Presentations and topics

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Presentations - general instructions (1)

- All of the Master and PhD students should give a 15 min presentation on a topic related to cosmology.
- We will in the following present a list of possible topics, and you may also present your own suggestions.
- Please send your chosen topic along with relevant materials to Prof. Leigh (nleigh@amnh.org) before April 30 for approval.
- After each presentation, there will be 5-10 min for questions.

Presentations - general instructions (2)

- We recommend to do the presentation in English, though it can be in Spanish if otherwise it is not possible to give the talk.
- The slides however should be in English to also introduce the English nomenclature.
- The grade will be evaluated based on:
  - Historical and physical relevance to cosmology
  - Content (is the physics adequately explained in terms of scope and correctness)
  - Proper referencing (give your sources)

General recommendations

- Your slides should not be too crowded.
- Include figures and illustrations that are helpful.
- Try to include formulae and equations where it helps to clarify concepts.
- Explain the material shown on your slides, including figures and equations!

Topics (1)

- Inflationary universe: A possible solution to the horizon and flatness problems (Guth 1981, https://ui.adsabs.harvard.edu/abs/1981PhRvD..23..347G/abstract)
- Primordial nucleosynthesis: successes and challenges - G. Steigman (2006) : http://ned.ipac.caltech.edu/level5/Sept07/Steigman/frames.html
- The Cosmic Microwave Background:The history of its experimental investigation and its significance for cosmology (Ruth Durrer, https://arxiv.org/pdf/1506.01907.pdf)
- Planck 2018 results. I. Overview and the cosmological legacy of Planck (Planck collaboration, https://arxiv.org/abs/1807.06205): for two students

Topics (2)

- An Introductory Review on Cosmic Reionization (John Wise,, https://arxiv.org/abs/1907.06653)
- The Hubble constant - Wendy L. Freedman & Barry F. Madore (2010) : http://ned.ipac.caltech.edu/level5/Sept11/Freedman/frames.html
- Observational probes of cosmic acceleration - David H. Weinberg et al. (2013, http://ned.ipac.caltech.edu/level5/March14/Weinberg/frames.html): for two students
- The Cosmological Constant - Sean M. Carroll (2000): https://arxiv.org/abs/astro-ph/0004075

Topics (3)

- A gravitational-wave standard siren measurement of the Hubble constant (The LIGO collaboration, 2017): https://arxiv.org/abs/1710.05835
- 21-cm cosmology, Pritchard & Loeb (2011): https://arxiv.org/abs/1109.6012
- Thermodynamics and chemistry of the early Universe (Bovino & Galli, https://arxiv.org/abs/1807.05939)
- Mark Dijkstra: Prospects for detecting the first black holes, https://arxiv.org/abs/1807.06221
- Tamera Davis, David Parkinson: Characterising Dark Energy through supernovae, https://arxiv.org/abs/1610.09452

Topics (4)

- First signal from the first stars through 21 cm observations: https://www.nature.com/articles/nature25792 https://www.theguardian.com/science/2018/feb/28/cosmic-dawn-astronomers-detect-signals-from-first-stars-in-the-universe?CMP=share_btn_fb
- A Space Mission to Map the Entire Observable Universe using the CMB as a Backlight (Voyage 2050, K. Basu, https://www.cosmos.esa.int/documents/1866264/3219248/BasuK_Voya cd08-abe9-6aa6-080722763cb6?t=1565184619814)
- Probing the formation of the seeds of supermassive black holes with gravitational waves (Monica Colpi, https://arxiv.org/abs/1807.06967)

Topics (5)

- Inflationary Cosmology: From Theory to Observations (J. Alberto Vázquez, Luis E. Padilla, Tonatiuh Matos, https://arxiv.org/abs/1810.09934)
- Probing the epoch of reionization through C+ and CO lines (http://kiss.caltech.edu/techdev/billion/Report.pdf , http://adsabs.harvard.edu/cgi-bin/bib_query?arXiv:0805.2174 , http://adsabs.harvard.edu/abs/2014MNRAS.443.3506B)