

## Index

### A

#### anisotropy

15.4: Understanding the Variations in the CMB

#### antineutrino

5.1: Measuring the Ages of Objects - Radiometric Dating

### B

#### Beta decay

5.1: Measuring the Ages of Objects - Radiometric Dating

#### big bang nucleosynthesis

5.4: Evolution of Galaxies and the Universe Itself  
16.1: The Formation of the Lightest Elements

### C

#### caustics

12.3: Lensing by Extended Mass Distributions

#### Cepheids

6.3: Standard Candle

#### Coma cluster

8.5: Velocity and Mass Distributions in Galaxy Clusters

#### comoving coordinates

13.3: The Universe is Expanding

#### cosmic microwave background

15.2: Implications of the CMB Temperature and Spectrum

#### cosmological constant

17.2: Candidates for Dark Energy

#### cosmological redshift

13.3: The Universe is Expanding

#### critical density

17.3: The Friedmann Equation and the Fate of the Universe

#### curvature

10.2: Gravity and Curvature  
10.3: What is Curvature?

### D

#### Doppler shift

4.2: Measuring Motion - the Doppler Shift

#### Double Quasar

12.3: Lensing by Extended Mass Distributions

### E

#### Eddington luminosity

11.4: Astrophysical Black Holes

#### Einstein Cross

12.3: Lensing by Extended Mass Distributions

#### Einstein ring

12.2: Lensing by Point Masses

### F

#### false vacuum

16.3: Inflation

#### field of view

3.1: Designing Telescopes Across the Spectrum

#### free fall

10.1: Einstein's Equivalence Principle

#### Friedmann equation

17.3: The Friedmann Equation and the Fate of the Universe

### G

#### galaxy clusters

8.5: Velocity and Mass Distributions in Galaxy Clusters

#### Gedankenexperiment

9.2: Time Dilation

#### geodesic

15.5: Comparing Models and Data - The CMB and the Curvature of Space

#### GPS

10.4: Tests of General Relativity

#### gravitational lensing

12.2: Lensing by Point Masses  
12.3: Lensing by Extended Mass Distributions

### H

#### Hawking radiation

11.2: Spacetime Near Black Holes

#### Hubble constant

13.2: The Hubble Law

#### Hubble expansion

15.2: Implications of the CMB Temperature and Spectrum

#### Hubble space telescope

13.2: The Hubble Law

#### Hubble's law

13.2: The Hubble Law

### I

#### inflation

16.3: Inflation

#### inverse square law

6.3: Standard Candle

### K

#### Kapteyn Model

14.1: Large Scale Structure

#### Karl Schwarzschild

11.2: Spacetime Near Black Holes

### L

#### large hadron collider

8.6: Possible Explanations for the Missing Mass in Galaxies and Clusters

#### light clock

9.2: Time Dilation

#### luminosity

6.3: Standard Candle

### M

#### MACHOs

8.6: Possible Explanations for the Missing Mass in Galaxies and Clusters

#### massive compact halo objects

8.6: Possible Explanations for the Missing Mass in Galaxies and Clusters

#### Mercator projection

10.3: What is Curvature?

#### microlensing

12.2: Lensing by Point Masses

#### modified newtonian dynamics

8.6: Possible Explanations for the Missing Mass in Galaxies and Clusters

#### Mollweide projection

15.1: Observations of the CMB Spectrum

#### MOND

8.6: Possible Explanations for the Missing Mass in Galaxies and Clusters

### N

#### nuclear fusion

5.2: Measuring Ages - Lifetimes of Stars

### O

#### Olbers' paradox

13.4: The Age of the Universe

### P

#### parallax

6.1: Geometrical Methods

#### parsec

6.1: Geometrical Methods

#### Planck length

11.3: Quantum Effects Near Black Holes

#### Planck satellite

15.2: Implications of the CMB Temperature and Spectrum

#### Planck Time

16.4: The Beginning

#### primordial black holes

11.3: Quantum Effects Near Black Holes

#### pulsar

10.6: Wrapping It Up 10 - Curved Spacetime Around Astronomical Objects

### Q

#### quantum gravity

11.3: Quantum Effects Near Black Holes

#### quintessence

17.2: Candidates for Dark Energy

### R

#### radiometric dating

5.1: Measuring the Ages of Objects - Radiometric Dating

#### resolution

3.1: Designing Telescopes Across the Spectrum

### S

#### Schwarzschild radius

11.2: Spacetime Near Black Holes

#### Singularity

11.3: Quantum Effects Near Black Holes

#### spaghettification

11.2: Spacetime Near Black Holes

#### Standard Candles

6.3: Standard Candle

## T

Theory of Everything

[16.4: The Beginning](#)

Time dilation

[9.2: Time Dilation](#)

[11.2: Spacetime Near Black Holes](#)

twin paradox

[9.5: Applications of Spacetime](#)

Type Ia supernovae

[6.3: Standard Candle](#)

## V

vacuum energy

[16.3: Inflation](#)

virtual particles

[11.3: Quantum Effects Near Black Holes](#)

## W

weakly interacting massive particles

[8.6: Possible Explanations for the Missing Mass in Galaxies and Clusters](#)

[16.4: The Beginning](#)

WIMPS

[16.4: The Beginning](#)