The Harvard-Smithsonian Center for Astrophysics

Intro – Jonathan McDowell
(Chandra X-ray Center)

Ground Based Astronomy – Warren Brown
(Optical and Infrared Astronomy Division)

Exoplanet Research - Sarah Ballard
(Solar, Stellar and Planetary Division)

Historic Telescope Tour - Jonathan (again)

Lunch Expedition

Chandra Mission Control Center – Jonathan (yet again)

Welcome to the Harvard-Smithsonian Center for Astrophysics (CfA).

We are one of the largest - possibly **the** largest – astronomy research institutions on the planet

(*indeed, as far as we know, in the entire spiral arm*)

The CfA consists of two interwoven institutions, the Harvard College Observatory (HCO) and the Smithsonian Astrophysical Observatory (SAO); its buildings also house the Department of Astronomy of Harvard University.

Here at the CfA we:

- observe the universe, with ground-based telescopes in Arizona, Chile and Hawaii, and instruments in Earth orbit and deep space.
- design, develop and build astronomical instruments, telescopes and space payloads
- carry out theoretical investigations of the planets, Sun, stars, galaxy and universe
- house some of the crucial global services for the astronomy community (ADS, ds9, IAU-MPC, US Simbad-mirror)
- operate NASA's Chandra X-ray Observatory spacecraft for the community

Who we are

Harvard-Smithsonian Center for Astrophysics (CfA)
60 Garden St, Cambridge

Chandra X-ray Center (CXC)

MIT Kavli Institute
1 Hampshire St, Cambridge

Chandra Operations Control Center (OCC)
1 Hampshire St, Cambridge

Harvard College Observatory (HCO)

Smithsonian Astrophysical Observatory (SAO)

1000 staff at CfA, including 400 PhDs, doing all kinds of research
Here are just a few of them

Charles Alcock (Director)

"MACHO" project discovered microlensing

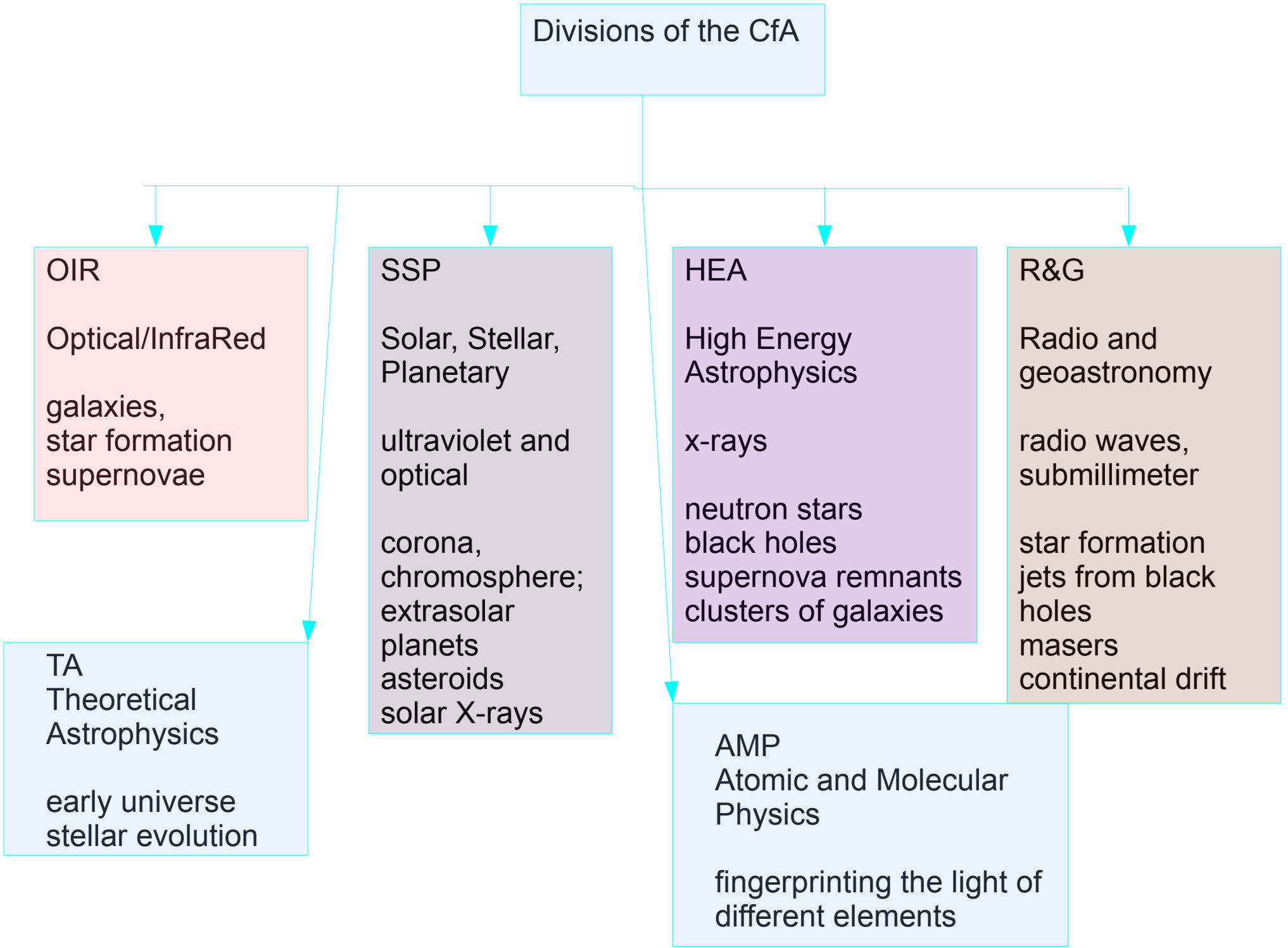
Bob Kirshner – supernova cosmology, discovery of dark energy

Julia Lee – black hole accretion

Dave Charbonneau
Spectrum of an extrasolar planet

Lisa Kaltenegger: understanding the atmospheres of exoplanets

John Huchra
1948 – 8 Oct 2010
observational cosmology


Divisions of the CfA
OIR
Optical/InfraRed
galaxies,
star formation
supernovae
SSP
Solar, Stellar, Planetary
ultraviolet and optical
corona, chromosphere; extrasolar planets
asteroids
solar X-rays
HEA
High Energy Astrophysics
x-rays
neutron stars
black holes
supernova remnants
clusters of galaxies
R&G
Radio and geoastronomy
radio waves, submillimeter
star formation
jets from black holes
masers
continental drift
TA
Theoretical Astrophysics
early universe
stellar evolution
AMP
Atomic and Molecular Physics
fingerprinting the light of different elements

CfA's Early History

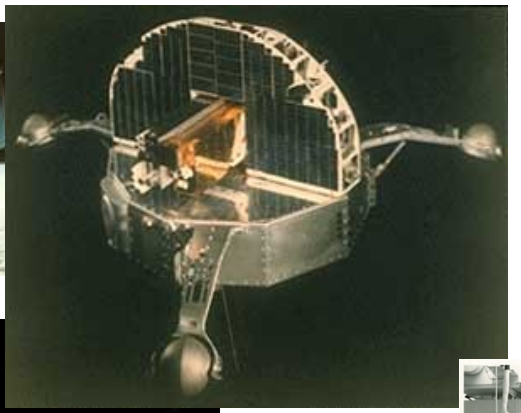
1839 Harvard College Observatory founded

1842 HCO moves to Garden St

1847 The Great Refractor makes first observations
1847 Early daguerrotypes of the Moon
1848 Bond discovers Saturn VII (Hyperion)
1882 Harvard Photometry list of bright stars
1887 Plate surveys begin
1890 SAO founded in Washington, DC
Studies solar energy output

1890 Pickering and Fleming classify star types
1918-1924 Annie Cannon's HD catalog of stellar spectra published
1955 SAO moves to colocate with HCO
1957 Moonwatch project tracks Sputnik and other satellites
1973 SAO and HCO form the CfA
X-ray group joins CfA
1978 Einstein satellite studies X-ray sources
1981 CfA Redshift survey maps the cosmos

The CfA Space Program



Orbiting Solar Observatory – 1962
OAO Celescope – 1968
Gravity Probe A - 1976
Einstein Observatory – 1978
Spacelab 2 IRT - 1985
ROSAT HRI telescope – 1990
SOHO UVCS telescope – 1995
Spartan 201 - 1995
TRACE – 1998
SWAS - 1998
Chandra – 1999
Spitzer IRAC camera - 2003
XRT on Hinode - 2006
Solar Dynamics Observatory - 2010