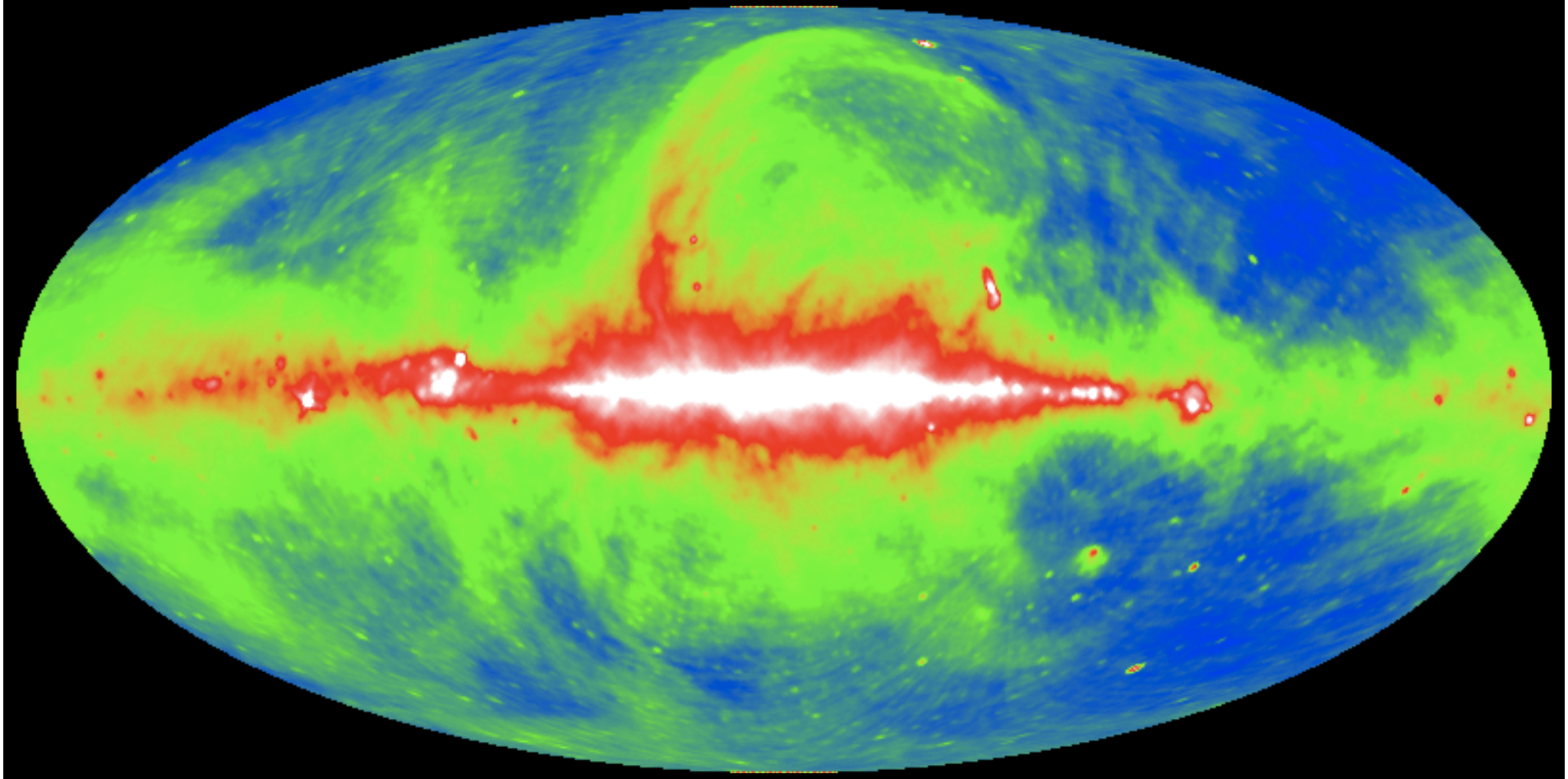
The Multi-Wavelength Galaxy

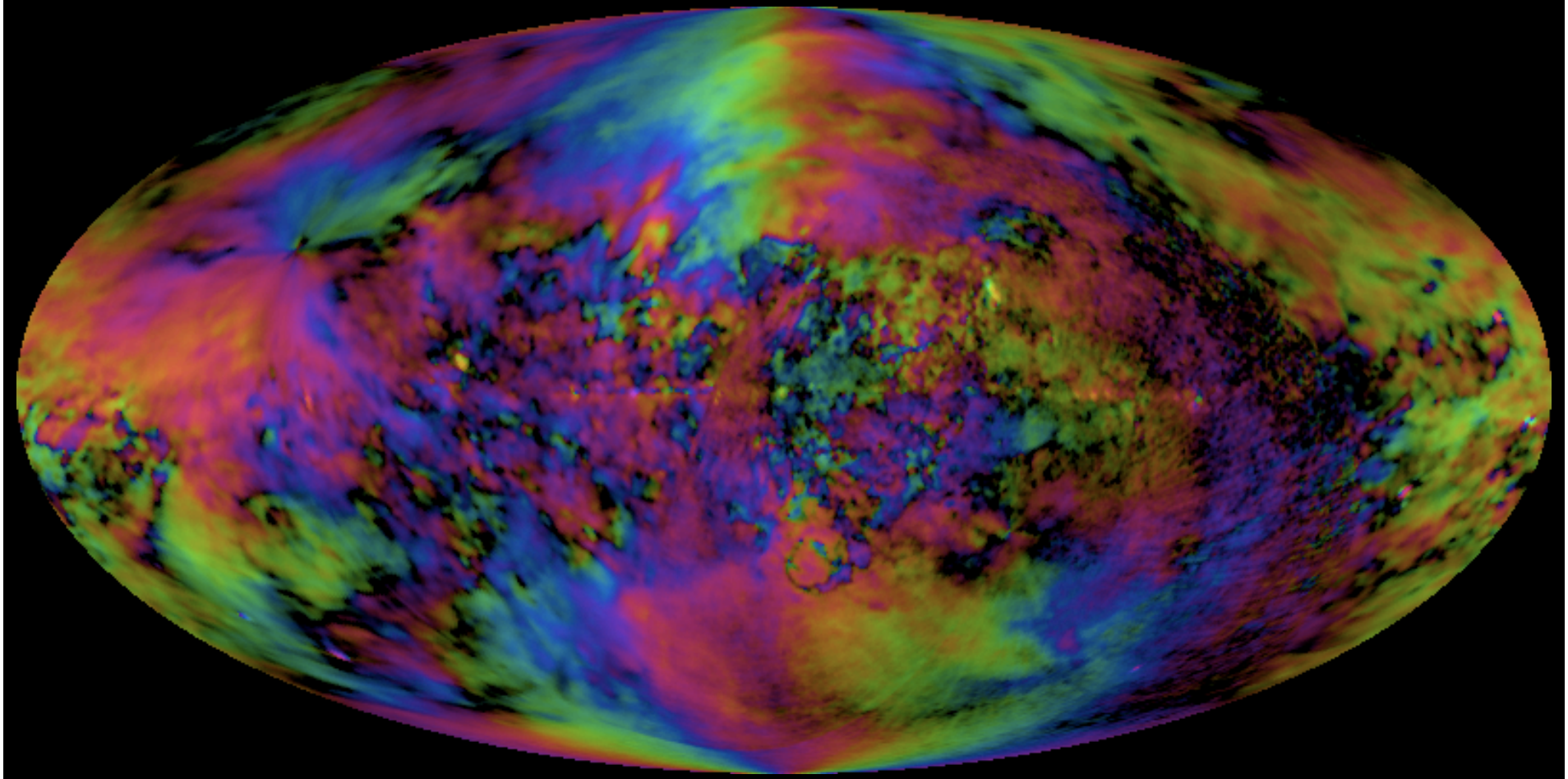
Radio Continuum



408 MHz 74 cm Haslam et al 1982

Log scale, 5—166 K

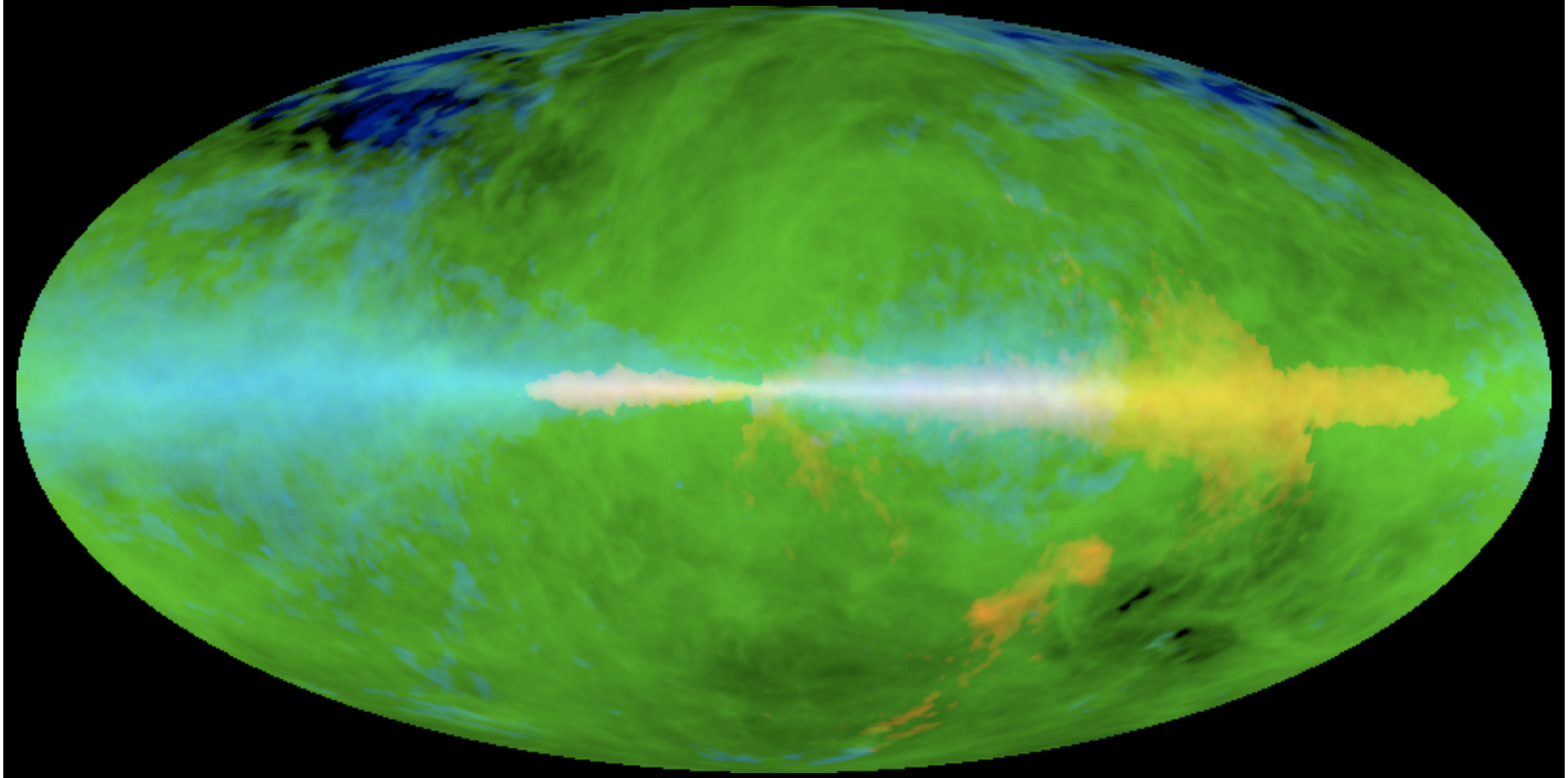
Radio Polarization



1.4 GHz 21 cm Wolleben et al 2006; Testori et al 2008

Greyscale = polarized intensity, hue = direction (red=N-S; green=NE-SW; blue=NW-SE)

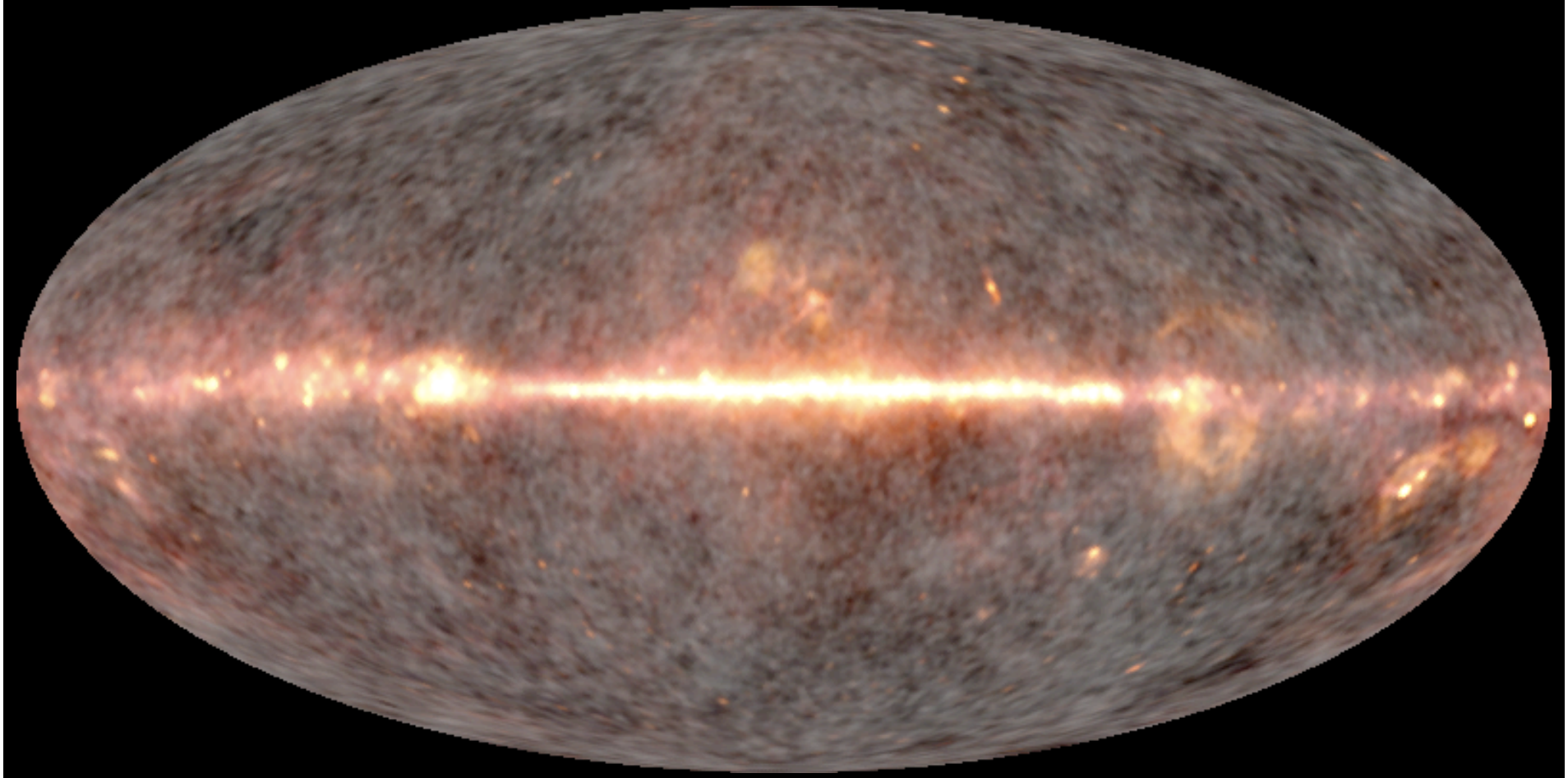
Radio – Neutral Hydrogen Line



1.4 GHz 21 cm Kalberla et al 2009

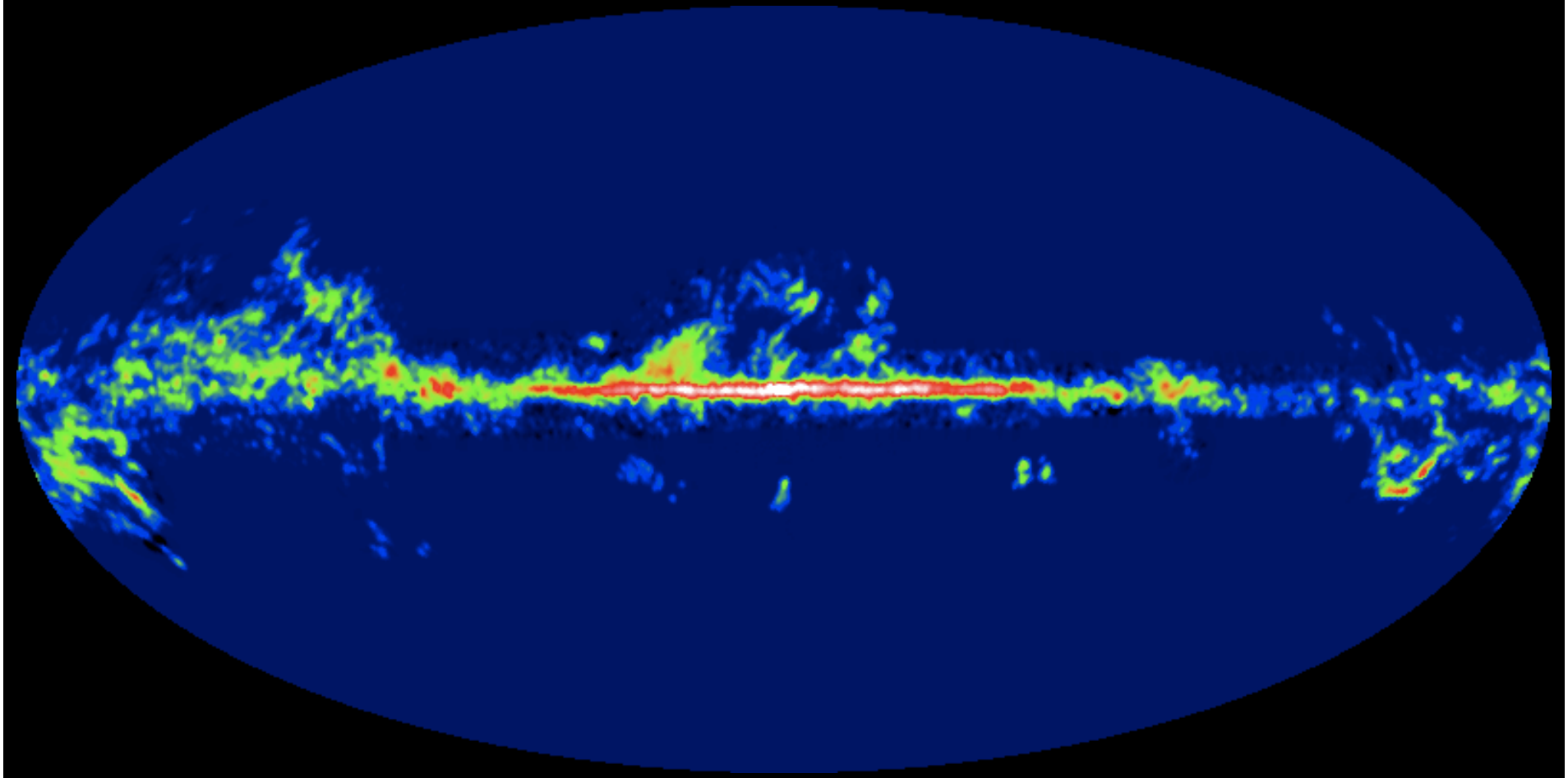
Green: |v|<30km/s; red, blue |v|<450km/s. Log scale, 1—10^4 K km/s

Microwave Continuum



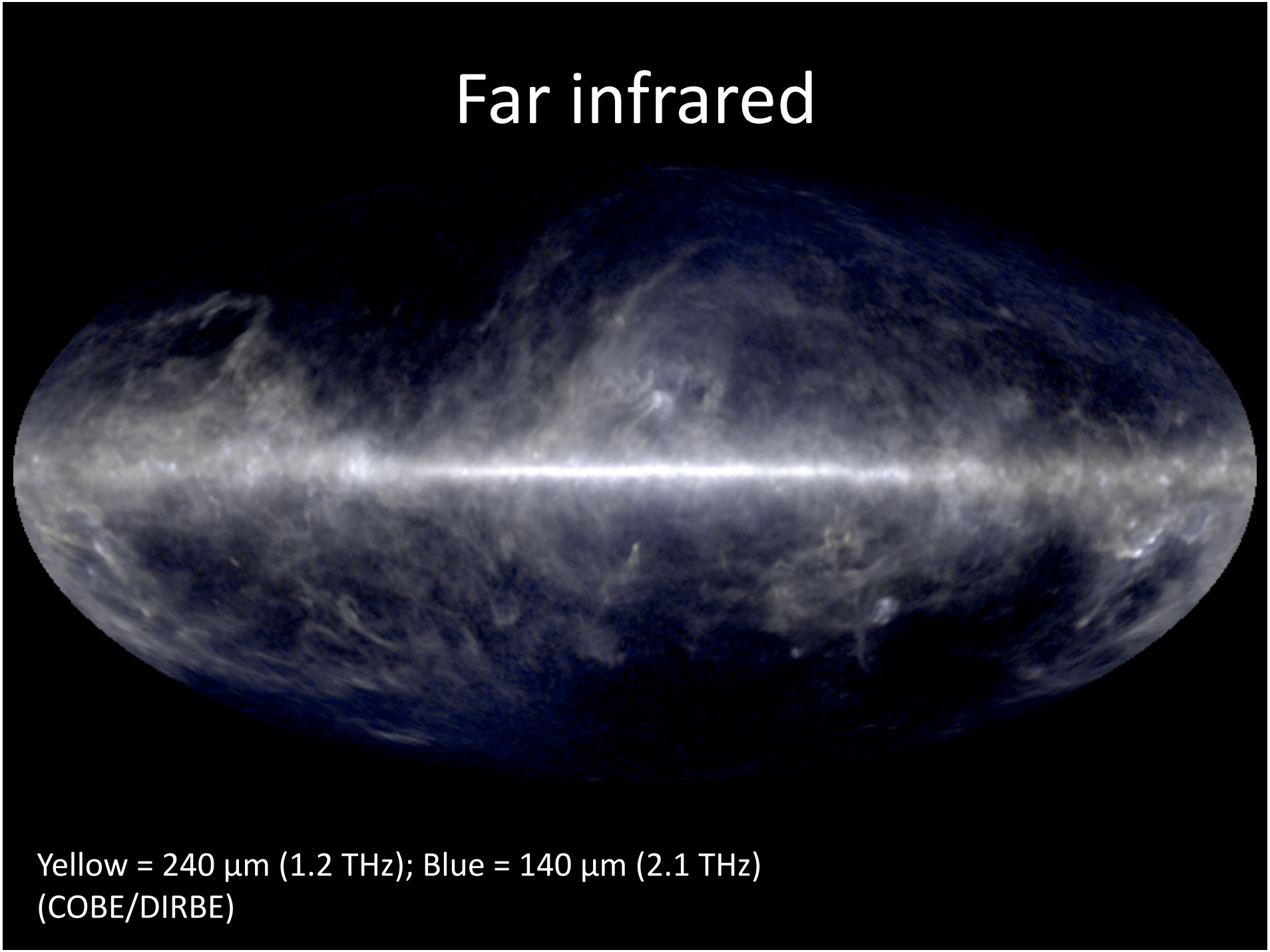
Red = 22 GHz (1.4cm); Green = 41 GHz (7 mm); Blue = 94 GHz (3 mm)
WMAP

Microwave – CO Line



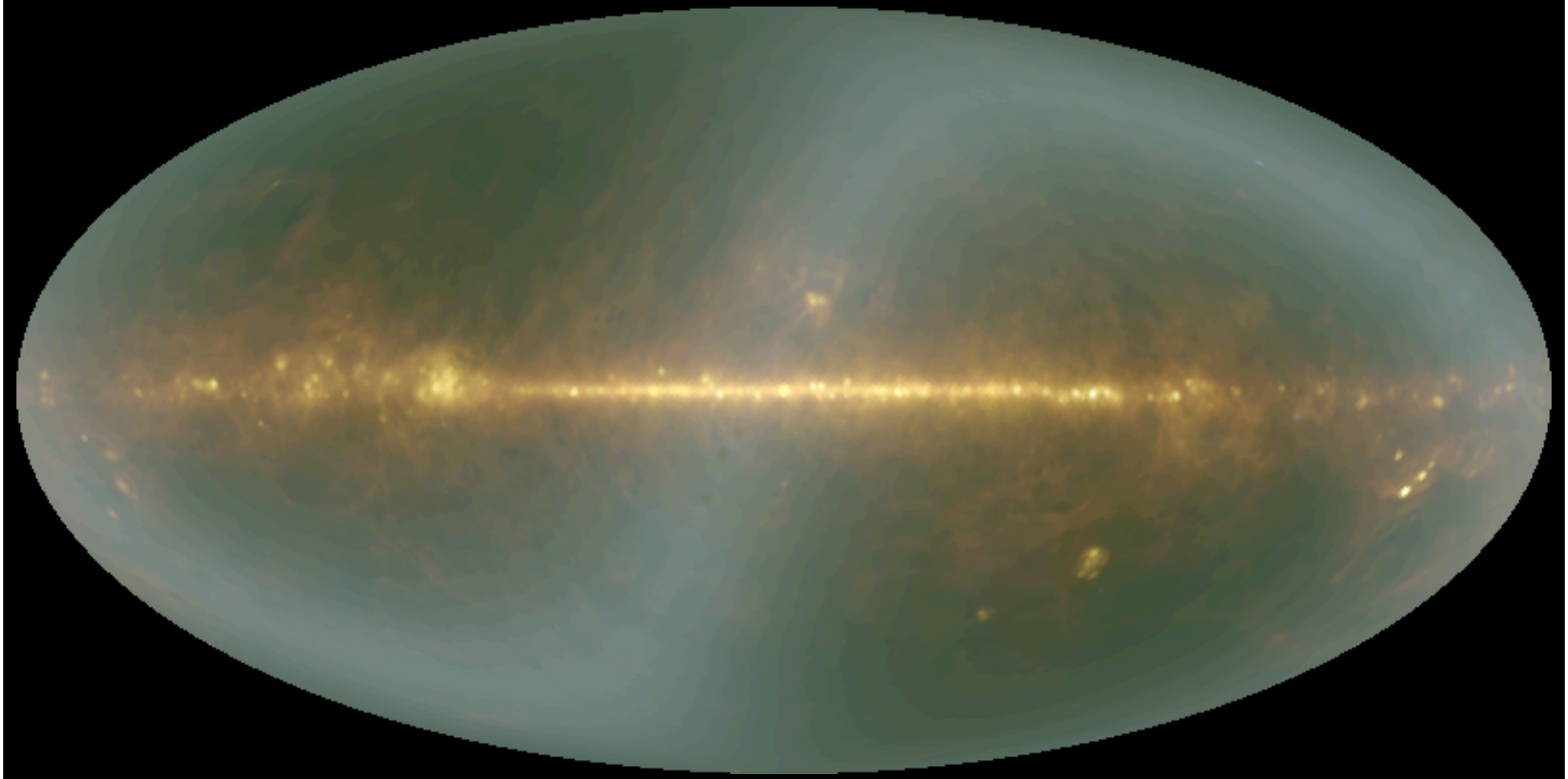
CO J=1➔0 115 GHz 2.6 mm Dame et al 2001

Far infrared



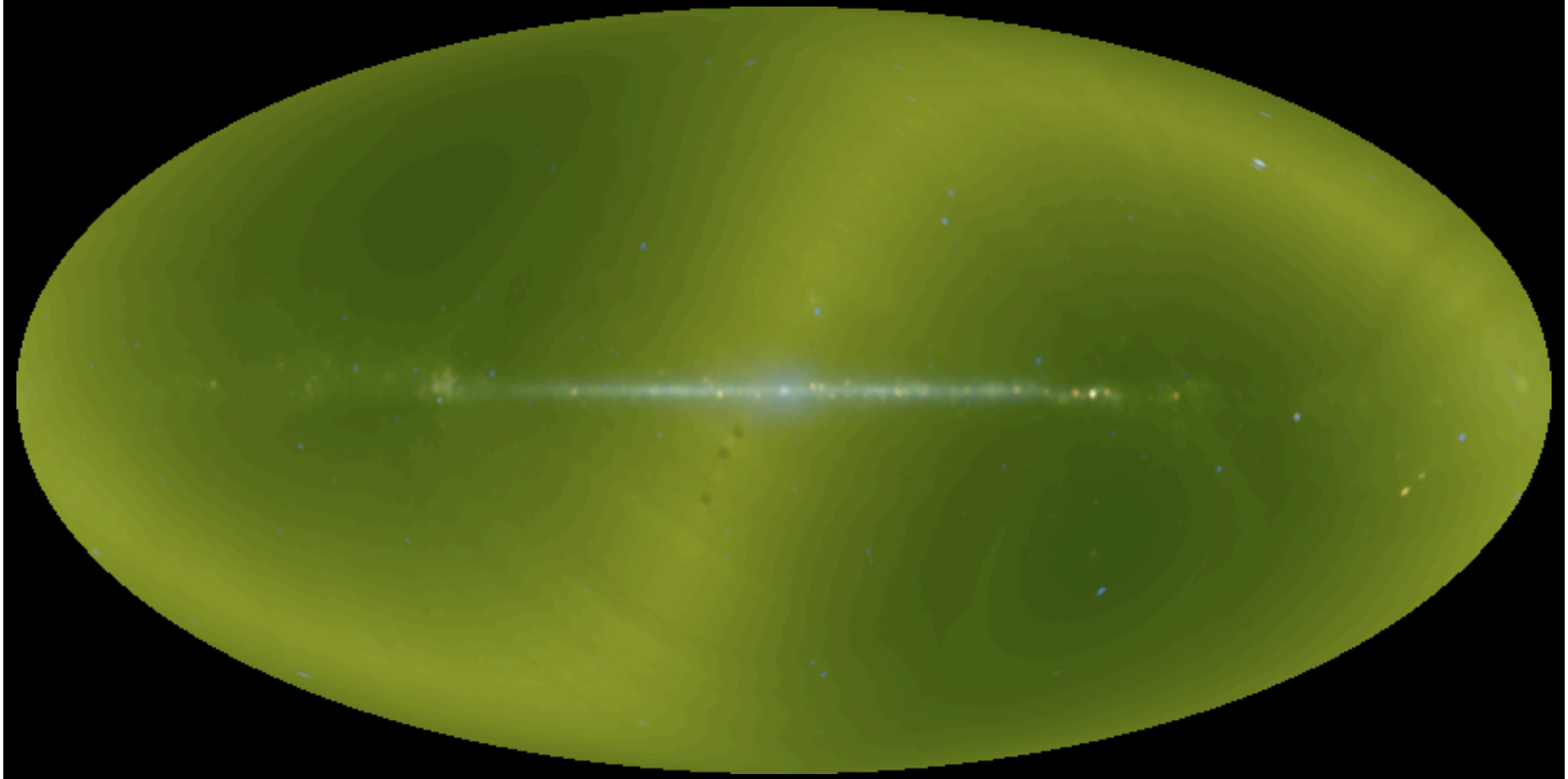
Yellow = 240 µm (1.2 THz); Blue = 140 µm (2.1 THz)
(COBE/DIRBE)

Far/mid infrared



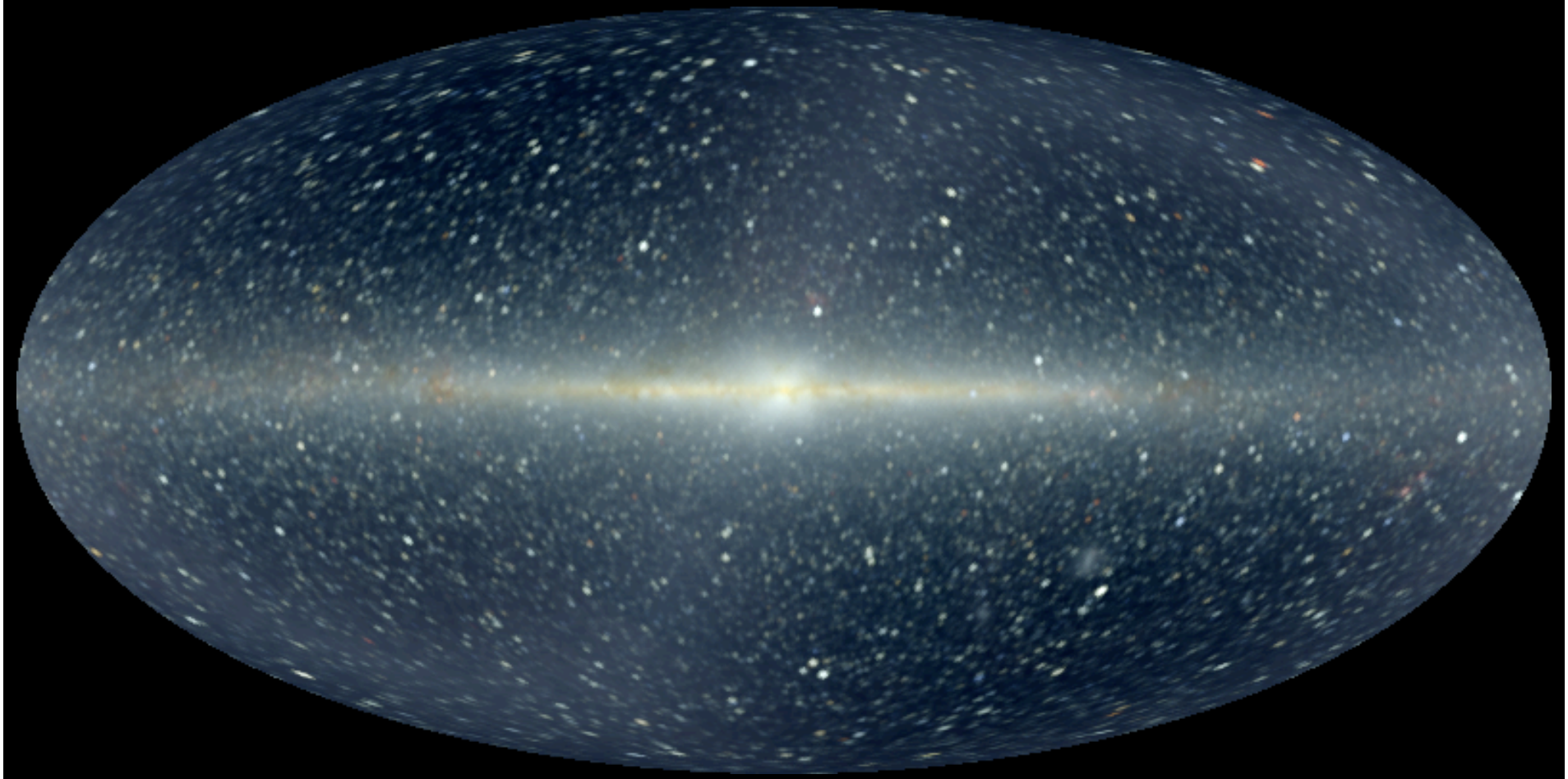
Red = 100 µm; Green = 60 µm; Blue = 25 µm
(COBE/DIRBE)

Mid-infrared



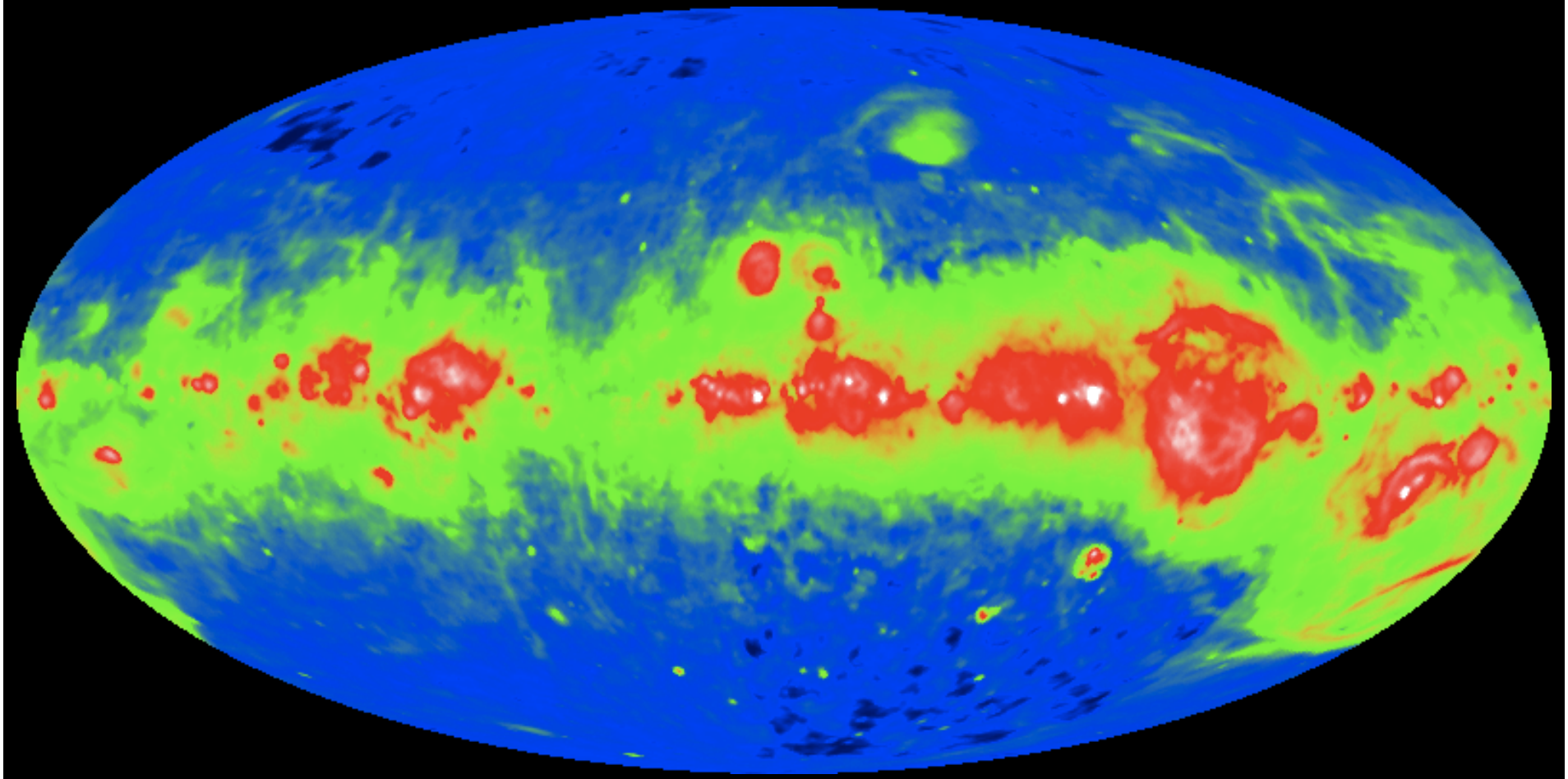
Red = 25 µm; Green = 12 µm; Blue = 5 µm
(COBE/DIRBE)

Near infrared



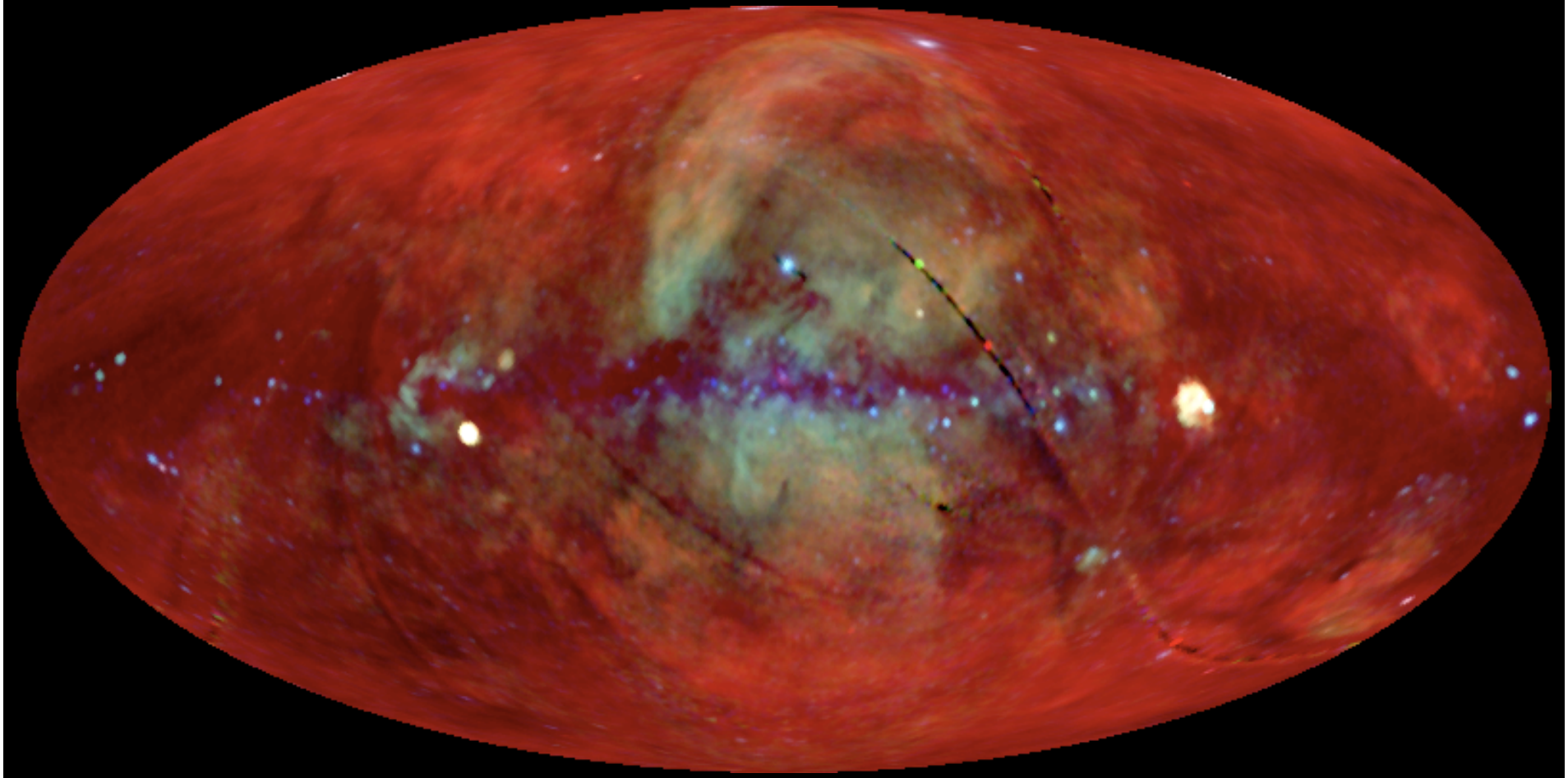
Red = 3.5 μm; Green = 2.2 μm; Blue = 1.25 μm
(COBE/DIRBE)

Diffuse Hα (visible)



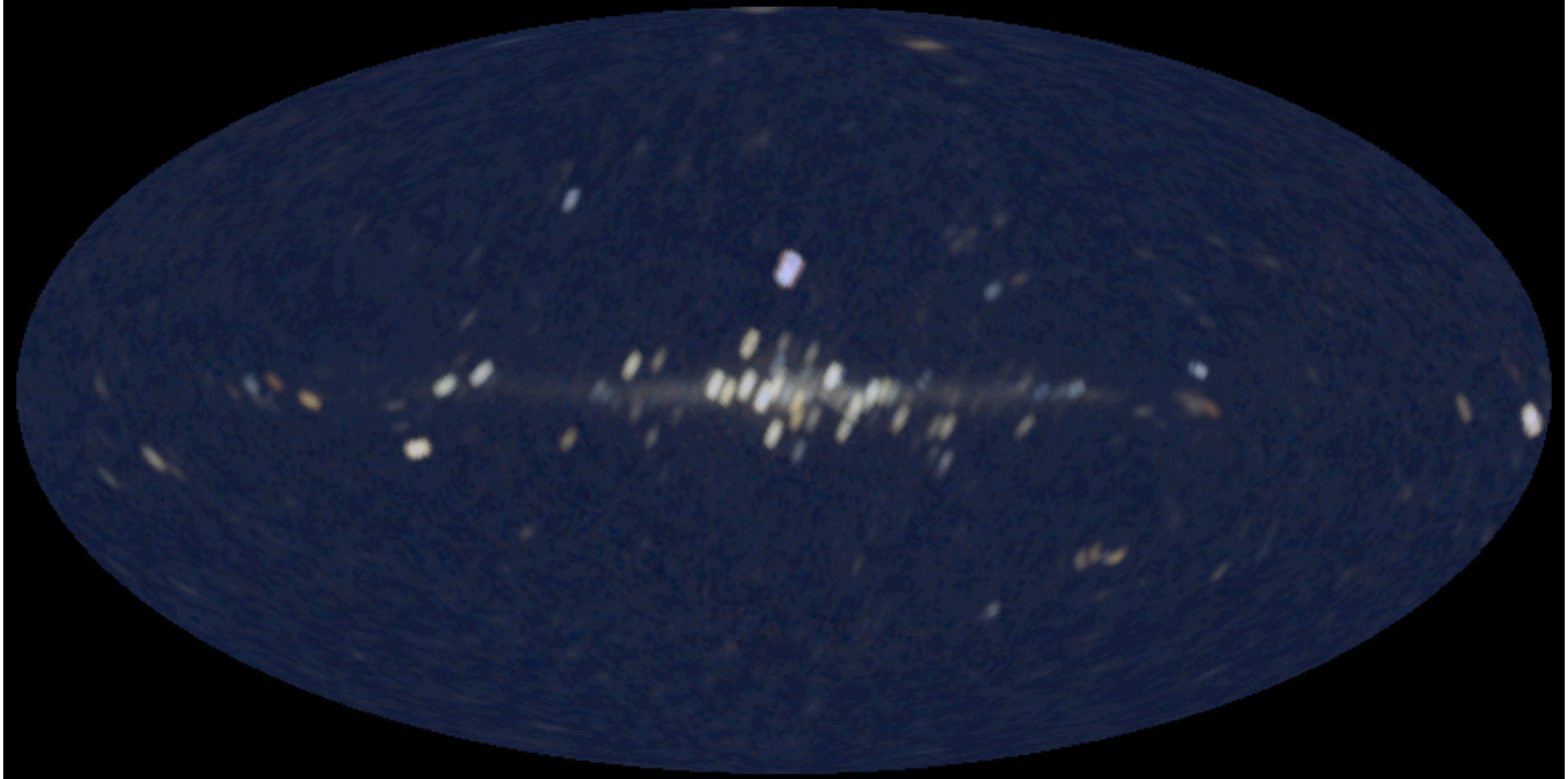
6563 Å H n=3→2
Compilation by Finkbeiner 2003

Soft X-rays



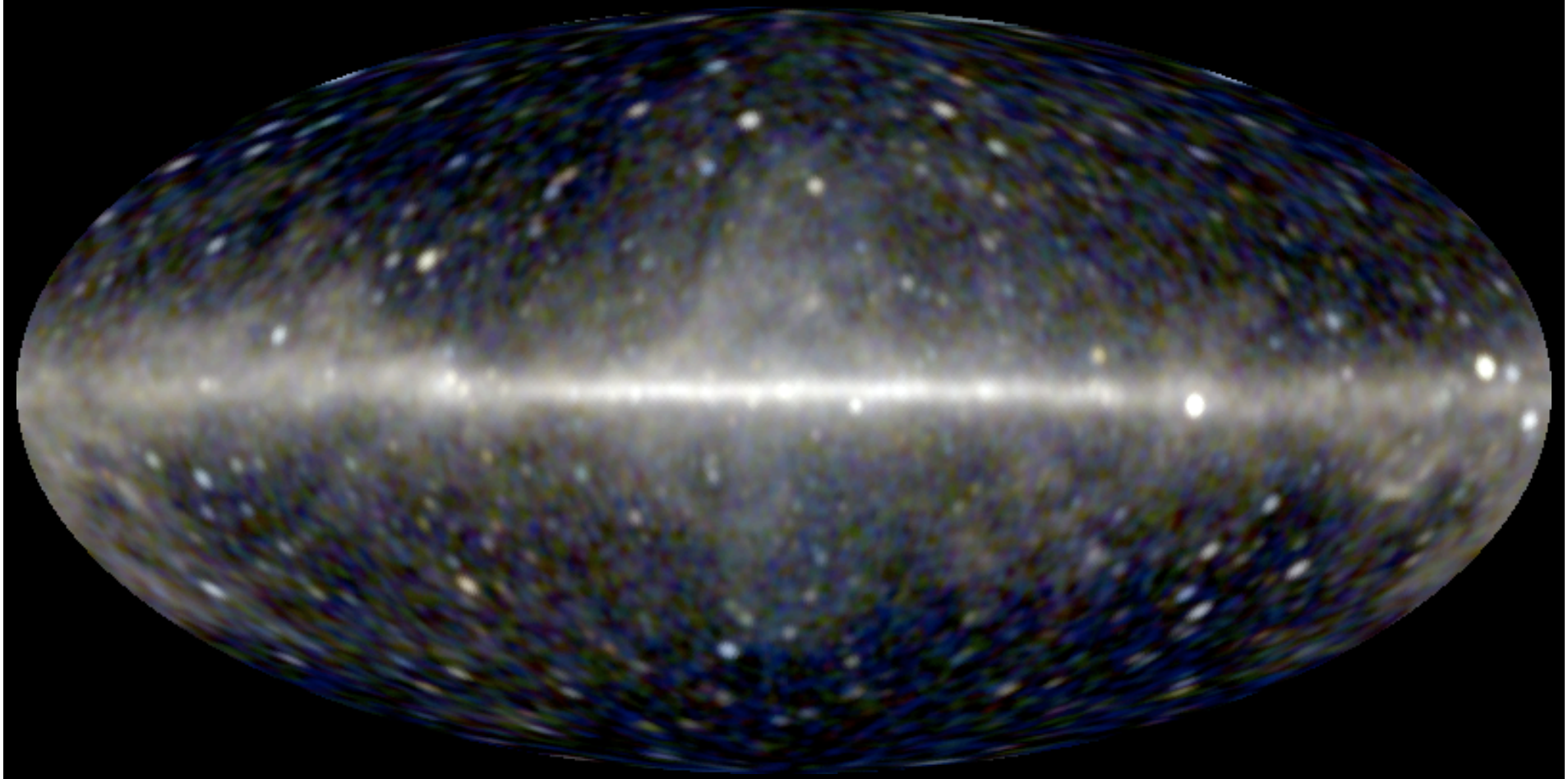
Red = 0.3 keV; Green = 0.8 keV; Blue = 1.5 keV
ROSAT (Freyberg et al 1999)

Hard X-rays



Red = 2.5 keV; Green = 4 keV; Blue = 8 keV (Actual bands broad)
HEAO (Allen et al 1994)

Gamma rays



Red = 1—2 GeV Green = 2—5 GeV Blue = 5—10 GeV
Fermi/LAT (version processed by Dobler et al 2009)