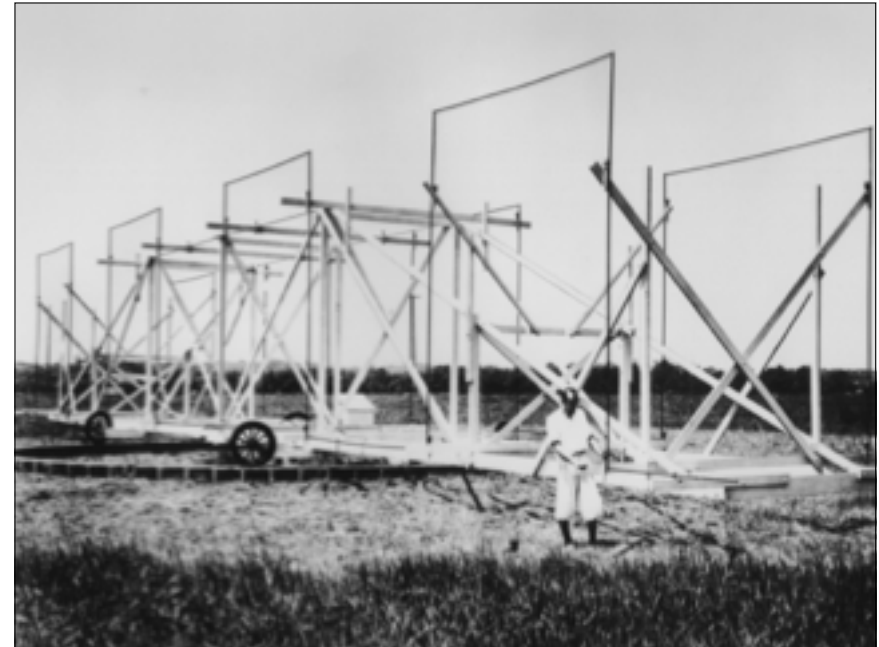


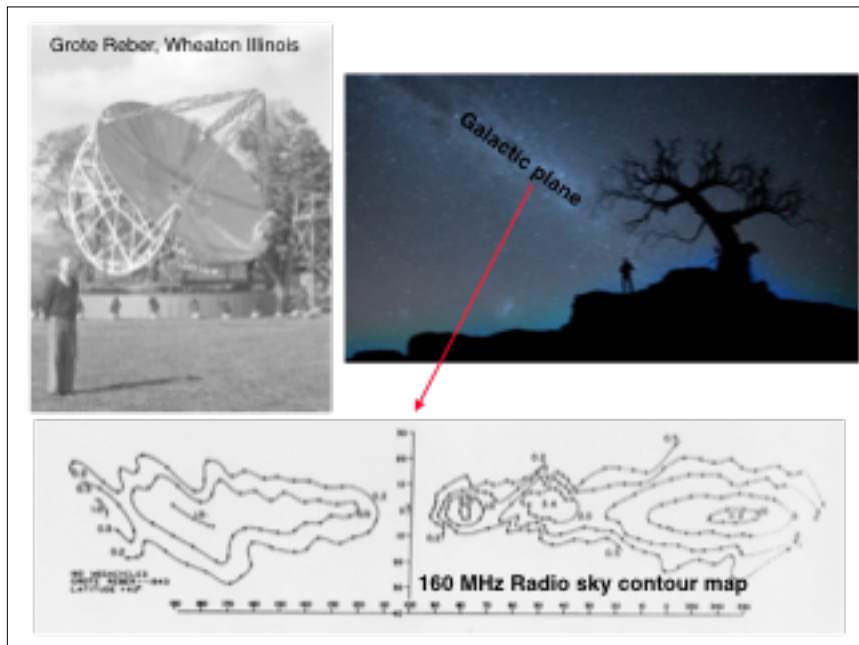
Radio Astronomy

- Bit of history
- Collecting radio waves
 - How it's done
 - Quantifying the waves
- What makes radio waves?
 - Synchrotron emission
 - Bremsstrahlung
 - Source classes

1



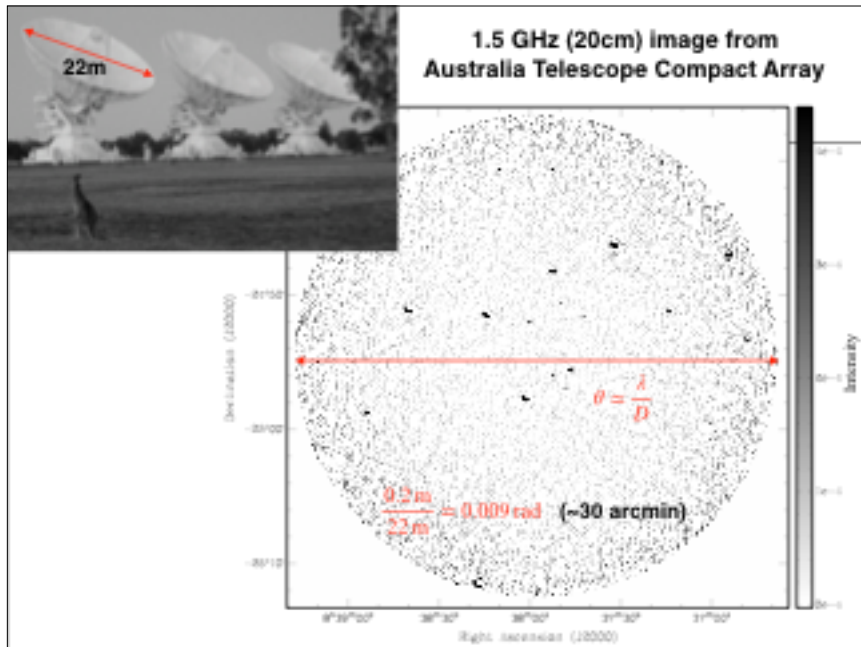
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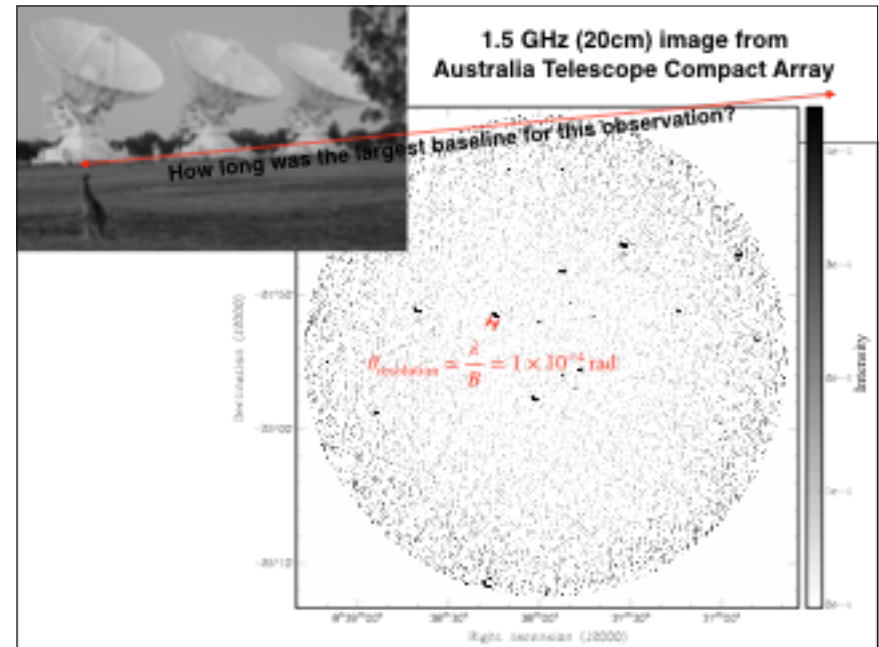
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4

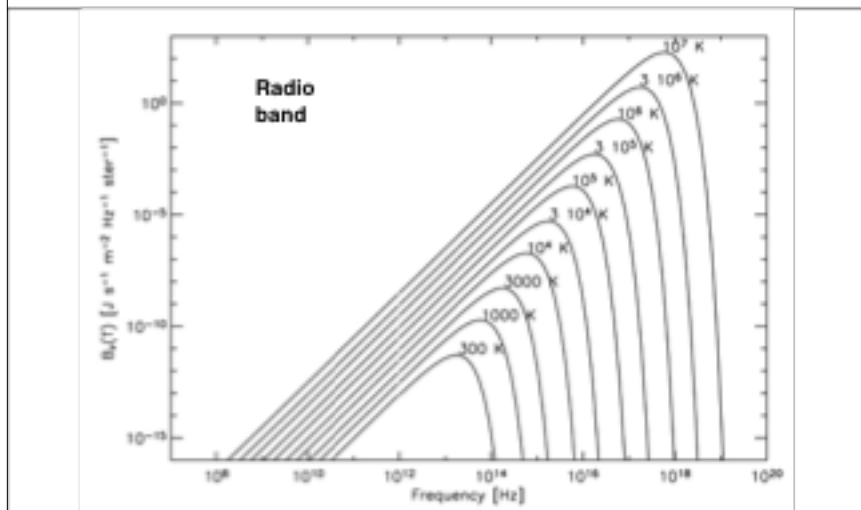


5



6

Black-body spectrum



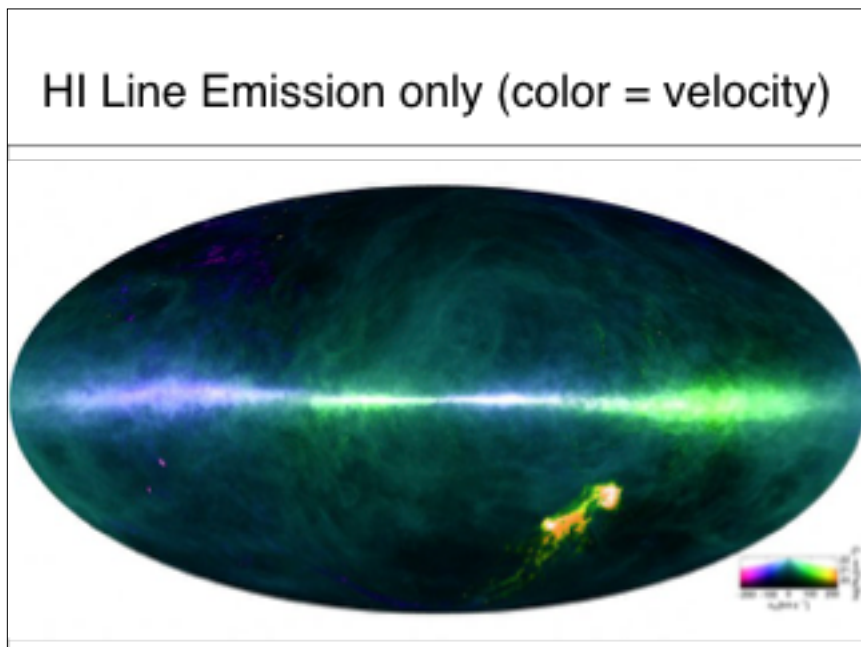
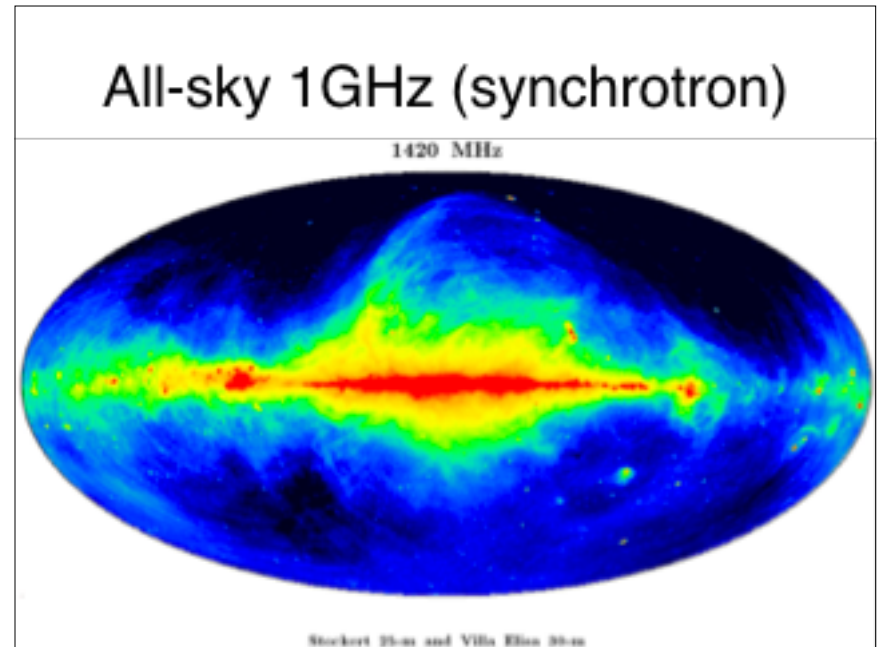
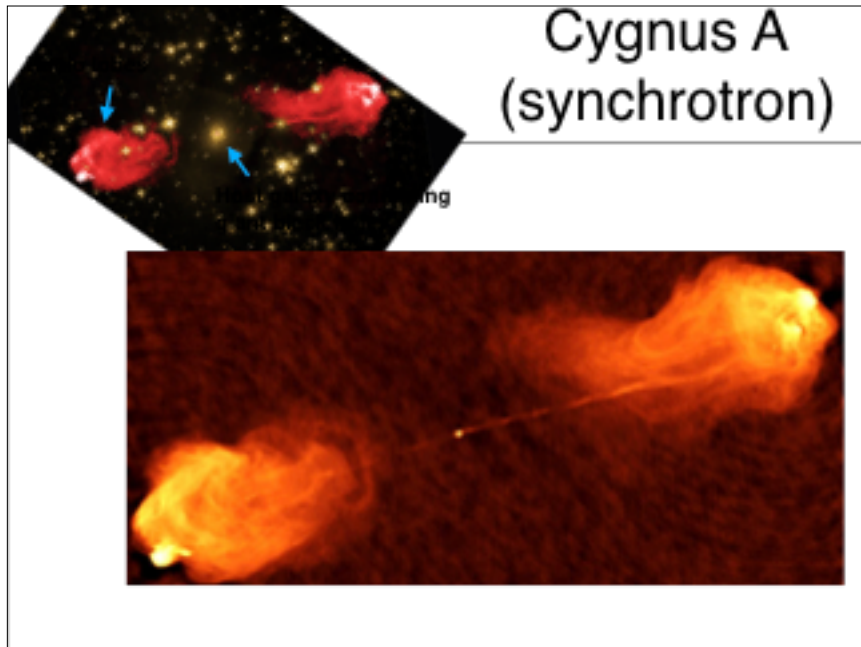
7

Emission Mechanisms Dominating Radio Bands

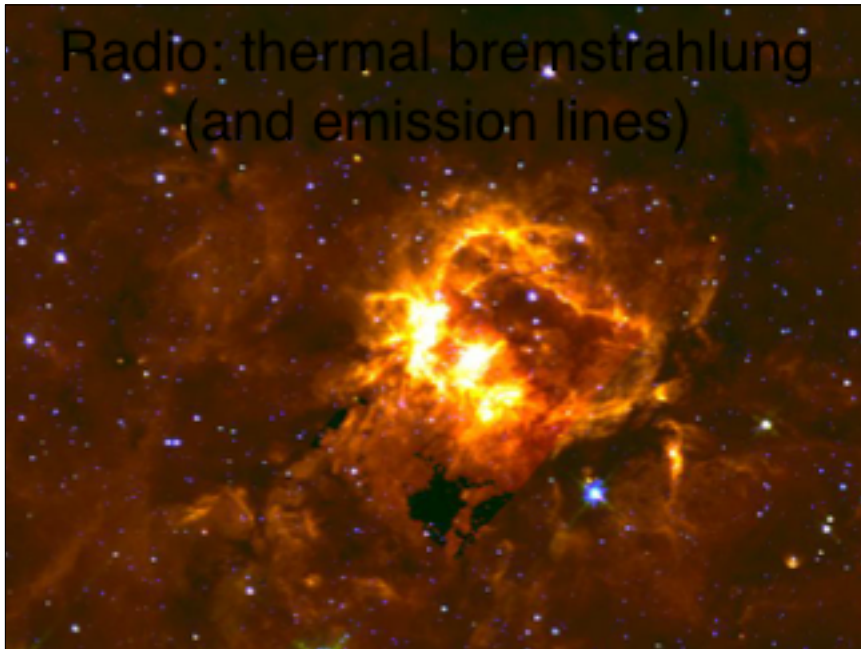
Main idea: ACCELERATED ELECTRONS.

- ♦ Synchrotron
- ♦ Spectral lines
- ♦ Pulsar emission
- ♦ Thermal Bremsstrahlung
- ♦ Blackbody (Planck Spectrum) - not major contributor!

8

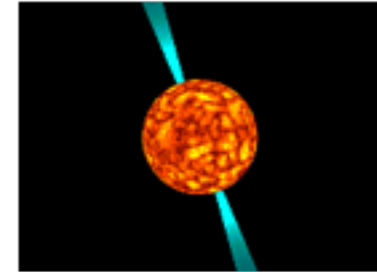
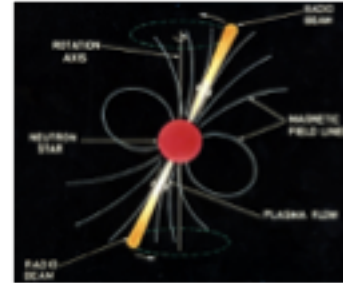


Radio: thermal bremsstrahlung (and emission lines)



13

Pulsars

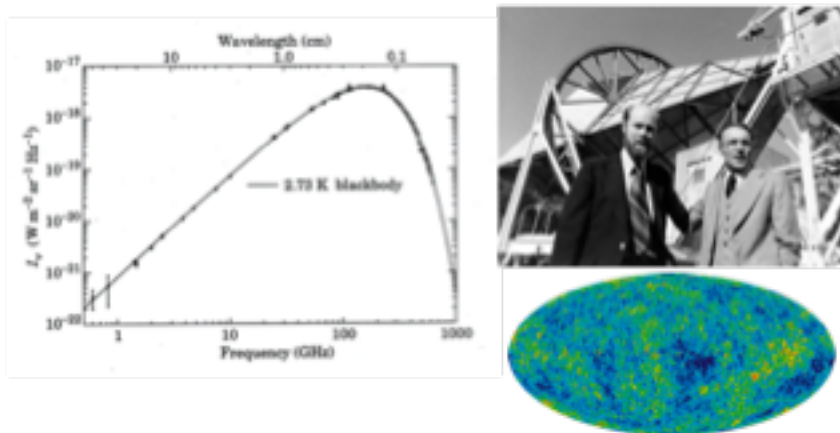


PSR B1937+21:

$P = 1.5578064688197945 \text{ ms}$
 $\pm 0.0000000000000004 \text{ ms}$

14

Thermal (Blackbody)



15