

Lecture 3:  
*Imagining other Worlds*

Astronomy 141 – Winter 2012

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This lecture reviews the cultural history of the question of life on other worlds.

Our imaginings about other worlds and life on them is as old as our study of the heavens.

The Copernican Revolution re-kindled an interest in other worlds in the west, an idea excluded by Aristotelian views of the world.

Our modern notions of extraterrestrial life have numerous origins, none very scientific.

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About 6000 stars are visible to the naked eye on moonless nights over the course of a year.

Nearly 200 Billion stars make up our Milky Way Galaxy.

We've always wondered what they were...



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The first recorded ideas about other worlds come from ancient Greece



Thales and his student Anaximander (c. 600 BC)

Heavens composed of *physical objects*.



Democritus (c. 460 – 370BC)

Matter composed of atoms with empty space in between, ruled by natural laws.

Infinite universe with an infinite number of worlds.

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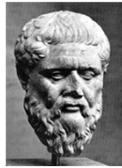
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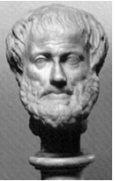
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Plato and his student Aristotle denied the existence of other worlds.

The Earth was unique and unmoving at the center of a finite Universe.



Different laws governed the Heavens and the Earth:



Earth: place of rest, change, and decay

Heavens: place of eternal, perfect motion

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Early non-western imagining of other worlds exist but are relatively rare.



*Taketori Monogatari*  
(Tale of the Bamboo Cutter)  
10<sup>th</sup> century Japan



*Thousand and One Nights*,  
*Adventures of Bulukiya*  
14<sup>th</sup> century Arabia

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Revival of the idea of other worlds came with the Copernican Revolution

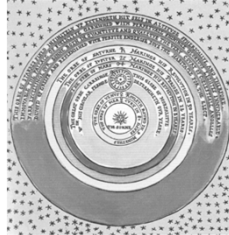


Nicolaus Copernicus (1473-1543)

Earth was one of 6 planets orbiting the Sun

Sir Thomas Digges (1546-1595)

Realized that the Copernican system permitted an *infinite* Universe with an *infinite* number of stars.



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Giordano Bruno (1548-1600) was a famous (but misunderstood) early proponent of other worlds.



Motivated by a mix of philosophies and the Copernican system.

*On the Infinite Universe and Worlds* (1584)

Proposed each star was like the Sun with its own system of planets.

*"This space we declare to be infinite, since neither reason, convenience, possibility, sense-perception nor nature assign to it a limit. In it are an infinity of worlds of the same kind as our own."*

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Early depictions of alien life were used as a vehicle to critique life on Earth



Cyrano de Bergerac (1619-55)  
*States and Empires of the Moon* (1657)

Satire on 17<sup>th</sup> century French society

Voltaire (1694-1778)  
*Micromégas* (1752)

Micromégas, a 20 mile tall visitor from Sirius and his companion from Saturn, marvel at man's smallness.



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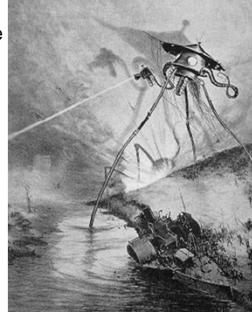
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H.G. Wells' *War of the Worlds* (1898) is the archetypal depiction of aliens as invaders.

Martians invade the Earth to escape their dying planet.

Ultimately stopped by terrestrial diseases to which the Martians had no resistance.

Resonated with British anxieties on the decline of British imperialism



Henrique Corrêa (1906)

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Orson Welles' *War of the Worlds* radio broadcast, Oct 30, 1938

Martians invade New Jersey!

First half was a fake newscast so realistic it caused a near panic among some listeners.

Resonated with anxiety in the US about increasing tensions in pre-World War II Europe.



Orson Welles

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*War of the Worlds* (1953, George Pal)

First film adaptation, winning an Oscar for special effects.

Moved the dramatic focus to 1950s Los Angeles.

Incorporated stock footage of WWII combat and destruction.



[Paramount Pictures]

Strongly influenced by post-WWII anxieties about atomic war.

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*War of the Worlds* (2005, Steven Spielberg)

The Martians return to New Jersey!

The tone of the story reflected post-9/11 anxieties about terrorist attacks against the United States.

Other variations on this theme:  
*Independence Day* (1996)  
*Mars Attacks!* (1996)



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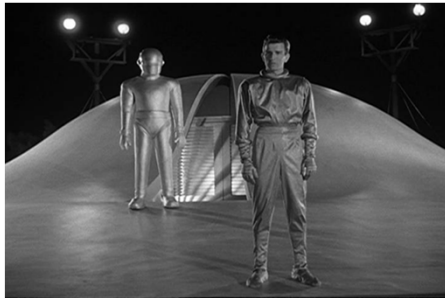
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Another common depiction is highly evolved, technologically advanced super-beings.



*The Day the Earth Stood Still* (1951)

[20<sup>th</sup> Century Fox]

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A parallel theme imagines super-advanced aliens as the agents of human development.



*2001: A Space Odyssey* (1968)

Notable for its very realistic depiction of human spaceflight.

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The "gray alien" is a cultural icon deeply ingrained in the popular imagination.



Large head (bigger more evolved brain?)

Large, lidless oval eyes

Gray, hairless skin

Thin body with long, spindly limbs  
(adapted to low gravity?)

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Our imaginings tell us more about ourselves than about life on other worlds.

Our hopes...

our nightmares...

and our goofy sense  
of humor...

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