Human beings are driven to explore ourselves and the world around us and to ask how things work. Today it may be difficult for us to imagine how mysterious the inside of a living person seemed only about 100 years ago, when x-rays were discovered in 1895. Amazing breakthroughs have been made since then, such as the invention of the atomic bomb, penicillin, cloning and artificial intelligence. In this course we will look at the process of discovery as well as the implications of recent breakthroughs and developments. Students will choose topics and explore these issues using articles, books, and television programs. We might choose to debate global warming, string theory, or Lawrence Summers' comments about the innate ability of women in mathematics, discuss the ethics of biodiesel or unbreakable codes, or explore articles about whether we still need to learn multiplication tables. In this context we will focus on what science and mathematics is, strategies for success in these fields, ethical and philosophical considerations, public perceptions, applications to daily tasks, and the relationship of science and mathematics to American competitiveness and the global economy. The only prerequisite is an open mind.

Seminar versus Class?

Introduce yourself to a neighbor and discuss the difference between a seminar and a class.

Breakthroughs & Controversy in Science and Math

Seeds of research were planted. Latin root semen - “to seed”
1. a conference or other meeting for discussion or training. 2. a small group of students at university, meeting to discuss topics with a teacher. (Compact Oxford English Dictionary of Current English, 2005)

Common to every FYS:

- An introduction to research that is not discipline specific
- Interdisciplinary
- Connections with each other, faculty and the university

First Year Seminar Outcomes

- I. A. Recognize, differentiate, and effectively employ appropriate and increasingly sophisticated strategies to collect and interpret information;
- I. B. Successfully integrate disparate concepts and information when interpreting, solving problems, evaluating, creating, and making decisions;
- I. C. Examine and evaluate how their own personal, historical, and cultural perspectives affect the discovery and generation of knowledge;
- II. A. Articulate and comprehend effectively, using verbal or non-verbal communication suitable to topic, purpose, and audience;
- II. B. Use writing effectively to discover and develop ideas and to articulate positions in contexts of increasingly complexity;
- IV. C. Collaborate effectively with others in a shared process of inquiry and problem-solving.

Course Themes

- What is science and mathematics?
- Implications of research
- How and when are we convinced that a theory, experiment or proof is correct
- Diverse perspectives and disciplines

Names in Motion

Discussion Question

How could we know that the earth is round without using modern technology?

Interdisciplinary

How could we know that the earth is round without using modern technology?

Interdisciplinary

How could we know that the earth is round without using modern technology?

Geography

Philosophy

Physics & Astronomy

Mathematics

History

Navigation

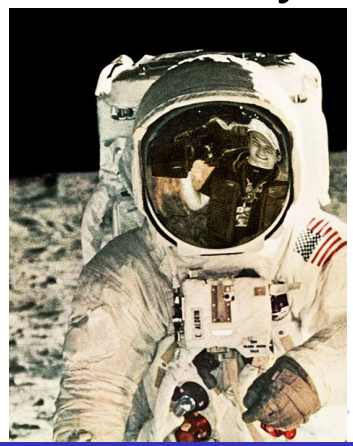
Weather

Interdisciplinary

How could we know that the earth is round without using modern technology?

Geography
Philosophy
Physics & Astronomy
Mathematics
History
Navigation
Weather

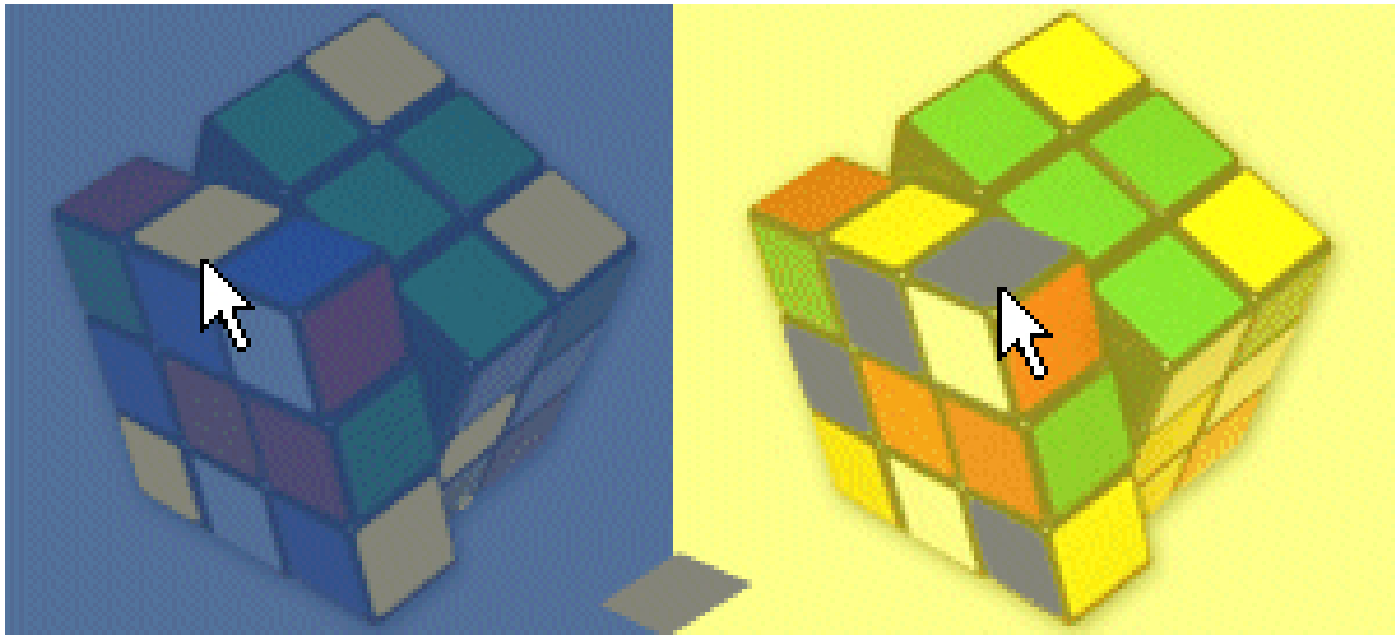
Still controversial: flat earth society



Science & Math Revolutions Change Society & Culture

Acknowledge: Jeff Goodman

- They require imaginative leaps
- New ideas are accepted if they have predictive power
- Understanding what we are seeing is complicated by filters



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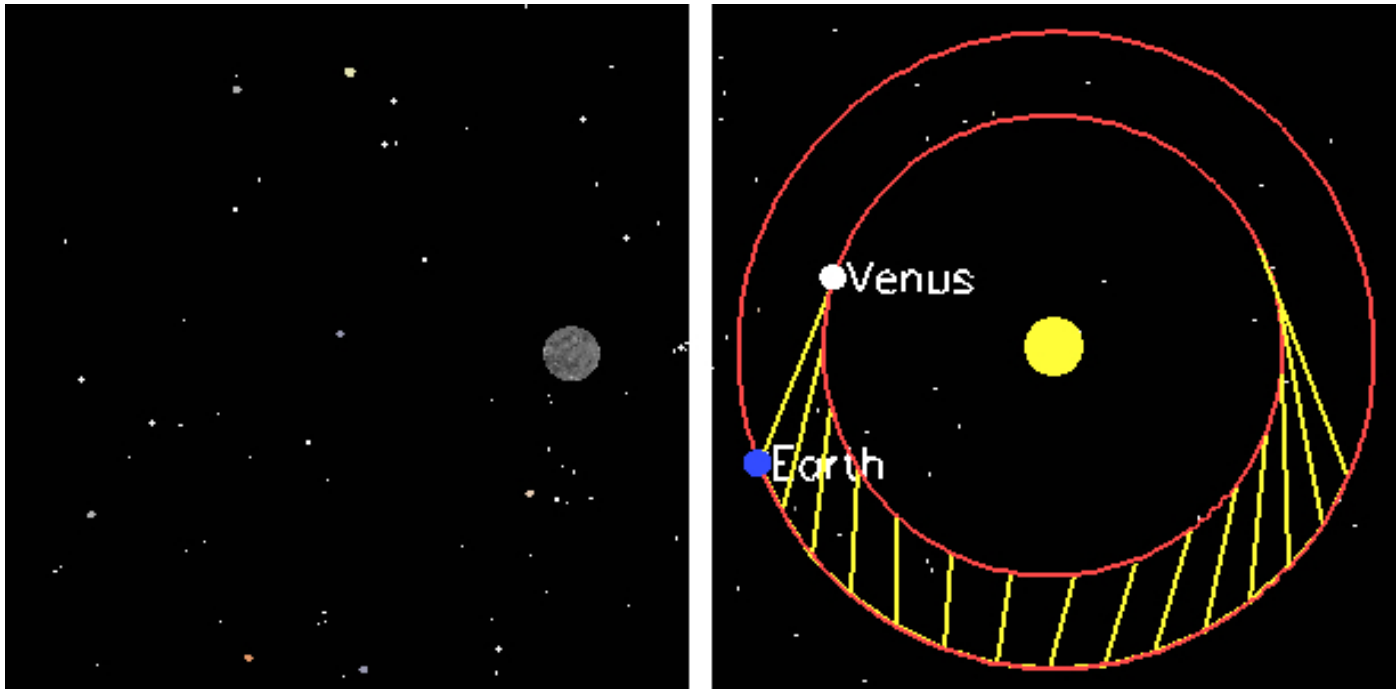
Nicolaus Copernicus (1473-1543): Heliocentric Model



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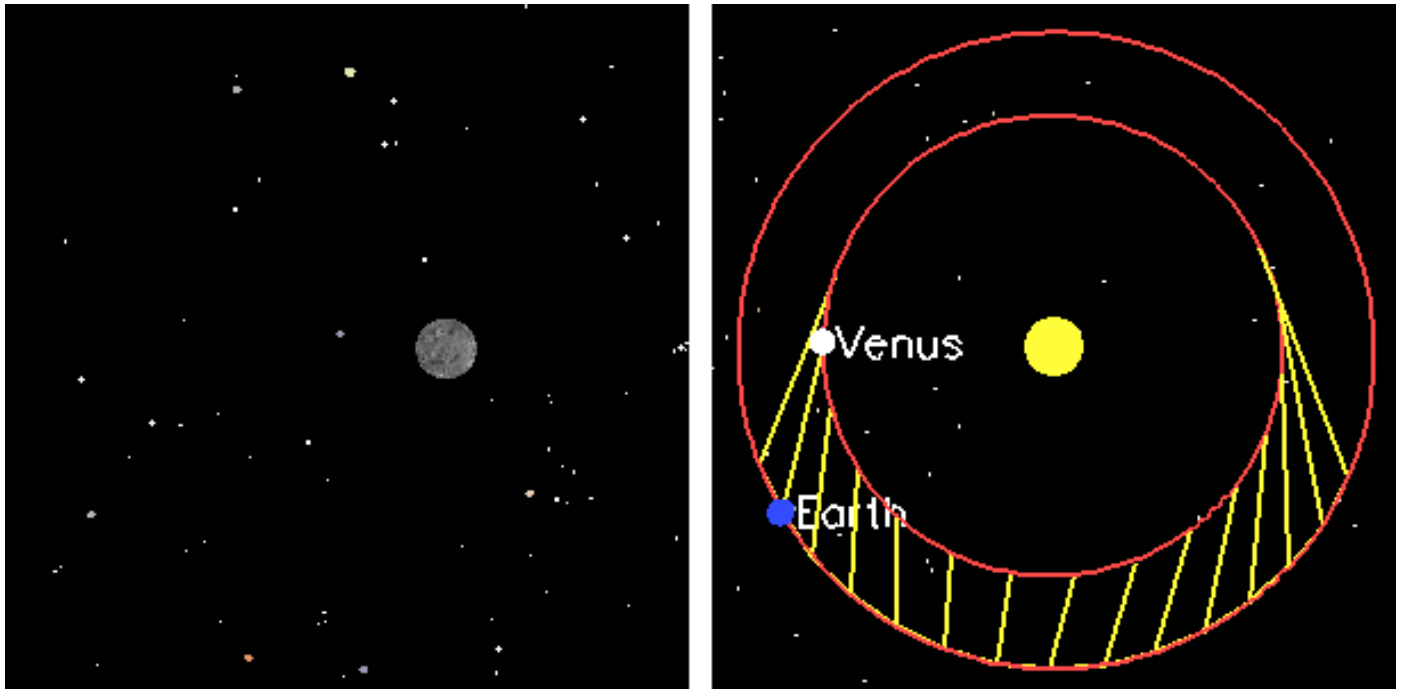

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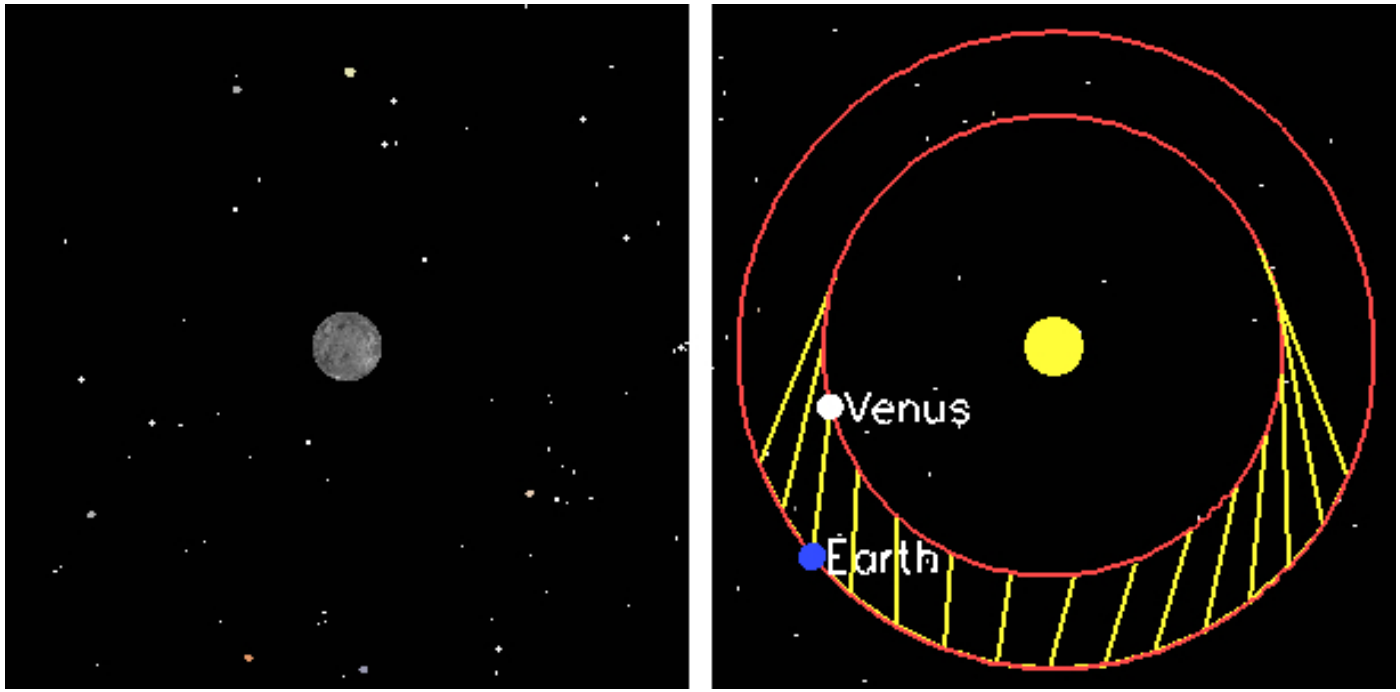

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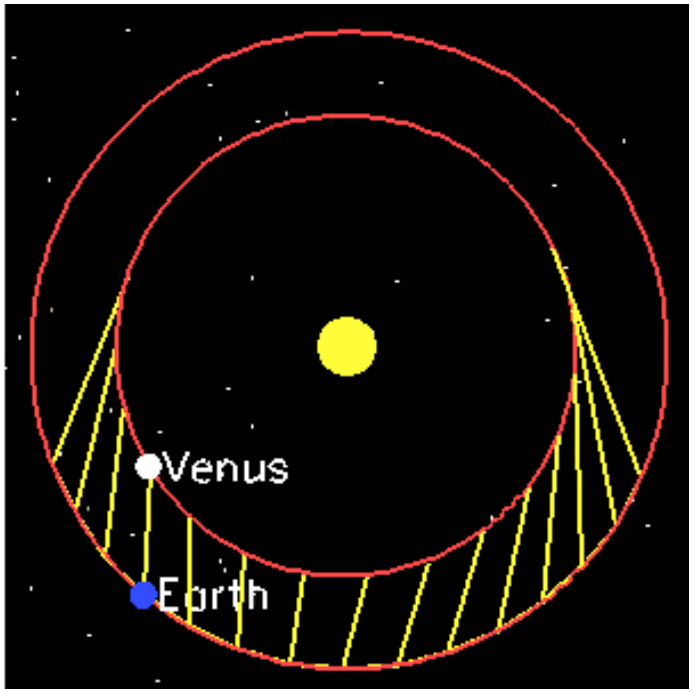

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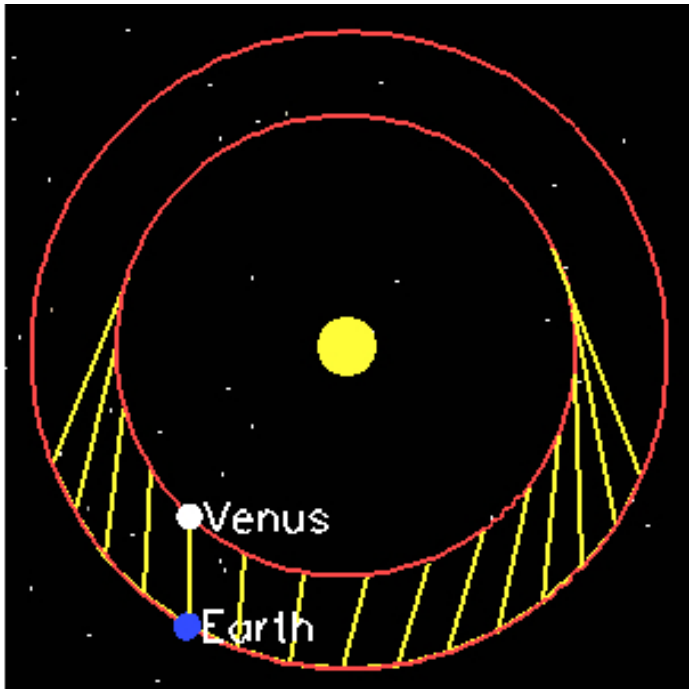

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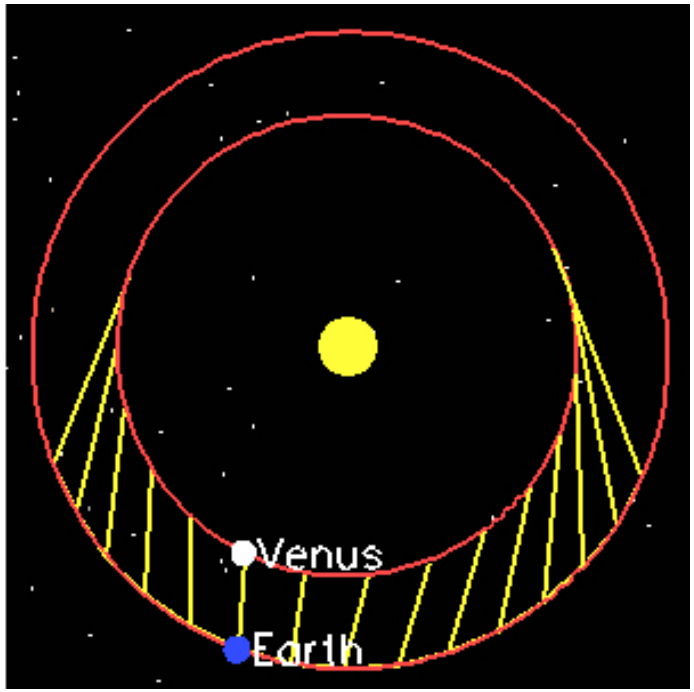

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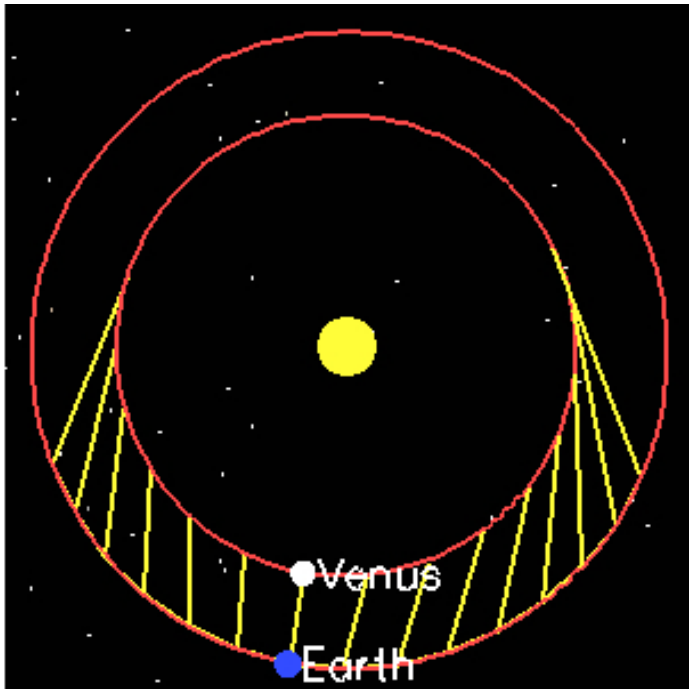

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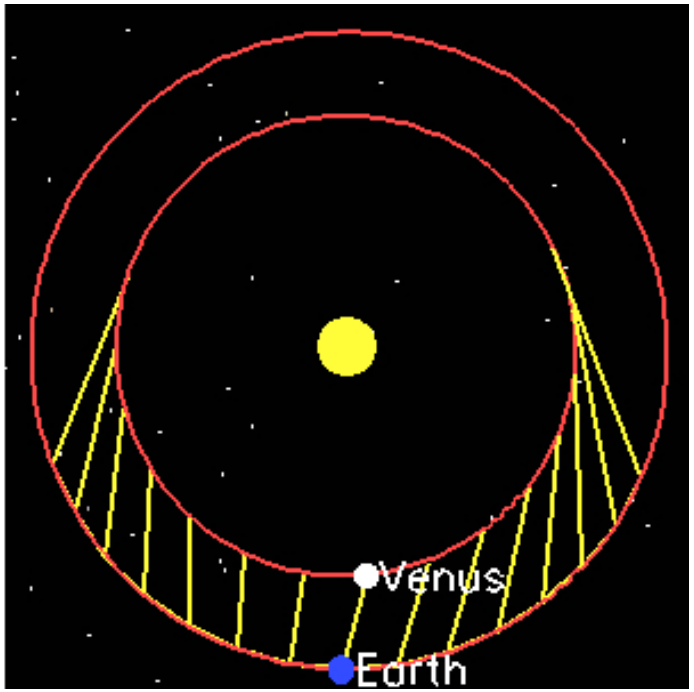

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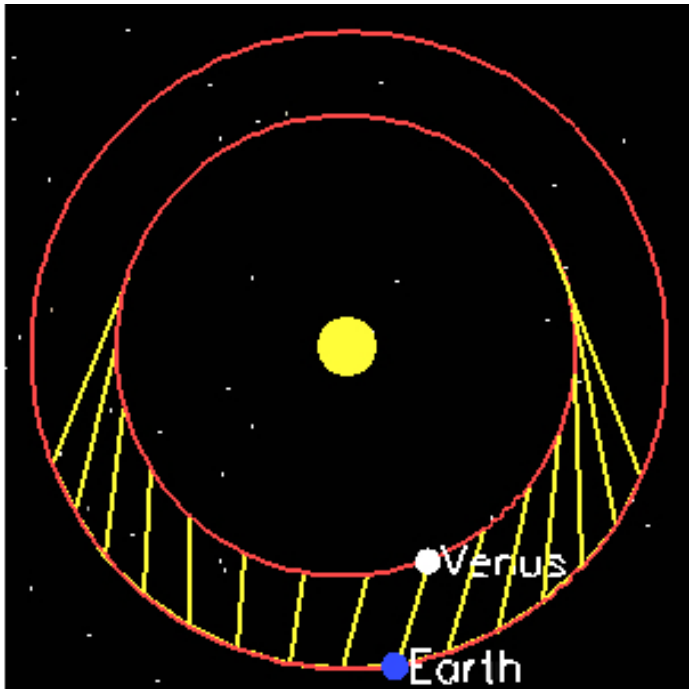

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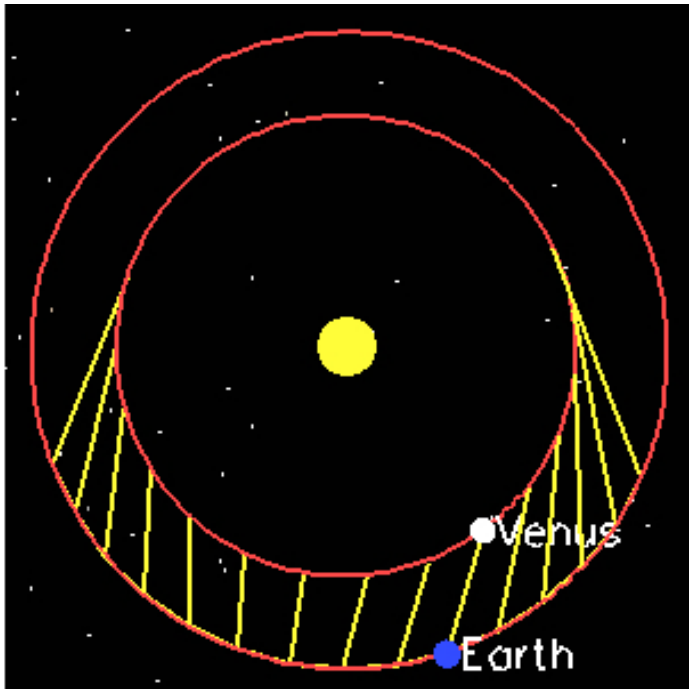

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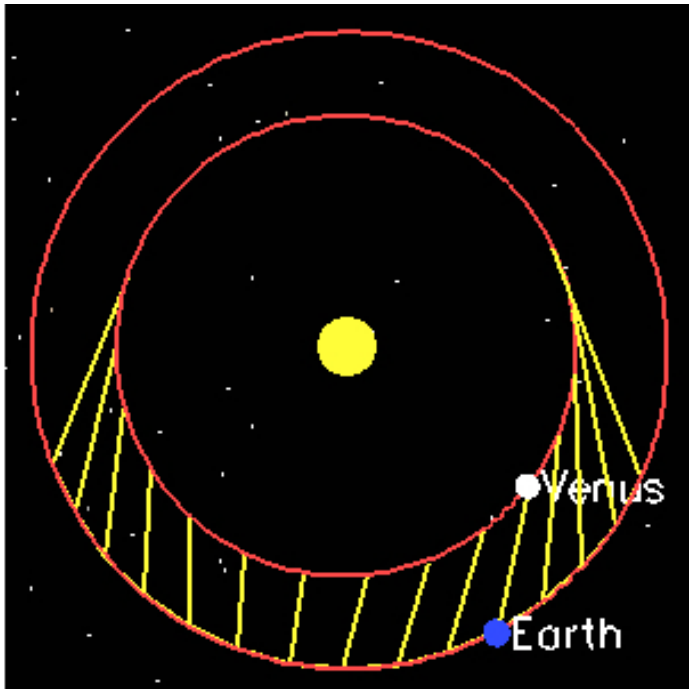

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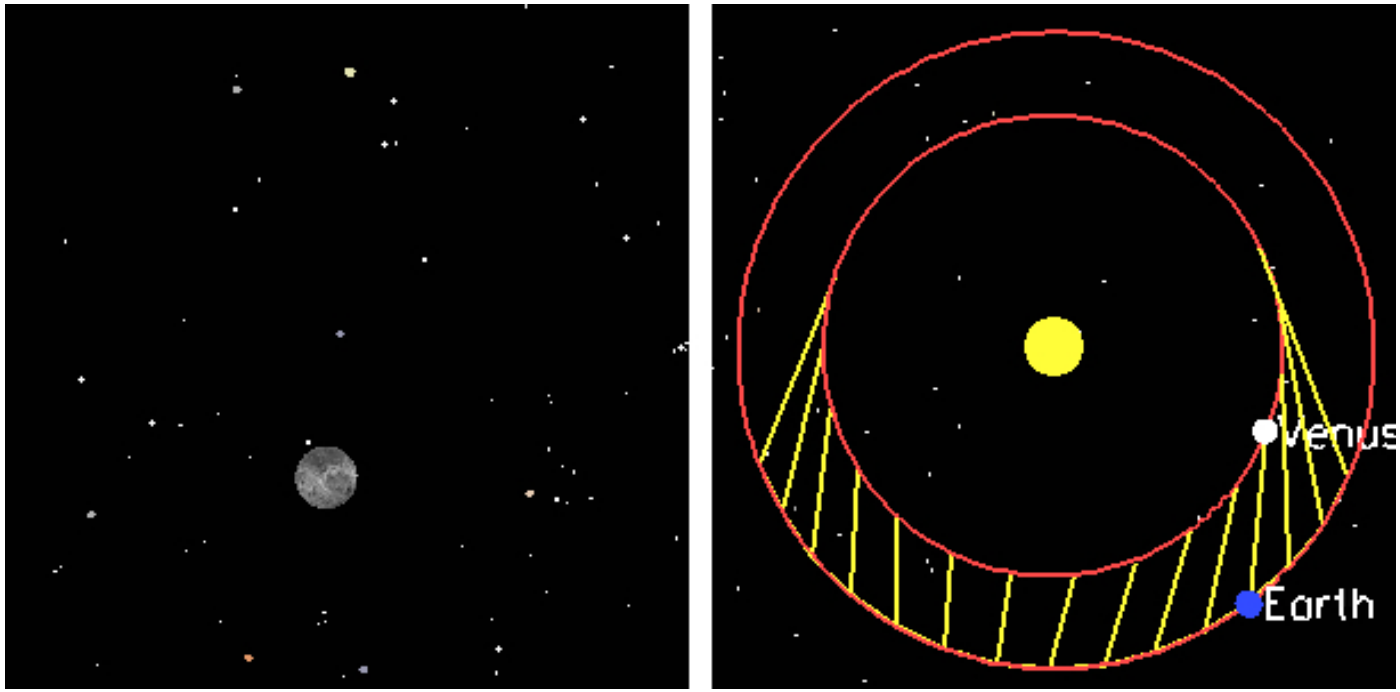

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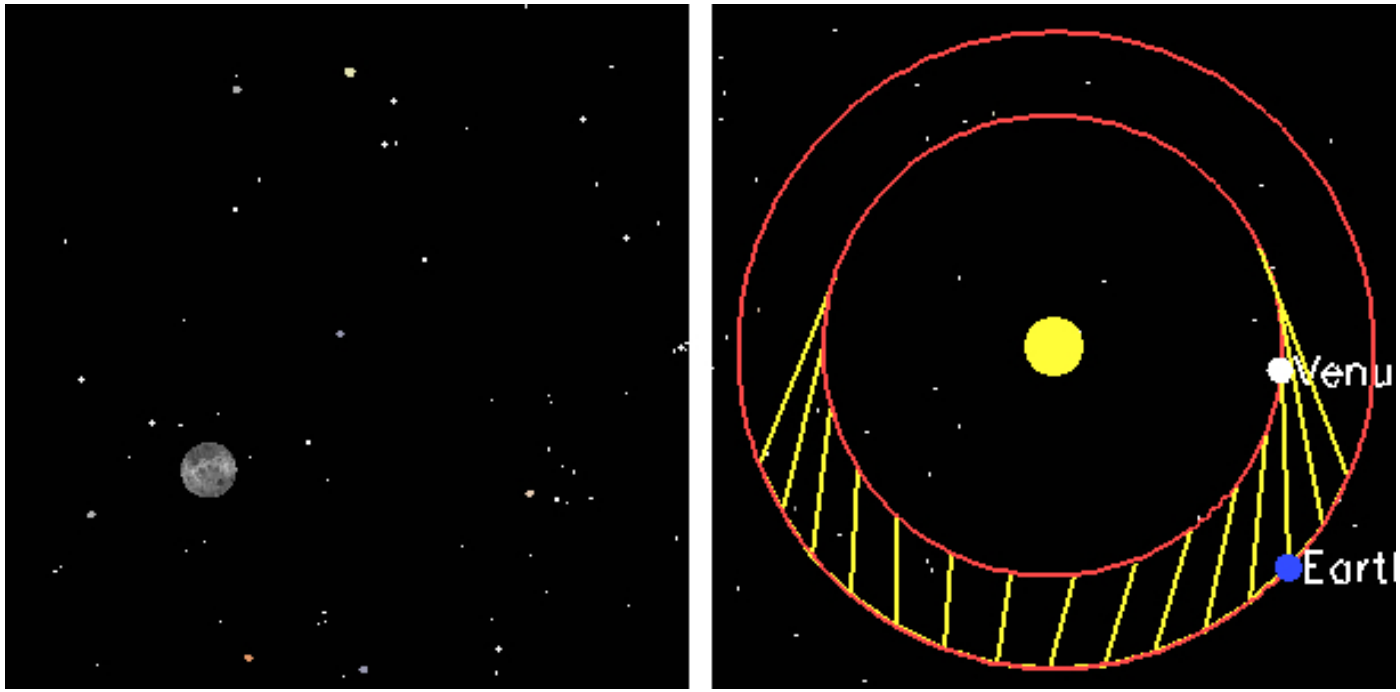

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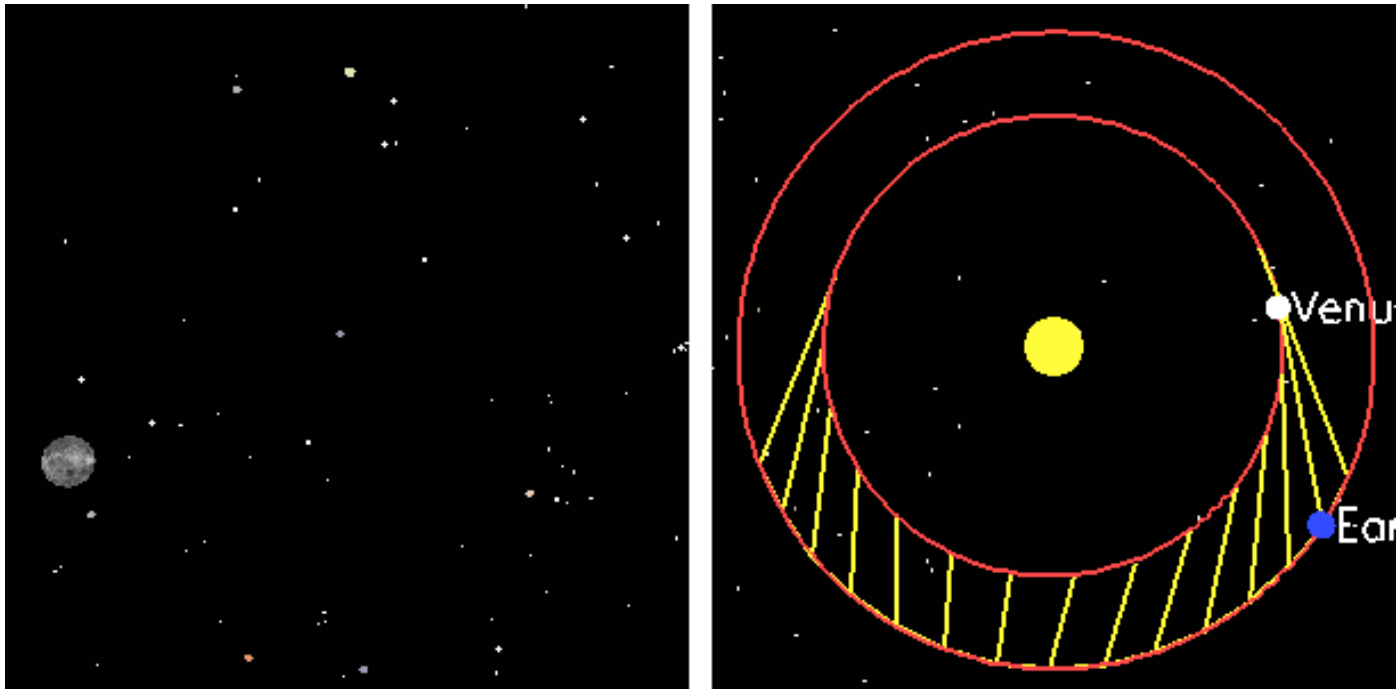

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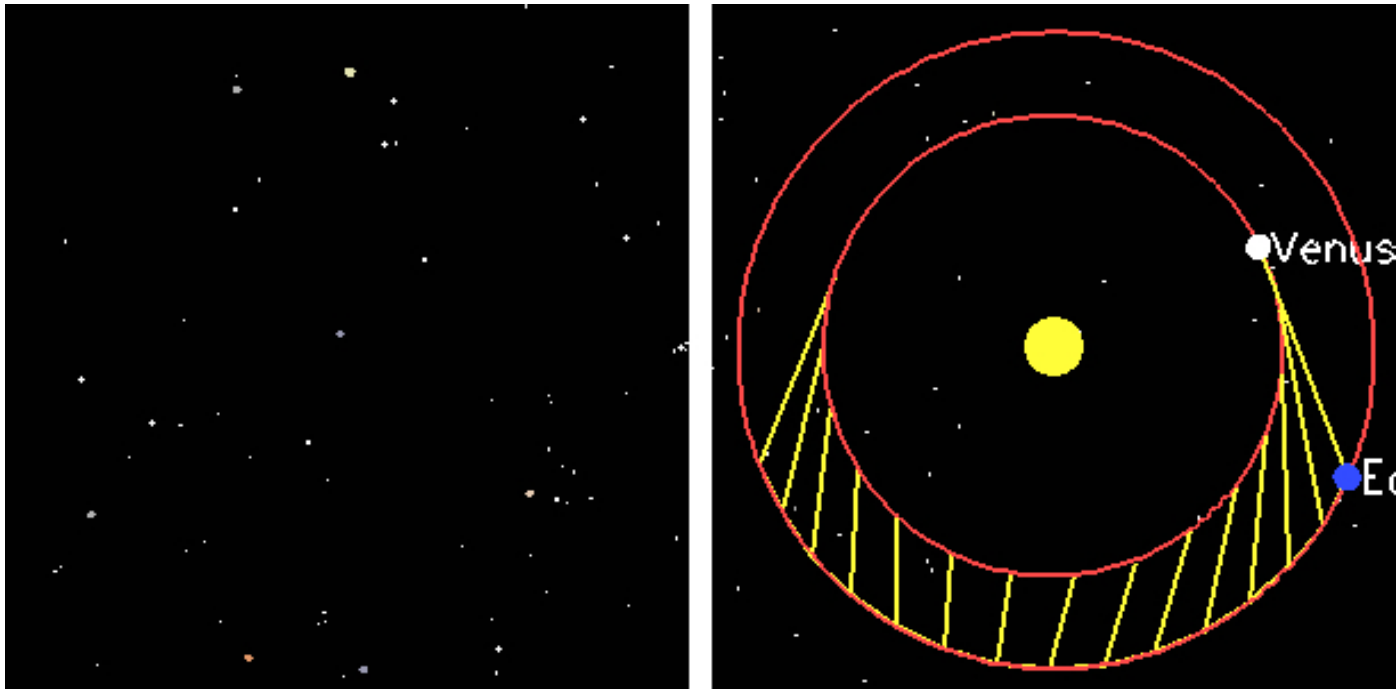

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- Resistance to new ideas comes about because, invariably, new problems arise from them (ellipses, perturbations of Uranus)

Break up into 5 groups and learn the names of the people in your group. Computer lab 307b:

- Collecting data about your interests: survey on asulearn.appstate.edu/
- Research diverse perspectives on your universe question, share with your group members, and prepare to share what you found with the rest of the class on Thursday.