

VIEWS OF THE COSMOS

Institution: University of the Sciences, Philadelphia

Instructors: Paul Halpern and Roy Robson

Text: Course Pack of Selected Readings

Students will be evaluated by the following criteria:

Midterm: 25%

Final: 25%

Group Project: 25%

Course Journals: 15%

Participation: 10%

Discussion is an extremely important element of this course. Therefore attendance is critical. Consequently, note that students who miss 3 lectures or more, unexcused, will receive a zero grade for participation.

Plagiarism, in an exam or paper, will result in a zero grade.

CLASS SCHEDULE

Week Starting:	Monday	Wednesday	Friday
1	January 17 Introduction	Creation Stories (Navaho, Mayan)	Dance of Shiva (Halpern)
2	January 24 Guest Speaker: BILLY GRASSIE	Cosmos and History (Eliade)	Lao Tzu
3	January 31 Hindu Sutras	Buddhist Sutras	Jainist selections
4	February 6 Pythagoras	Timaeus (Plato)	Aristotle
5	February 13 Genesis	Quran	Augustine, Origen
6	February 20 Kabbalah	TRIP TO ART MUSEUM	Gnostics
7	February 27 Copernicus	Video: Cosmos, "Kepler"	Galileo
8	March 6 Newton	Review and Group Project Discussion	MIDTERM
9	March 13 SPRING BREAK	SPRING BREAK	SPRING BREAK
10	March 20 Einstein and the Fourth Dimension	Guest Speaker: PETER ROSE	Video: Nova, "Einstein"
11	March 27 The Big Bang	Brief History of Time	Video: "A Brief

			(Hawking)	History of Time"
12	April 3	God and the New Physics (Davies)	The Dancing Wu Li Masters (Zukav)	Video: "Changing Models of the Universe"
13	April 10	How Large is God? (Templeton, ed.)	Anthropic Principle (Barrow and Tipler)	Guest Speaker: CHARLES TOLBERT
14	April 17	Future of Man (Teilhard) End of Days (Robertson)	Omega Point (Gribbin)	NO CLASS (Religious Holiday)
15	April 24	GROUP PROJECTS	GROUP PROJECTS	FINAL

COURSE DESCRIPTION: VIEWS OF THE COSMOS (HU335, PY335)

Prerequisite: Intellectual Heritage II (IH202)

Satisfies History/Literature or World Culture Core Requirement

This course will explore how humans have sought to understand the creation of the world. By surveying many perspectives--ancient and modern, Eastern and Western, religious and scientific--the professors will help students investigate the relationships between humanity and the cosmos. The course will focus on both common and distinct features of religious beliefs (Greek, Babylonian, Mayan, Hindu, and Judeo-Christian, for example), as well as their relationship with various contemporary models of the universe. Drawing from classical texts in addition to recent critical works, we will look at how these religious and philosophical descriptions often parallel the Big Bang, Steady-State, Inflationary and other cosmological theories. Students might compare, for example, the physicist Edward Tyron's vision of the cosmos as a quantum fluctuation with the Kabbalistic idea of the emanation of the universe through the ten Sephiroth, and the Hindu conception of bubbles endlessly rising from a stream. Or, they might contrast the description of the end of the world in Revelation with the thermodynamic concept of Heat Death. Throughout the course, religious and scientific thought will be presented in tandem, emphasizing the importance of dialogue among various points-of-view.

As a scholar of Russian religious history, Roy Robson will point out how today's notions have germinated over time from the rich soil of tradition. Paul Halpern, as a research physicist specializing in cosmology, will ensure that students will be provided with the scientific background and access to resources required for them to appreciate the twists and turns of the current dialogue.

The course will begin with a description of how early humankind looked to the stars for guidance. We will discuss Babylonian astrology and ask the students to ponder how the ancients viewed the heavens as both a source of wonder and a reservoir of divine power. Comparisons will be drawn with Native American, Aboriginal and other early

conceptions of the heavenly dome. Creation myths will be illustrated through art and music.

This will lead into a discussion of classical Greek conceptions of the cosmos, including the Pythagorean notion of "harmony of the spheres." Students will read excerpts from Plato's *Timaeus* and other essential writings. Next, we will examine the idea of reincarnation - the birth-death cycles that form an essential part of Hinduism, Jainism and Buddhism. Using excerpts from primary sources and from religious historian Mircea Eliade's classic text, *The Myth of the Eternal Return, or Cosmos and History*, we will explore the theological and scientific implications of the idea of eternal cosmic repetition. We will debate the question, "How might God be conceived in a universe of infinite cycles?" Students will be presented with their first glimpse of the modern oscillating universe model.

Then we will begin our examination of Jewish, Christian and Islamic conceptions of the cosmos, particularly of its creation and eventual demise. Students will read and discuss excerpts from *Genesis*, *Daniel*, *Revelation* and the *Koran*. We will probe for similarities in these accounts, and analyze critical differences. Presented with traditional interpretations of biblical accounts, such as that provided by St. Augustine, students will be asked to offer their own explanations. We will place these notions in the context of scientific accounts of evolution and eventual world annihilation.

The next segment of the course will concentrate on the mystic tradition in Christianity and Judaism, including Gnostic and Kabbalistic views. Analogies will be drawn between these models of creation and contemporary scientific approaches. Pressing forward in this historical overview, we will look at the impact of the Renaissance and Enlightenment on astronomy. We will discuss the conflict between Bruno the Catholic and Copernican views of Earth's role in the Solar System, and detail the dilemmas faced by Bruno and Galileo.

Then we will examine how the spiritual backgrounds of Kepler and Newton impacted on their science. We will spend a brief time summarizing Newton's laws of motion and their impact on the desire to create all-encompassing "natural laws" of the universe.

The life and work of Einstein will be the next topic of study. Students will begin to explore theories of special and general relativity. Einstein's religious beliefs, particularly his perception that God would design a universe to be simple and elegant, will be discussed in the context of his work.

This will lead into a discussion of Hubble's discovery of an expanding cosmos. We will weigh evidence for the Big Bang theory and its alternatives, such as the Steady State. Moreover, students will investigate the theological implications of each of these models. For example, how might the model of a singular cosmic beginning be compared with the biblical view of creation?

The course will take a brief detour from cosmology and spend a week learning about basic developments in particle physics. Science has shown that the study of the very small is a crucial element in the understanding of the very large. In this segment, Eastern religious ideas will be tied in through excerpts from Capra's *The Tao of Physics* and Zukav's *The Dancing Wu Li Masters*.

Next, students will study the inflationary universe theory and other contemporary cosmological approaches. Reading excerpts from *A Brief History of Time*, we will critically examine the cosmological theories of Stephen Hawking. We will also discuss the eternal inflation model of Andrei Linde, the evolutionary universe models of Lee Smolin and Frank Tipler's notions of exploring God and immortality through physical equations.

This will lead into a discussion of the demise of the cosmos. Using Pierre Teilhard de Chardin's work, *The Future of Man*, and John Gribbin's *The Omega Point*, we will explore possible end states of the universe. We will particularly focus on the ideas of Heat Death and The Big Crunch.

In the final sessions of the course, students will be asked to present projects detailing their own interpretations of the nature of the cosmos, exploring both religious and scientific aspects. These projects will be highly individual in nature, integrating art, drama, and other avenues of expression. For example, some students may elect to re-enact the Hindu "Dance of Shiva"-- a theatrical depiction of the endless demise and recreation of the universe, while others may wish to stage dramatic re-enactments of debates between key religious and/or scientific figures.

"Views of the Cosmos" is designed to survey many religious and scientific themes. Throughout the course similar questions will be asked in many different contexts:

- How did the world begin? How did humans come into existence?
- What is the relationship between humans and the cosmos?
- Does human rationality play a part in creation and understanding the cosmos?
- Where do the thinkers examined turn for truth--tradition, mysticism, quantification?

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