

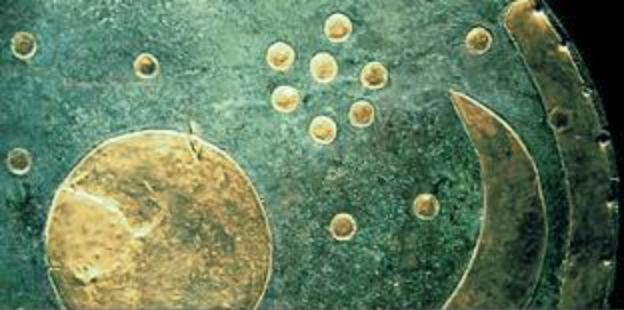
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Our Place in the Universe

Sun Kwok
Faculty of Science



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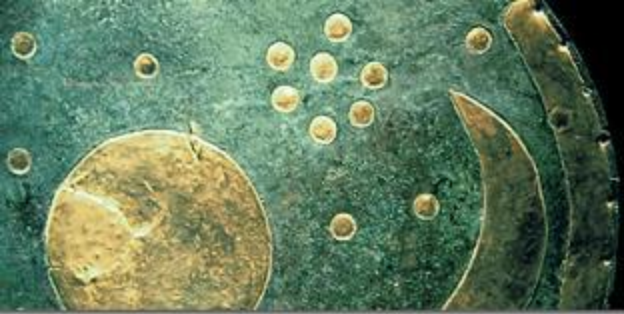
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Our Place in the Universe



About this Course

- Changing perceptions of our place in the universe as the result of astronomical development.
- Illustration of the development of the scientific method and how science has influenced the evolution of our philosophical thinking and cultural development;



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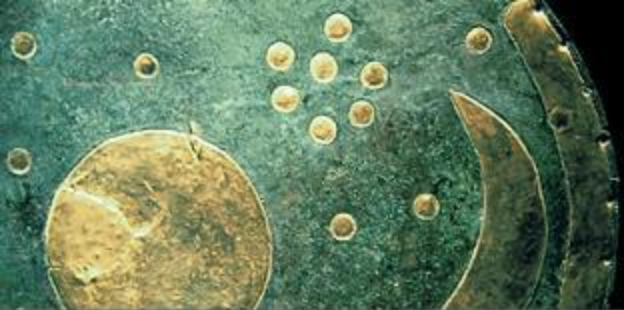
Our Place in the Universe



How significant are we?

- Relative position: are we in the centre of the Universe?
- Spatial scale: how large is our world in the whole Universe?
- Temporal scale: how long have we existed in the history of the Universe?
- Are we special or unique? Are there others who are like us or more advanced than us?

How did we come to our present understanding of our place in the Universe?



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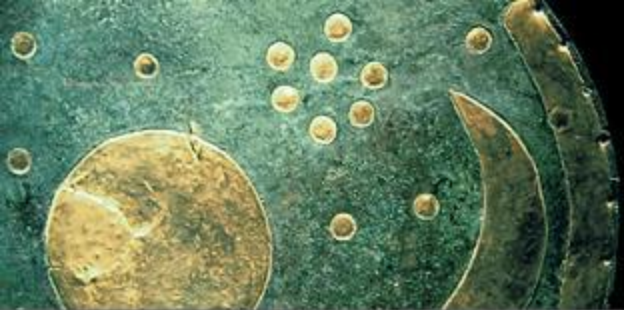
- The presence of celestial objects made us wonder about our existence
- Why do the Sun, the Moon, the stars, and the planets move in such a way?
- How was the world created? What is the structure of the cosmos? What is our place in the Universe?
- Our understanding of these questions have changed greatly over the millennia, and our quest is ongoing
- These changes happened over great obstacles of bias, prejudice, and the pioneers were subjected to ridicule and persecution.
- The triumph of reason over dogma represents the greatest achievement of men.

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Chapter 1 Humans and the Sky



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Ancient civilizations' view of the universe

- Celestial objects and events were important to ancient men.
- Our ancestors took great interest and took incredible amount of patience and diligence to observe and measure the celestial objects
- Celestial objects have regular, periodic motions but their patterns *are not simple*
- Is there a deeper meaning behind these patterns?

Chapter 2

Effects of Celestial Motions on Human Activities

- Apparent motion of the Sun on agriculture and calendar development



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Chapter 3
Rethinking
Aristotelian
Physics



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Chapter 4 The awakening of Science



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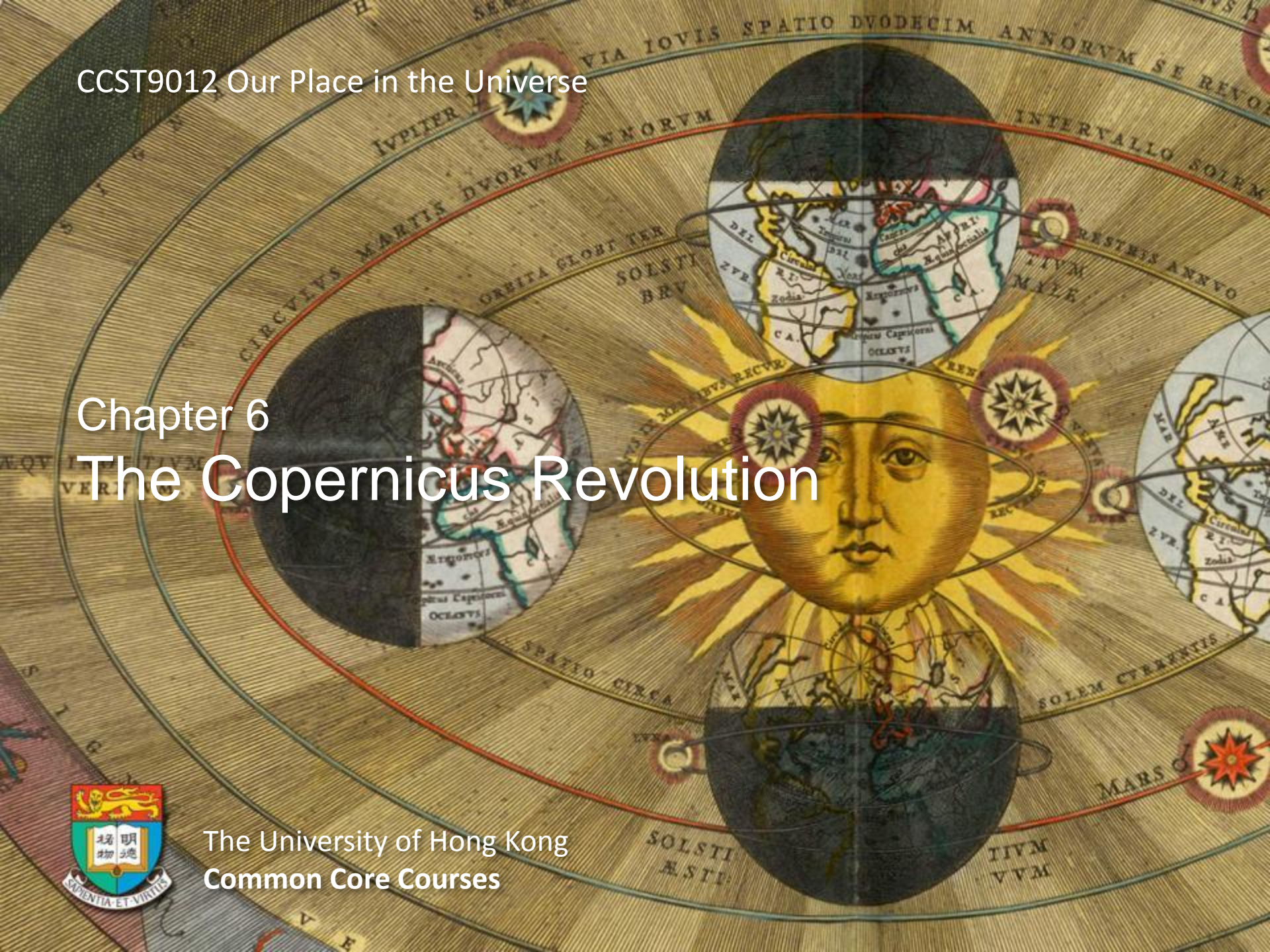
Chapter 5

Apparent motions of Planets



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Chapter 6 The Copernicus Revolution



Chapter 7

The emergence of science
and the scientific method

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Chapter 8
Unification of terrestrial
and celestial motions



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Chapter 9

The Nature of Science and the Exploration of the cosmos



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Chapter 10

Origin of chemical elements and Modern Development of Astronomy



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Connections between stars and us

- The Sun and the stars are made up of the same chemical elements as on Earth
- Physics is universal throughout the Universe
- These elements are detected back at least 10 billion years. Chemical synthesis has started long ago.
- Every atom in our body was made in a star. We are all made up of stellar material

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Chapter 11

History of the Earth and the Expansion of the Scale of Time

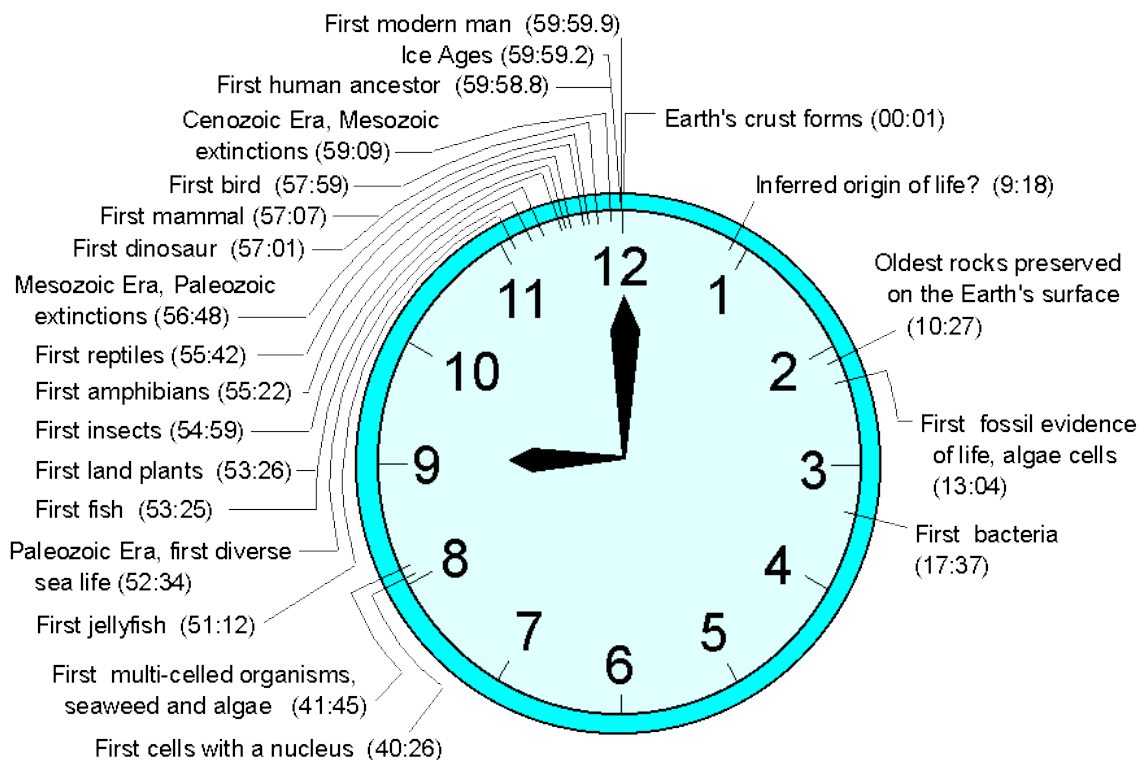


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Changing perceptions

- The Earth (4.6 billion years) and the Universe (>12 billion years) are old
- The earth is changing and evolving, both geologically and biologically
- Human beings are relatively new comers in the history of the Earth.



4.6 billion years in one hour

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Chapter 12
Origin of life and
the existence of extraterrestrial life



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