

Intro Cosmology Short Course: Outline June '07

Paul Stankus, Oak Ridge National Laboratory

Lecture 1 Prelude: GR for the Common Man

Calvin and Hobbes' mistake -- Our friend the metric -- Minkowski space and Newton's Laws -- Time dilation and gravitational redshift -- Gravity as curved space

Lecture 2 Expanding Universes

The Hubble expansion -- Homogeneity and isotropy -- Friedmann-Lemaitre cosmologies -- The Robertson-Walker metric -- Cosmological redshift -- Why isn't Brooklyn expanding?

Lecture 3 Cosmological Distances

Proper distance -- Three measures of distance: Co-Moving, Angular and Luminosity -- Generalized light cones -- The extended Hubble relation -- Observed luminosities of distant supernovae

Lecture 4 Spatially Non-Flat Cosmologies

Flat, open, closed -- The critical density -- Older notations-- The Universe I grew up in -- The Friedmann equation -- "Geometry is destiny"

Lecture 5 Inflation, Dark Energy and the Cosmological Constant

Einstein oversimplified -- Cosmological constant: the "leftist" view -- Dark energy: the "rightist" view -- De Sitter spaces -- Inflation in the early Universe -- What a lonely future awaits!

Presentations archived at: http://www.phenix.bnl.gov/WWW/publish/stankus/Intro_Cosmology/

Video available at: <http://www.bnl.gov/video/lectures.asp>

Direct all inquiries to: Paul Stankus; 631/344-4280; stankuspw@ornl.gov ; B510 3-206 BNL