

# Our Place in the Universe MOOC Syllabus

## WEEK 1 Humans and the Cosmos

### 1.1 How Significant Are We?

- How Significant Are We (1)
- How Significant Are We (2)

### 1.2 Patterns in Nature

- What Patterns and Events Can We Observe in Nature?
- Are There Connections between Humans and the Heavens?
- Why Do the Sun, the Moon and the Stars Move?
- Astronomy is an Oldest Science

### 1.3 Celestial Bodies: Why Are They There?

- What Can be Learnt from the Sun's Shadow?
- The Four Special Days of Season Changes
- Why Do the Sunrise and Sunset Positions Change?

### 1.4 Ancient Models of the Universe

- What Are the Shapes of the Earth and the Heaven?
- How Did People Discover that the Earth is Not Flat?

## WEEK 2 Changing Perspectives of the Shape of the Earth

### 2.1 Turning of the Heavens

- The Pole Star
- The Pole of Heaven

### 2.2 A Spherical Earth

- How Can We Define Directions and Specific Locations on Earth?
- Looking at the Earth with a New Perspective: The Spherical Model

### 2.3 The Sun's Journey through the Stars

- The Sun's Journey in the Celestial Sphere
- The Zodiac Constellations
- The Stars and the Seasons
- The Ecliptic and the Seasons
- How Do We Tell the Positions of Stars on the Celestial Sphere?

### 2.4 A Two-sphere Universe

#### A Two-Sphere Universe Model

- How does the Two-sphere Universe Model Show the Motion of the Sun and Stars?

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## Special Feature: The Armillary Sphere

- How did the Armillary Sphere Come About?
- How Does the Armillary Sphere Work?
- Making Measurements with the Armillary Sphere

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## **WEEK 3 The Mysterious Patterns of Cosmic Objects**

### **3.1 Dance of the Moon**

- Dance of the Moon
- Determining the Size and Distance of the Moon
- How Does the Sun Affect the Phases of the Moon?
- Lunar Eclipse
- Two Different Lengths of a Month

### **3.2 The Calendar**

- Star Calendar
- Different Calendars of the World

### **3.3 The Five Wanderers and the Seven Luminaries**

- The Five Wanderers and the Seven Luminaries
- The Motions of the Planets
- The Stories of the Two Brightest Planets: Venus and Mars
- The Planets in the Grand Scheme of the Universe

### **3.4 The Change in Positions of Stars**

- The Uneven Seasons
- Why is the Pole Moving? (1)
- Why is the Pole Moving? (2)

## **WEEK 4 From An Earth-Centered to A Sun-Centered Universe**

### **4.1 The Language of Mathematics in Astronomy**

- Cycles Upon Cycles
- Cosmology According to Aristotle

### **4.2 How Big is the Earth Compared to the Universe?**

- The First Measurement of the Size of the Earth
- The First Measurement of the Distance of the Sun
- The First Estimation of the Size of the Universe

### **4.3 The Post Ptolemy World**

- The Age of Islamic Science
- Islam and the Awakening of Science in Europe

### **4.4 The Copernicus Revolution**

- The Man Who Moved the Earth and Stopped the Sun
- Copernicus' Sun-centered Universe

### **4.5 The Legacy of Copernicus**

- A Milestone in Astronomy - Copernicus' Heliocentric Model
- Controversies of the Copernican Theory
- What We Learned from Copernicus?