

Astronomy 102 - “Exploring the Cosmos”

Mon Thu 13:00-14:20 EII 167



Professor: Office hours:	Chris Pritchett (Elliott 215) - pritchet@uvic.ca Mon Thu 14:30-15:30 – or email for an appointment															
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Lecture Notes:	On the above web site															
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Course Content:	Chaisson Ch 28-16 – Stars, Galaxies, the Universe (but backwards)															
Assignment	<i>See “Getting Started” on class web site. First assignment due Mon Sep 15. Read Ch. 3. Connect to Facebook group. Register clicker. Go to lab.</i>															

Introduction

- Light and Distance [AT 3.1-3.3]
- Temperature [AT 3.4]
- Doppler Effect [AT 3.5]
- Angular Measure [AT 1.3, box p 11]

Galaxies and Cosmology Introduction

- The Milky Way [AT 23 - just a summary - use notes]
- Historical Intro [best to use notes for this]
- Star counts [AT 23.2]
- Parallax [AT 17.1]
- Pulsating Variables [AT 23.2]
- Shapley and the size of the Milky Way [AT 23.2]
- Dust, Trumpler, star counts [-]
- Galaxy Velocities [AT 24.3]
- Nature of Nebulae and the Great Debate [AT 23.2]
- Hubble's resolution of the problem [a few sentences at the end of 23.2]
- Expansion of the Universe [AT 24.3]
- Dark Matter [AT 23.6, 25.1]

Galaxies and Cosmology - the Big Bang

- The Hubble expansion, misconceptions, age etc [AT 26.2]
- Temperature of Universe [AT 27.2 part]
- Evidence for a Hot Big Bang ...
- Big Bang Nucleosynthesis [AT 27.3]
- Structure of Atoms
- Fusion [AT 16.6]
- Cosmic Background Radiation [AT 26.7, 27.6]
- Blackbody Radiation [AT 3.4]
- Inflation and the Horizon Problem [AT 27.4]

Cosmology - After the Big Bang

- Cosmological Principle [AT 26.1]
- Fate of the Universe [AT 26.3-26.5]
- Supernova Cosmology and Dark Energy [AT 26.5-26.6]
- Flatness Problem - Inflation revisited [AT 27.4]

Galaxies

- Milky Way [AT 23 - parts only]
- Galaxy Classification [AT 24.1]
- Hydrostatic equilibrium [AT 16.2]
- Black Holes [AT 22.5-22.8]
- Supermassive black holes [AT 23.7, 25.4]
- Radio Galaxies and AGN's [AT 24.5, 25.4]
- Distribution of Galaxies in Space [AT 24.2, 25.5, 26.1]
- Galaxy and Structure Formation [AT 27.5, 25.3]

Stars

- Physical Properties of Sun [AT 16.1]
- Solar Neighbourhood [AT 17.1]
- Stellar Temperatures and Spectra [AT 17.3]
- Stellar Sizes [AT 17.4]
- Hertzsprung-Russell Diagram [AT 17.5]
- Stellar Masses [AT 17.7]
- Other Stellar Properties [AT 17.8]
- Evolution - Leaving the Main Sequence [AT 20.1]
- Evolution of a Solar Star [AT 20.2]
- Death of Low Mass Stars [AT 20.3]
- Evolution of Massive Stars [20.4]

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Web site and lecture notes

- <http://www.astro.uvic.ca/~pritchet/Astr102>
- notes contain pictures, movies, some key concepts, but ...
- **more will be said in class**
- approximately 10% of the exam questions will be based on material not in the textbook or notes but discussed or mentioned in class
- notes will be online after chapter completed

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Assignments

- Mastering Astronomy access required (bundled with the Astr 102 textbook)
 - <http://www.masteringastronomy.com/>
- Assignments “usually” due Mondays at 23:59.
 - Questions may be randomized, numerical questions may use different numbers.
- First assignment due Monday Sep 15th 23:59
 - not a “real assignment”
 - later assignments will have only 1 correct answer and may not have hints

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Labs

- Make sure you are enrolled in a lab section
- Labs start Sep 15/16th – night lab 8:30pm, meet in BWC A506 for this lab only
- Other labs are held every 2-3 weeks, and are held in A111 at your regular time
- **You cannot pass the course without also passing the lab!**

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i>clicker

- ***Always bring your i>clicker to class!***
 - Half the marks for participation (i.e. giving an answer, any answer)
 - Half the marks for the correct answer
 - You will be allowed to miss 4 questions before it counts against you
-
- If N is the # of questions, M is the # of questions to which you respond, and C is the # for which you respond correctly, then your i>clicker mark is $(M/2 + C/2)/N \times 100\%$ [modify for up to 4 missing answers]

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Social Media

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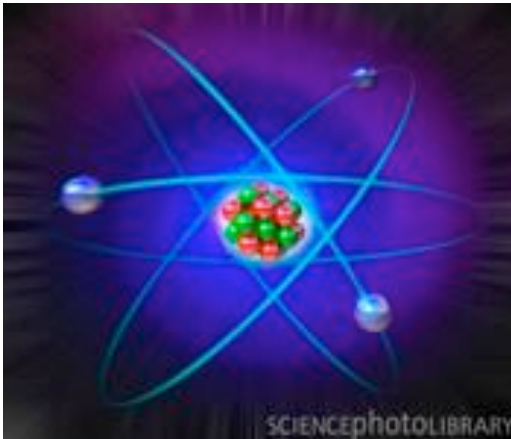
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Course Level:	For non-scientists; hardly any math; no science prereq’s															
Course Content:	Chaisson Ch 28-16 – Stars, Galaxies, the Universe (but backwards)															
Assignment	See “Getting Started” on class web site. First assignment due Mon Sep 15. Read Ch. 3. Connect to Facebook group. Register clicker. Go to lab.															

Course Level



- no prerequisites
- for non-science students
- little or no math
 - example
 - more math in labs
- science concepts introduced as needed
 - Example

“Mastering Astronomy”, Chaisson & McMillan

3 PART

Stars and Stellar Evolution 382

- 16** The Sun: Our Parent Star 384
- 17** The Stars: Giants, Dwarfs, and the Main Sequence 416
- 18** The Interstellar Medium: Gas and Dust among the Stars 444
- 19** Star Formation: A Traumatic Birth 464
- 20** Stellar Evolution: The Life and Death of a Star 490
- 21** Stellar Explosions: Novae, Supernovae, and the Formation of the Elements 516
- 22** Neutron Stars and Black Holes: Strange States of Matter 600

Galaxies and Cosmology 570

4 PART

- 23** The Milky Way Galaxy: A Spiral in Space 572
- 24** Galaxies: Building Blocks of the Universe 602
- 25** Galaxies and Dark Matter: The Large-Scale Structure of the Cosmos 634
- 26** Cosmology: The Big Bang and the Fate of the Universe 660
- 27** The Early Universe: Toward the Beginning of Time 682
- 28** Life in the Universe: Are We Alone? 706

“Mastering Astronomy”, Chaisson & McMillan



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39	The Early Universe: Toward the Beginning of Time	389
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40	Galaxies: Building Blocks of the Universe	399
40	The Milky Way Galaxy: A Spiral in Space	400

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	Evolution	400
39	Galaxy Evolution: How the Universe Began	400
39	Galaxy Evolution: The Life and Death of a Star	400
39	Star Formation: A Dramatic Birth	401
39	The Interstellar Medium: Gas and Dust among the Stars	404
39	The Solar System: Birth and the Main Sequence	410
39	The Sun: Our Final Star	411

Stars and Stellar Evolution 398

Introduction

- Light and Distance [AT 3.1-3.3]
- Temperature [AT 3.4]
- Doppler Effect [AT 3.5]
- Angular Measure [AT 1.3, box p 11]

Galaxies and Cosmology Introduction

- The Milky Way [AT 23 - just a summary - use notes]
- Historical Intro [best to use notes for this]
- Star counts [AT 23.2]
- Parallax [AT 17.1]
- Pulsating Variables [AT 23.2]
- Shapley and the size of the Milky Way [AT 23.2]
- Dust, Trumpler, star counts [-]
- Galaxy Velocities [AT 24.3]
- Nature of Nebulae and the Great Debate [AT 23.2]
- Hubble's resolution of the problem [a few sentences at the end of 23.2]
- Expansion of the Universe [AT 24.3]
- Dark Matter [AT 23.6, 25.1]

Galaxies and Cosmology - the Big Bang

- The Hubble expansion, misconceptions, age etc [AT 26.2]
- Temperature of Universe [AT 27.2 part]
- Evidence for a Hot Big Bang ...
- Big Bang Nucleosynthesis [AT 27.3]
- Structure of Atoms
- Fusion [AT 16.6]
- Cosmic Background Radiation [AT 26.7, 27.6]
- Blackbody Radiation [AT 3.4]
- Inflation and the Horizon Problem [AT 27.4]

Cosmology - After the Big Bang

- Cosmological Principle [AT 26.1]
- Fate of the Universe [AT 26.3-26.5]
- Supernova Cosmology and Dark Energy [AT 26.5-26.6]
- Flatness Problem - Inflation revisited [AT 27.4]

Galaxies

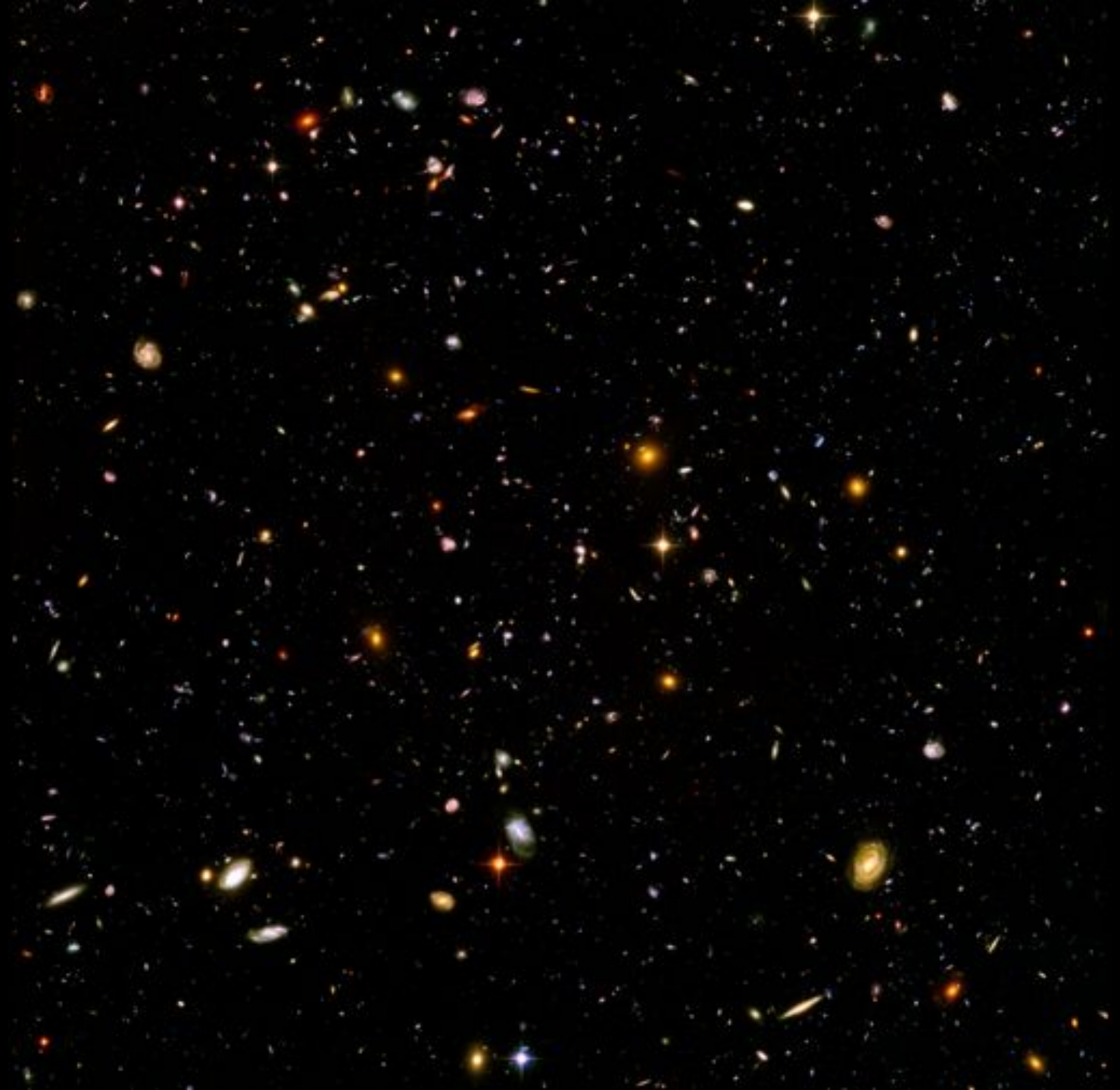
- Milky Way [AT 23 - parts only]
- Galaxy Classification [AT 24.1]
- Hydrostatic equilibrium [AT 16.2]
- Black Holes [AT 22.5-22.8]
- Supermassive black holes [AT 23.7, 25.4]
- Radio Galaxies and AGN's [AT 24.5, 25.4]
- Distribution of Galaxies in Space [AT 24.2, 25.5, 26.1]
- Galaxy and Structure Formation [AT 27.5, 25.3]

Stars

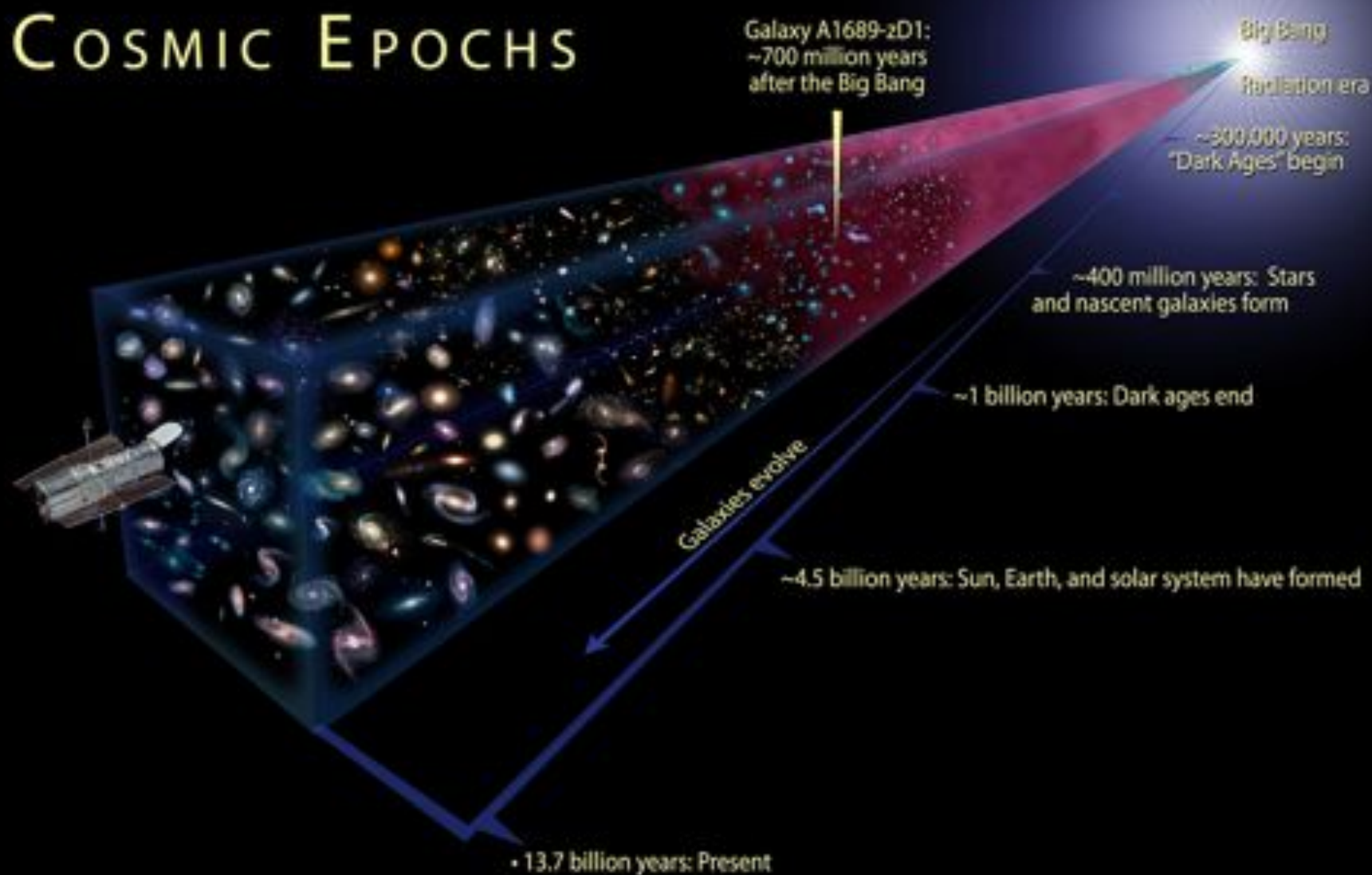
- Physical Properties of Sun [AT 16.1]
- Solar Neighbourhood [AT 17.1]
- Stellar Temperatures and Spectra [AT 17.3]
- Stellar Sizes [AT 17.4]
- Hertzsprung-Russell Diagram [AT 17.5]
- Stellar Masses [AT 17.7]
- Other Stellar Properties [AT 17.8]
- Evolution - Leaving the Main Sequence [AT 20.1]
- Evolution of a Solar Star [AT 20.2]
- Death of Low Mass Stars [AT 20.3]
- Evolution of Massive Stars [20.4]

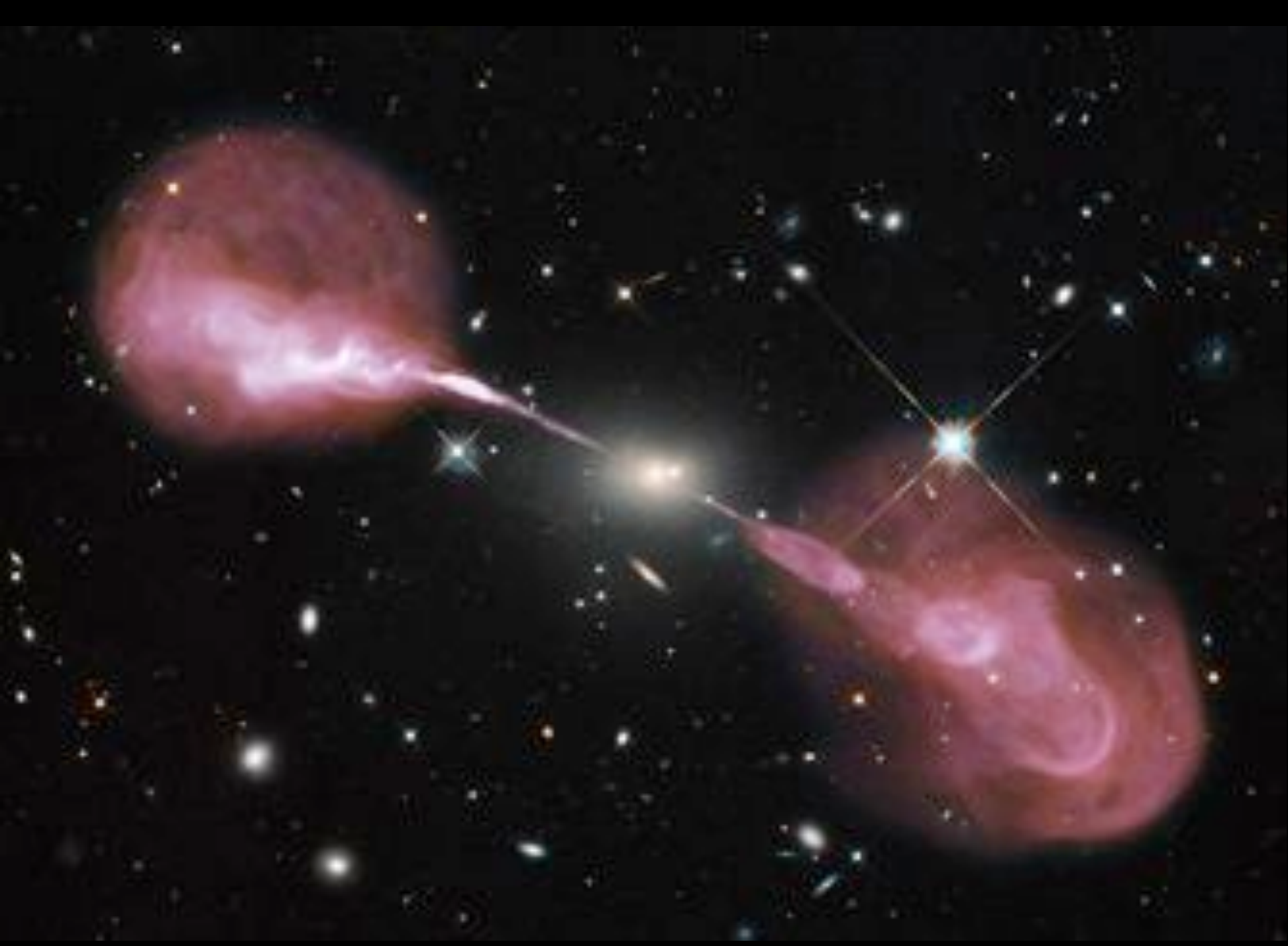


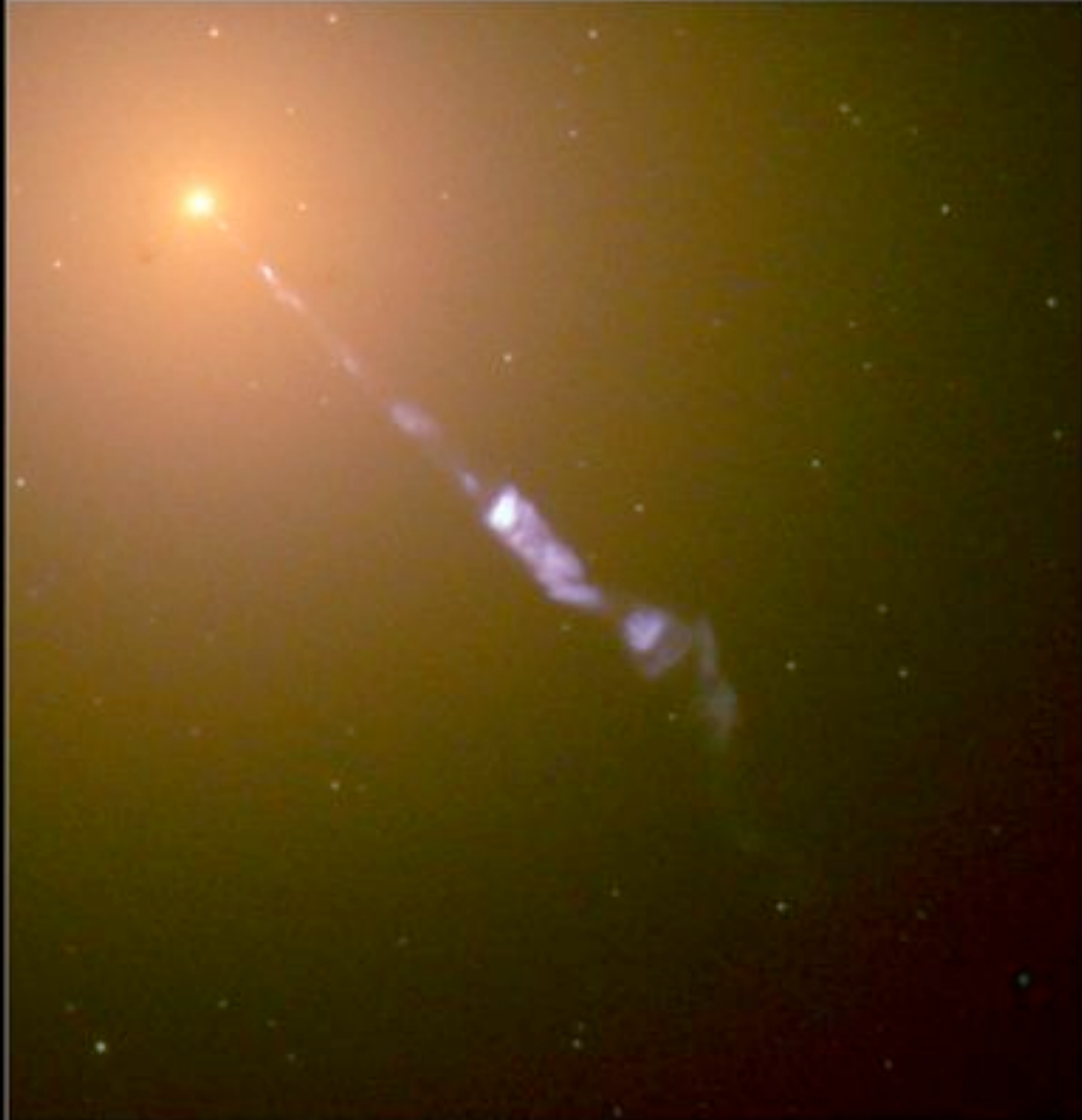




COSMIC EPOCHS



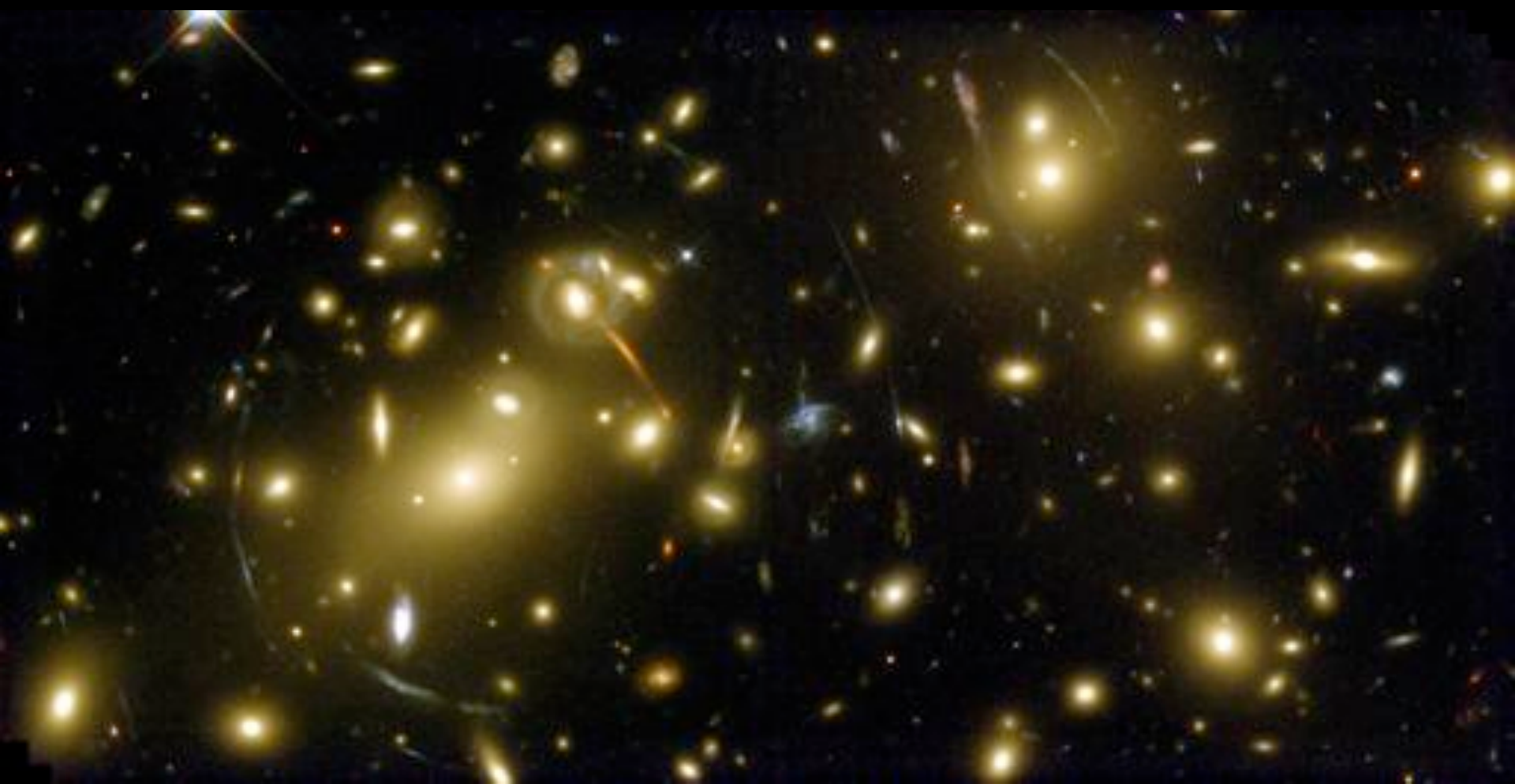


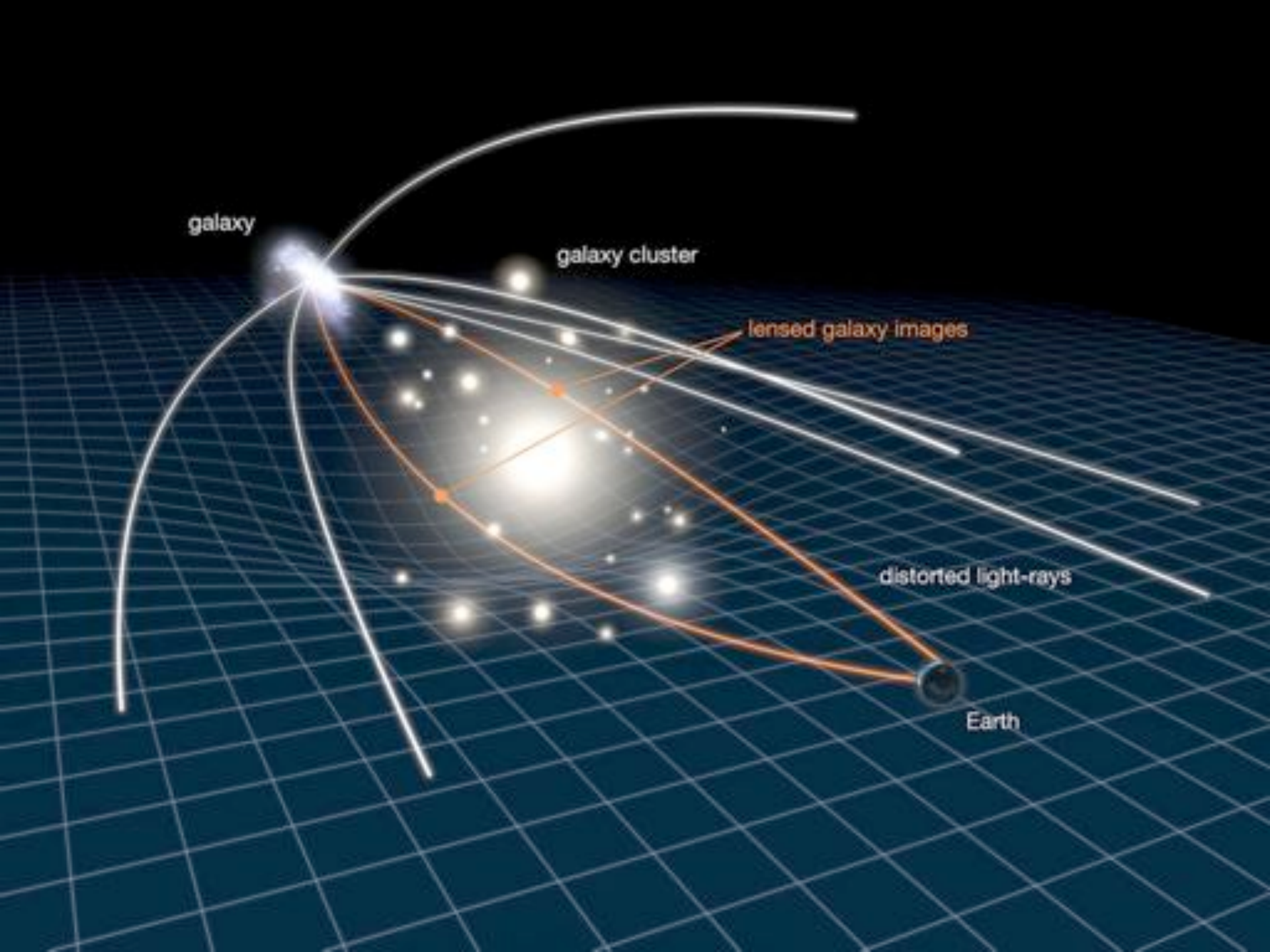


1992

10 light days















Death of the Sun Part I

Courtesy of:

The Wright Center,
Science Visualization Lab -
Tufts University/ D.Berry and J. Palmer



www.spacetelescope.org

Astr 102 Schedule [so far]

Date	Event
Mondays	Assignments “normally” due (23:59)
Mon & Thu	14:30-15:30 Office hours
Mon, Sep 15th	First “assignment” due
Mon/Tue Sep 15/16th	First lab
Thu, Oct 9th	Midterm Exam
Thu, Nov 6th	Midterm Exam

Astronomy 102 - "Exploring the Cosmos"

Mon Thu 13:00-14:20 EII 167



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