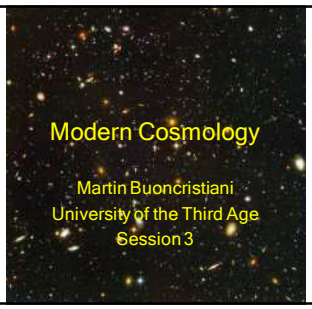
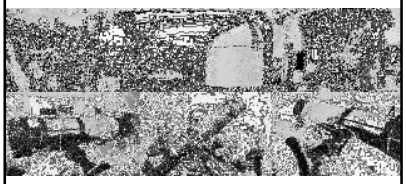


http://ThinkingAndLearningInConcert.org

News from Mt. Burnett Observatory

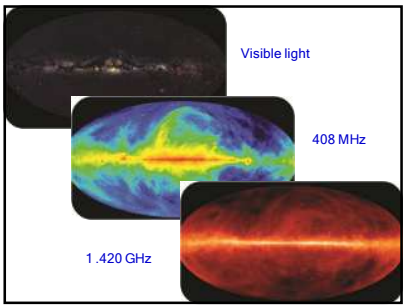


Monash Center for Astrophysics Public Lecture

Prof. Chris Tinney
ARC Professorial Fellow
Department of Astrophysics
School of Physics
University of NSW

The Search for Extrasolar Planets

6pm, 29 March, 2012
Monash University



The priority science objectives for 2012-2021 are:

Cosmic Dawn - searching for the first stars, galaxies, and black holes;

New Worlds - seeking nearby habitable planets;

Physics of the Universe - advancing understanding of the fundamental physics of the universe.

Astronomical Measurements

Time – Solar day / Solar year / Sidereal Time / Seasons

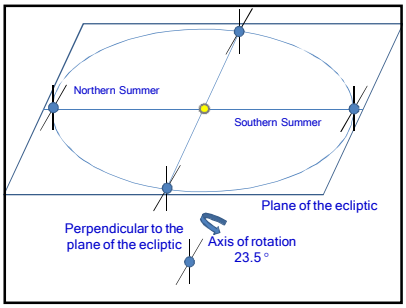
Distance – Terrestrial Measurements / Solar System Measurements
Star distances: Parallax, Variable stars, Red Shift, Radio

Location of stars – Celestial Sphere

Starlight – Luminosity of stars depends on mass

Looking at a star enables determination of its
Temperature, Radius, Luminosity, Mass and Distance from Earth

... and there is more!

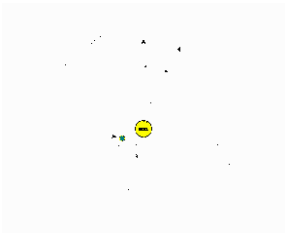


Parallax between 1 AU and about 1000 Ly

Variable stars 100 Ly to 1 ,000,000 Ly

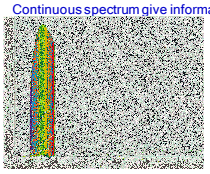
Red shift and Hubble's Law beyond

RADEP (RAdio DEPth) measures all astronomical distances with one technique based on response to radio telescope signal.

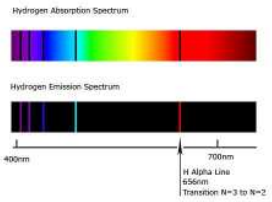


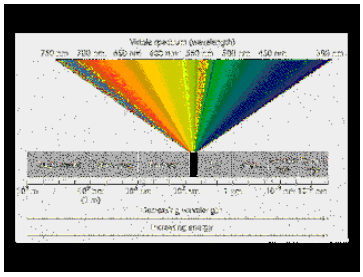
We can learn more about a star by looking at the various wavelengths of light

Continuous spectrum give information about the

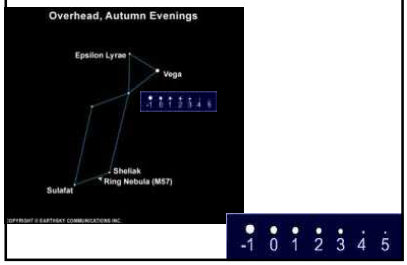


... and the discrete spectrum of atoms is their fingerprint

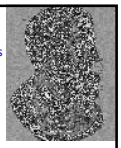




Stars appear with different brightness



Apparent Magnitude of Stars



Magnitude scale was first introduced by Hipparchus (190 BCE to 120 BCE)
"Eyeball" estimate of magnitude
1 for the brightest star
6 for the dimmest star

Later a more quantitative scheme was introduced – the difference between brightest (1) and the dimmest (6) was 100.

a magnitude 1 star is 2.512 tines brighter than a magnitude 2 star. ($100^{1/5} = 2.512$)

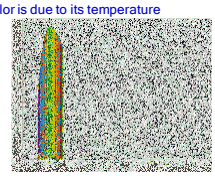
Now brightness is determined optically so the scale is much finer.

Sun m = - 26.8
Full moon m = - 12.6
Venus m = - 4.4
Sirius m = - 1.5
dimmest stars seen by Hubble m = 30

Stars have a different color quality

Image of the double star Albireo which can be observed with a small telescope. The two members of the double star system are very different colors.

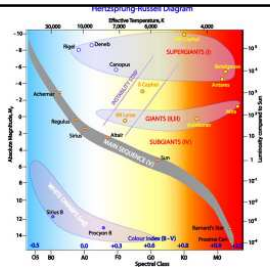
Star Color is due to its temperature



Temperature is related to is mass.

Temperature is related to luminosity

Spectral Class	Informal Name	Surface Temperature, K
O	Blue	≥33.000
B	Blue-White	10,000 – 33,000
A	White	7,500 – 10,000
F	Yellow-White	6,000 – 7,500
G	Yellow	5,200 – 6,000
K	Orange	3,700 – 5,200
M	Red	≤3,700



New Worlds, New Horizons in Astronomy and Astrophysics

Committee for a Decadal Survey of Astronomy and Astrophysics; National Research Council

ISBN: 0-309-15800-1, 324 pages, 7 x 10, (2010)

This is a free PDF downloaded from:

http://www.nap.edu/catalog/12951.html

The Australian Decadal Plan

New Horizons
A Decadal Plan for Australian Astronomy 2006 – 2015

http://www.atnf.csiro.au/nca/DecadalPlan_web.pdf