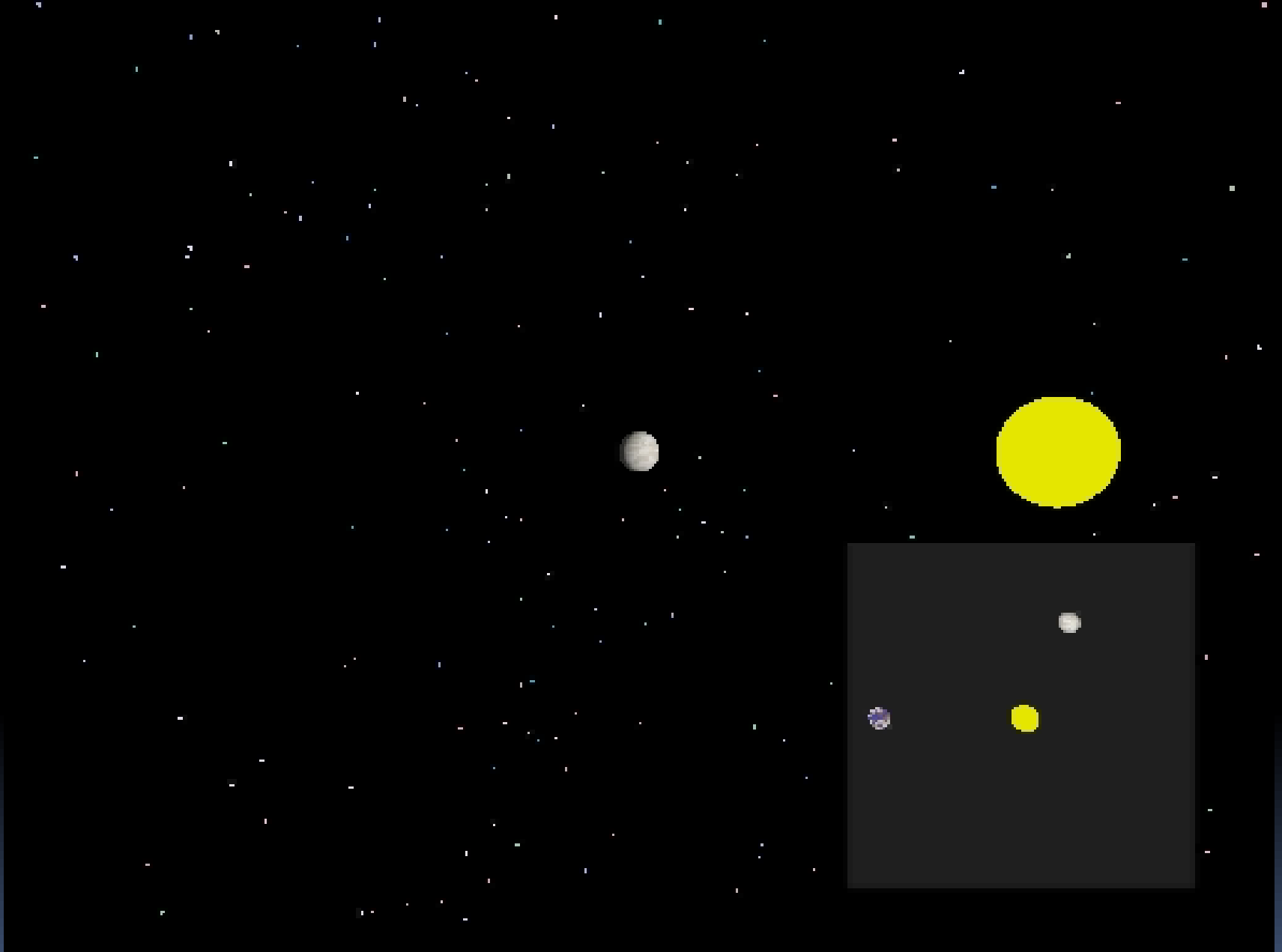


- 1- No Basis for Judgment/ Not Applicable
- 2- Strongly Disagree
- 3- Disagree

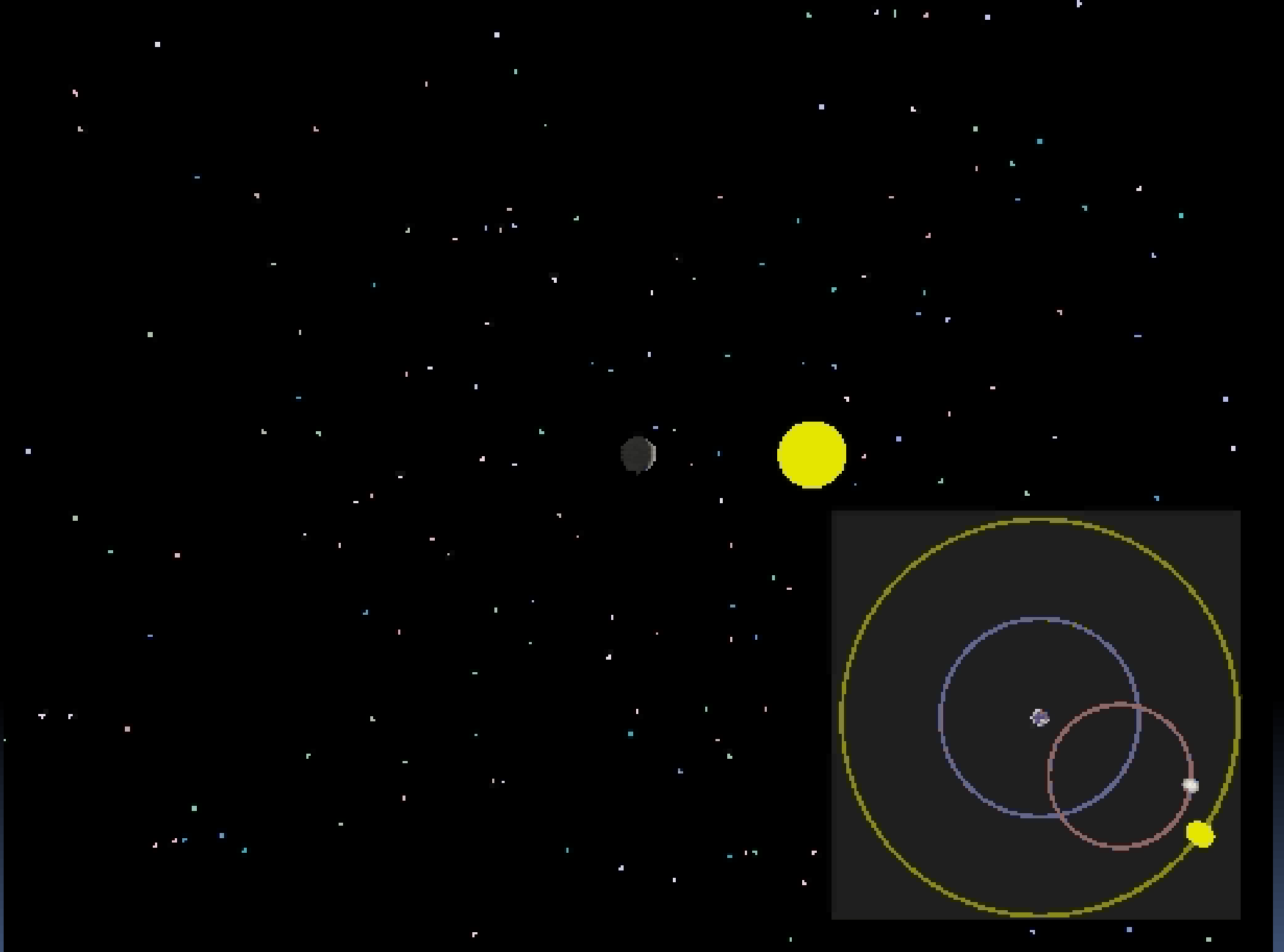
I am better able to visualize the ideas and concepts taught in this course.



- 4- Agree
- 5- Strongly Agree



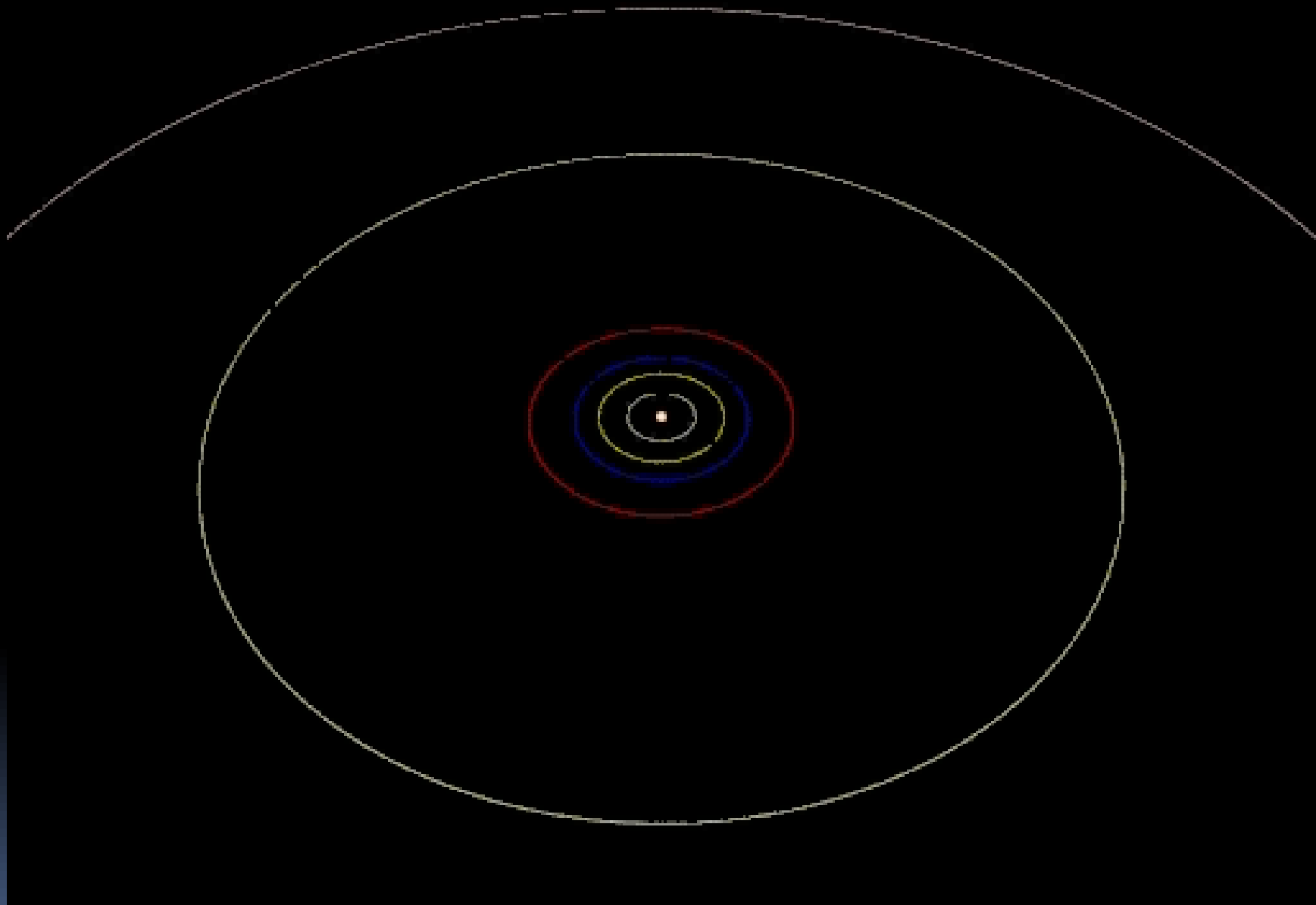
Phases of Venus ala Copernicus



Phases of Venus ala Ptolemy

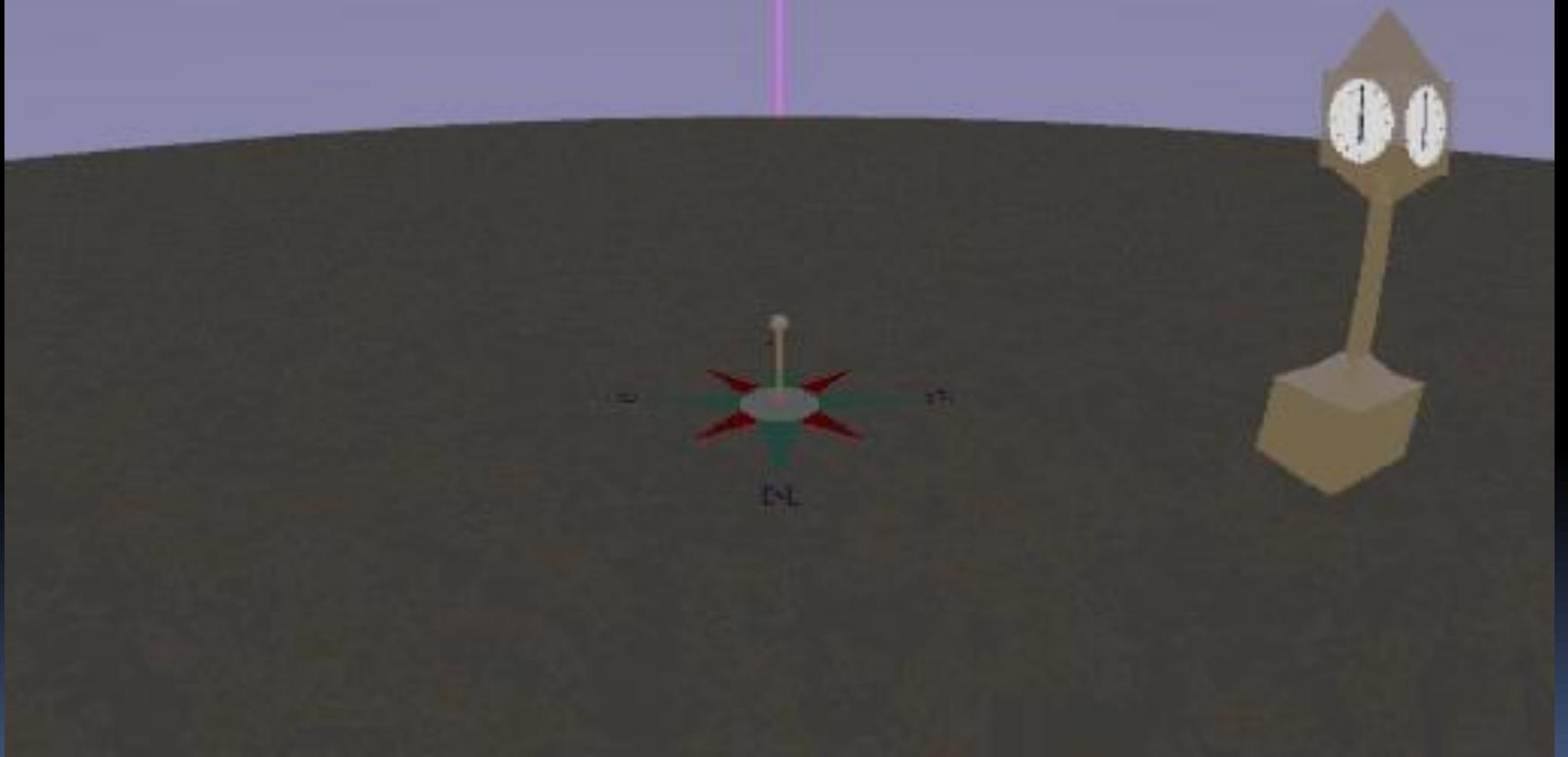


Orbital Elements

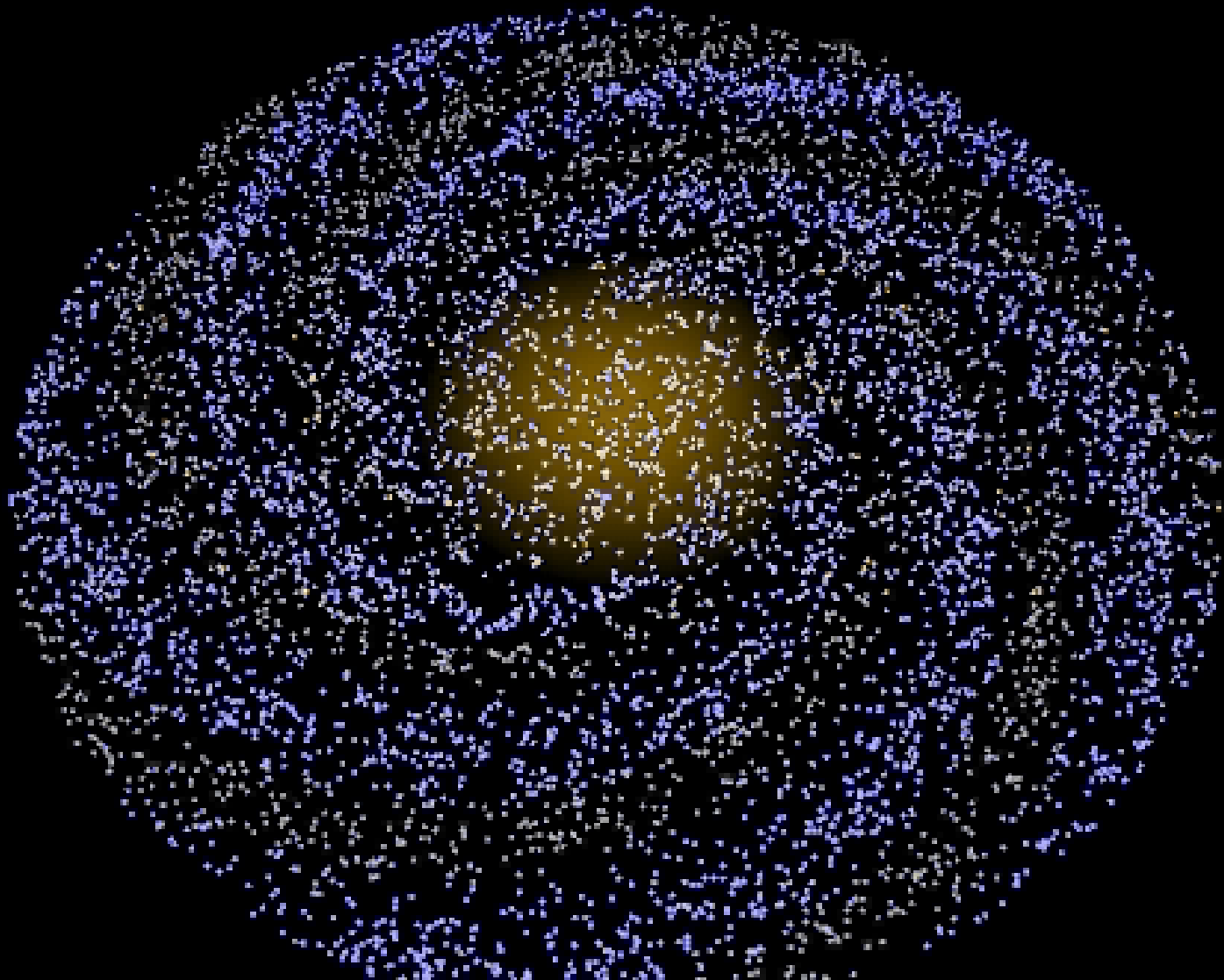


Asteroids

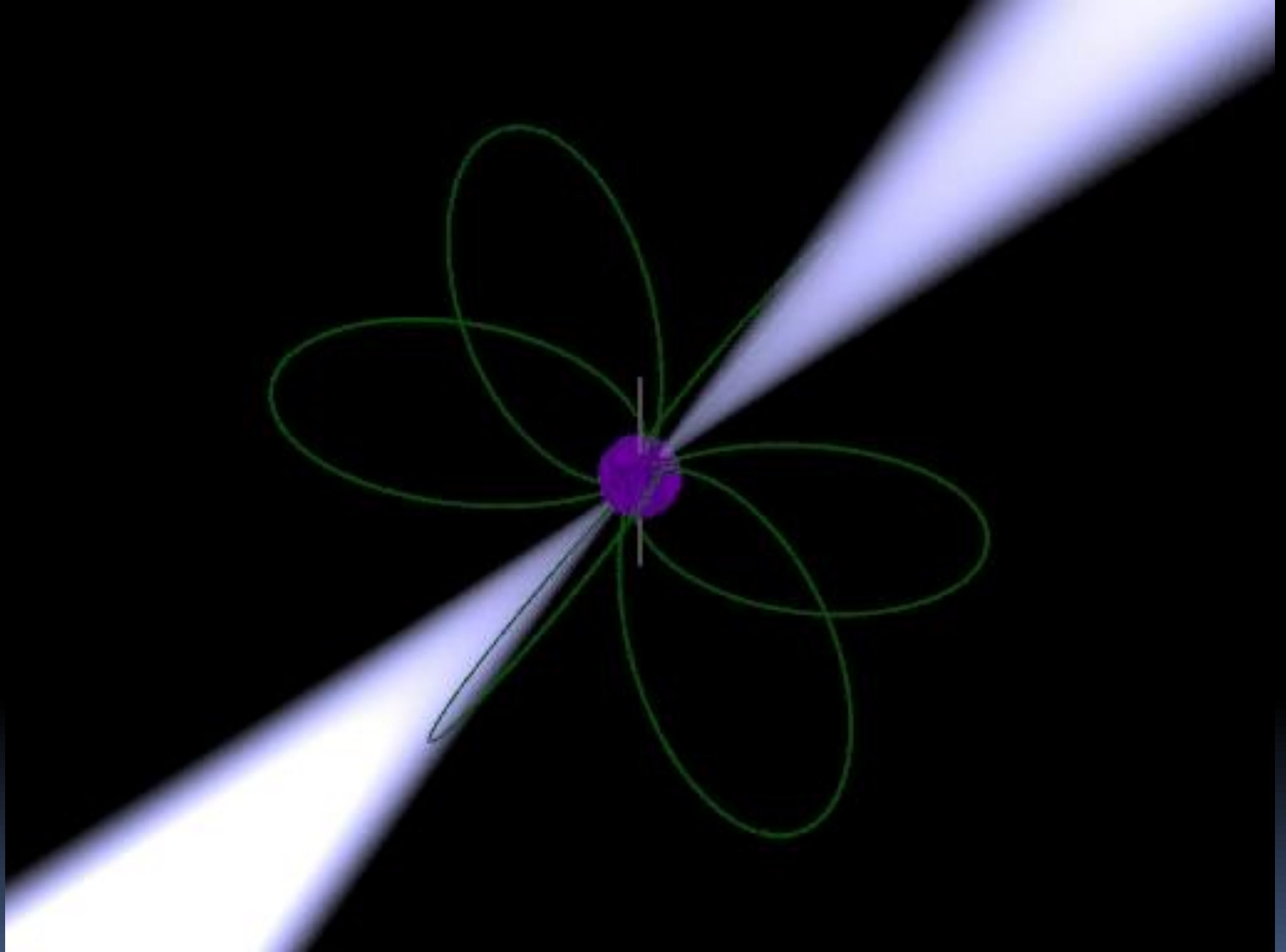
Winter Solstice



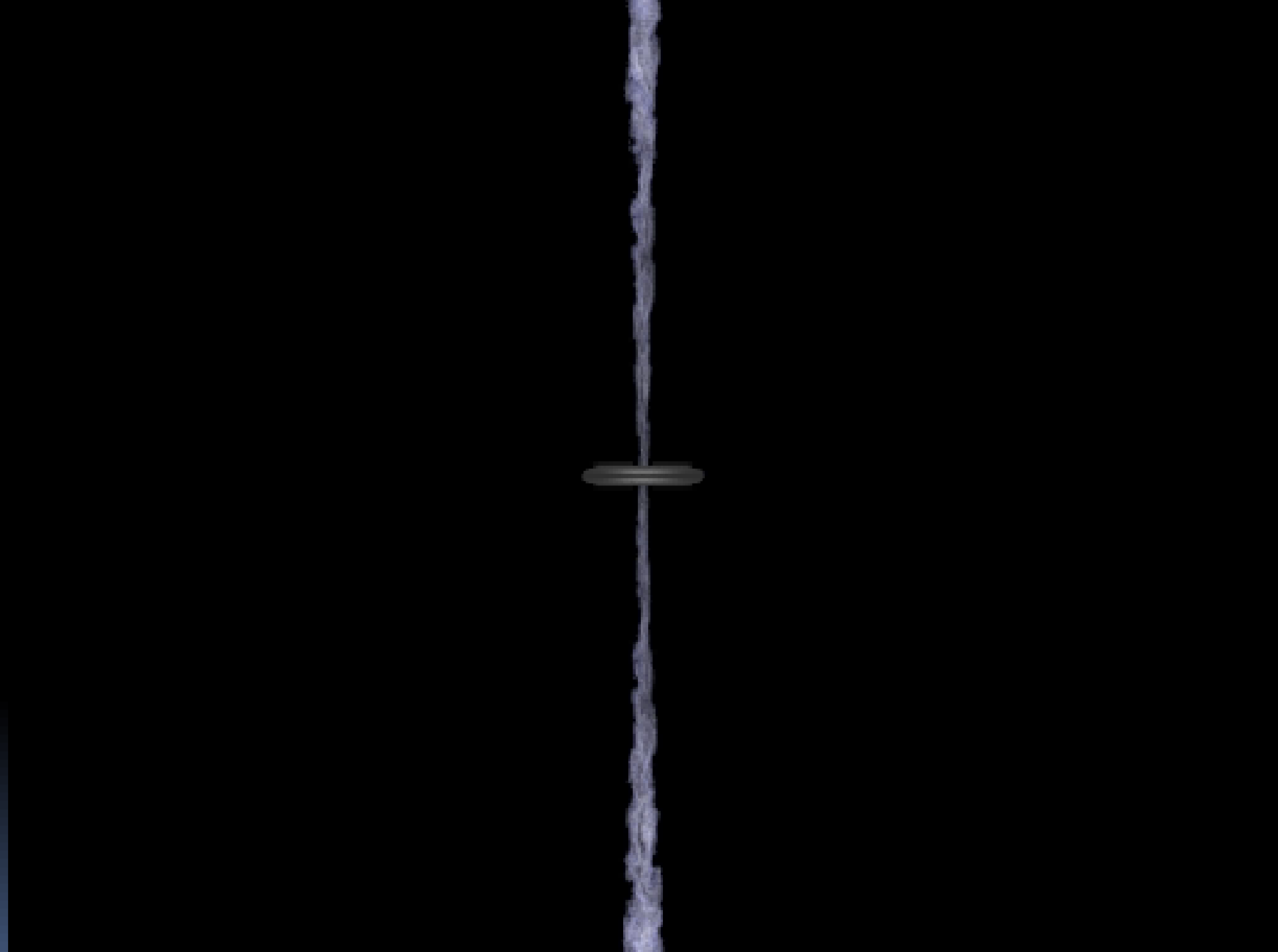
Shadow of the Gnomon



Density Waves and Spiral Arms



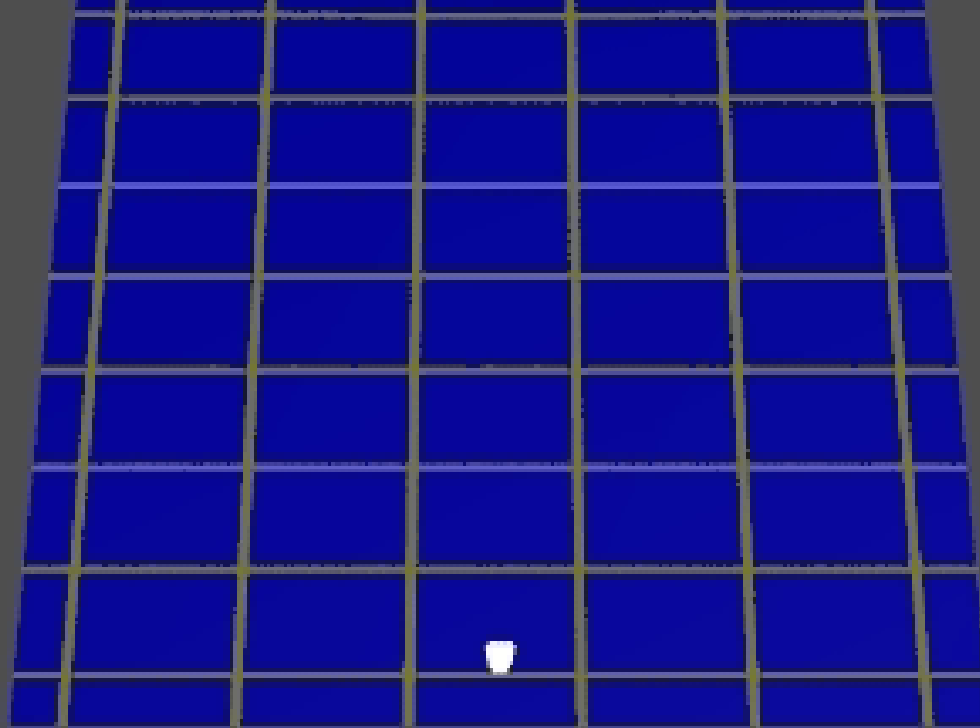
Pulsar



Anatomy of an AGN



Relative Motion



Gravitational Lens

Questions?