

Randall, *Dark Matter and the Dinosaurs*, Ch. 7-9
Wesley Advocates 14 January 2018

The Short, Glorious Lives of Comets

Look closely at figure 13, Giotto's *Adoration of the Magi*. What do you see, and why does that matter to Randall's argument?

Describe the typical trajectory and composition (coma, nucleus) of a comet. How did Brahe, Newton, and Halley contribute to our knowledge of comets? To paraphrase Bill's and David's questions, why do comets matter to us? Do they figure in our daily lives?

How many comets do we know about? How many likely exist?

Where do comets originate? How do we know? How does solar wind influence comets?

What sorts of matter do comets carry to earth? Why does that concern us?

What are short-period comets? Long-period comets? How do their orbits differ? How do their origins differ?

Where is the Kuiper Belt? How far away? The Oort Cloud? How far away? Which bodies originate in the Kuiper Belt? Which in the Oort Cloud? What is the scattered disk? Why does it matter?

Again, how big is an AU? What determines an AU's length?

What are planetesimals? Whence come they?

What are plutinos? Whence come they?

What is Eris? When was she discovered? What do we know about her? What and where are Centaurs?

Describe the Oort Cloud, inner and outer, and shape. How big is it in comparison to Earth? How far away in AUs is the Oort Cloud? How do we know it exists?

The Edge of the Solar System

Where is the edge? What are the two definitions? When did *Voyager I* leave our Solar System?

What is the *heliosphere*? The *heliopause*? (What a glorious word!) How might we know when *Voyager I* crossed the heliopause? How do we define *interstellar space*?

What does *Voyager's* golden disk contain? Why?

Living Dangerously

What happened in Tunguska, Russia, in 1908? In Chelyabinsk in 2013?

How likely is it that we here in Evansville will be hit by a meteorite or asteroid?

Who monitors near-Earth object? To what end?

What are Amors, Apollos, Atens, and Atiras? How do their origins and orbits differ?

Examine the lists and graphs on pp. 138-141: how likely is it, according to these data, that within this century we will suffer a major hit from a Near-Earth Object of sufficient speed and size to produce huge impact on the Earth with repercussions lasting more than 50 years?