Babylon to the Big Bang: The Rest of the Journey

Peter Watson

This series of talks will carry on where the first part left off. We will step out beyond the solar system, understand stars, galaxies and finally speculate about the universe itself. The talks will be illustrated by many images, and whenever possible I will use simulations to show how complex ideas can often be simply visualized. Statutory warning: the talks will follow the broad outline below, but topics may flow into the following time-slot. To find slides for the talks go to LinR's class notes page.

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1. **The Birth and Death of Stars.** Like humans, stars have a definite life-cycle, being born in stellar nurseries, going through an often tumultuous youth to respectable adulthood. Unlike humans, the death of stars in supernova is the most spectacular part of their life.

2. **Beeps, flashes, bangs and bursts**. There are a variety of extraordinary objects out there. We more or less understand pulsars, which produce regular pulses of radiation, and even black holes have entered the popular imagination, but gamma-ray bursters, the most energetic objects in the universe defy explanation.

3. **Galaxies and beyond.** Images of the great spiral galaxies are almost the best known symbol of astronomy. What are they like, and how did they get that way

4. **Physics as a Creation Myth:** How Big is it? Finding out how big the universe actually is has always been the most difficult problem for astronomers. For 150 years we have known it is not infinite in size, but it was one of the greatest triumphs of the 20th century to measure it properly and find it is actually growing.

5. **Physics as a Creation Myth: The Big Bang.** Not only has the idea provided the genesis of one of the most popular sitcoms of all time, but it provides the benchmark for all our cosmology. The most disturbing discovery is the realization that most of the universe is not matter as we know it. Dark matter and dark energy are mysterious ideas floating around on the periphery of science.

6. **Beyond the Big Bang.** We have been speculating about how the universe began and how it (and even whether) it will end. We can actually begin to answer some very profound philosophical questions, and even see many echoes of mythological ideas in recent theories of the universe.