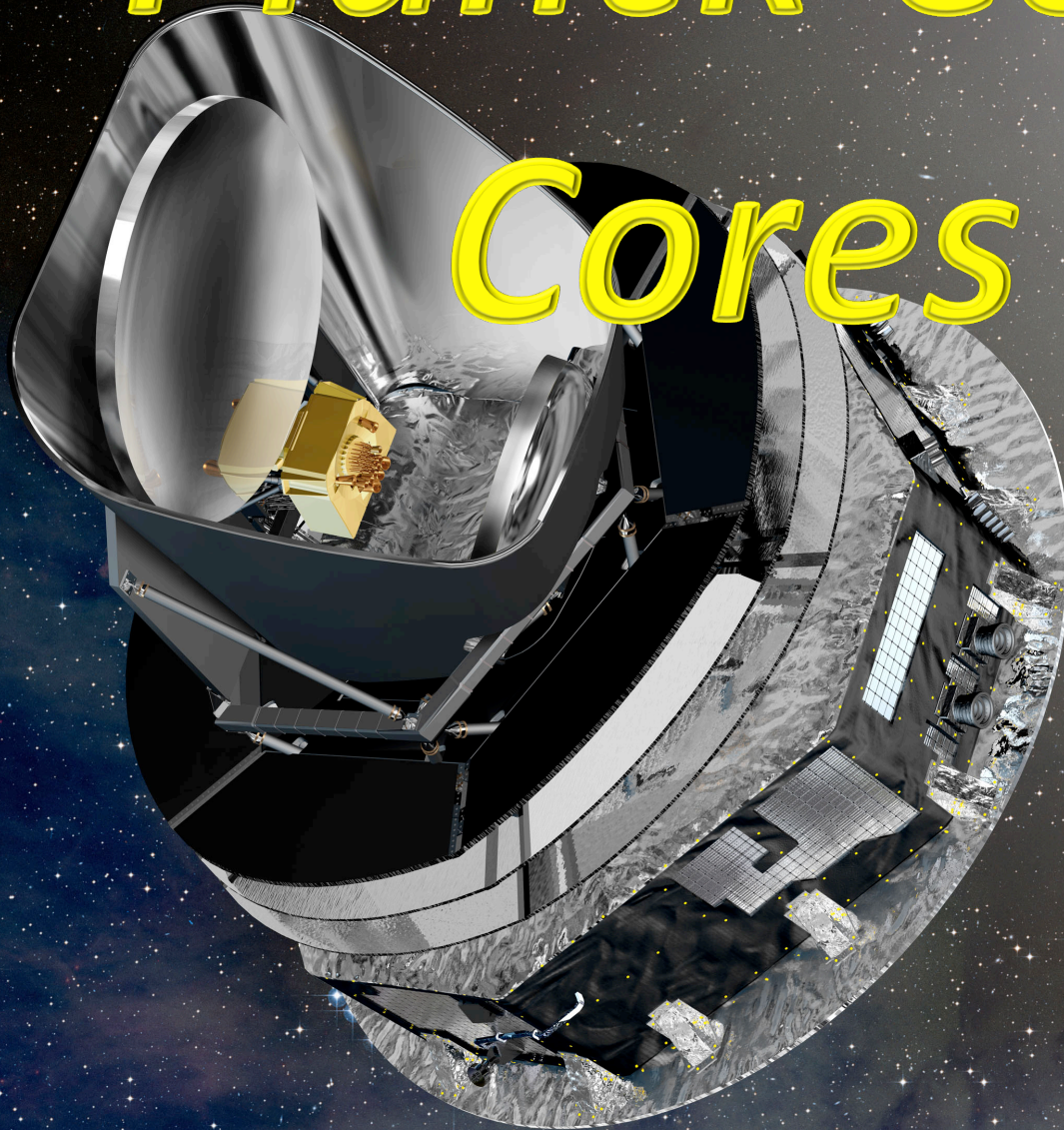


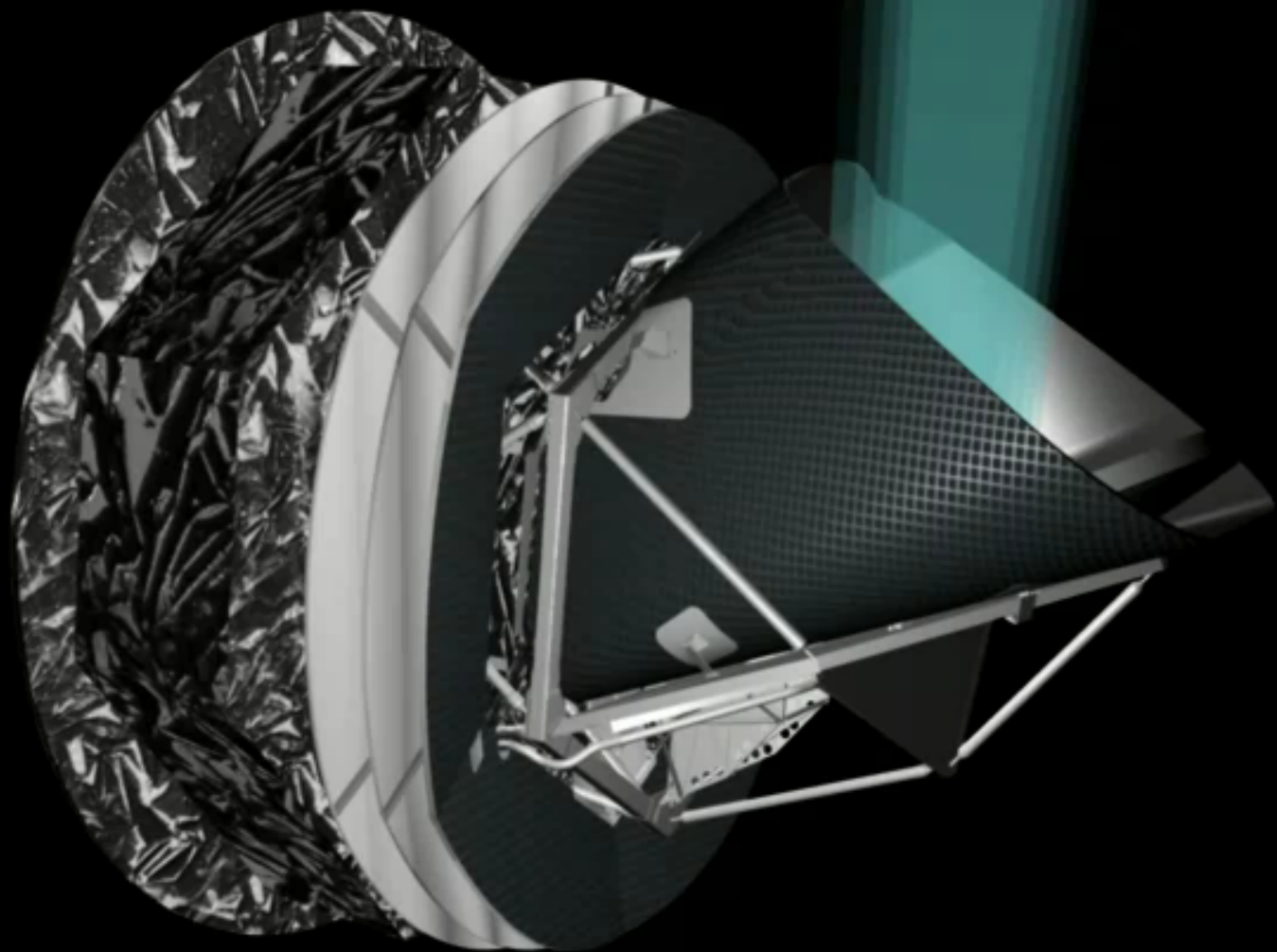
Planck Cold

Cores

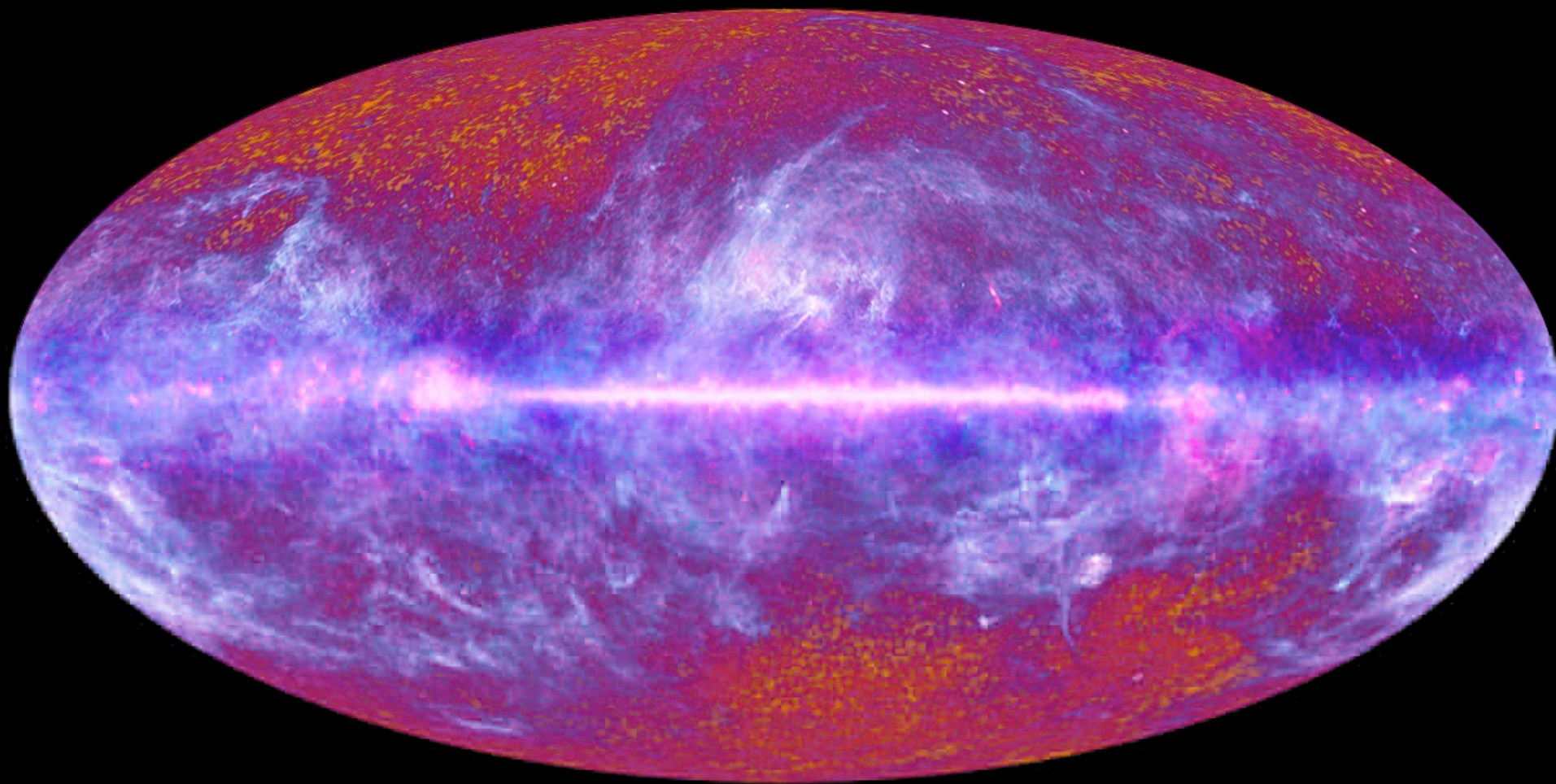


Planck Telescope

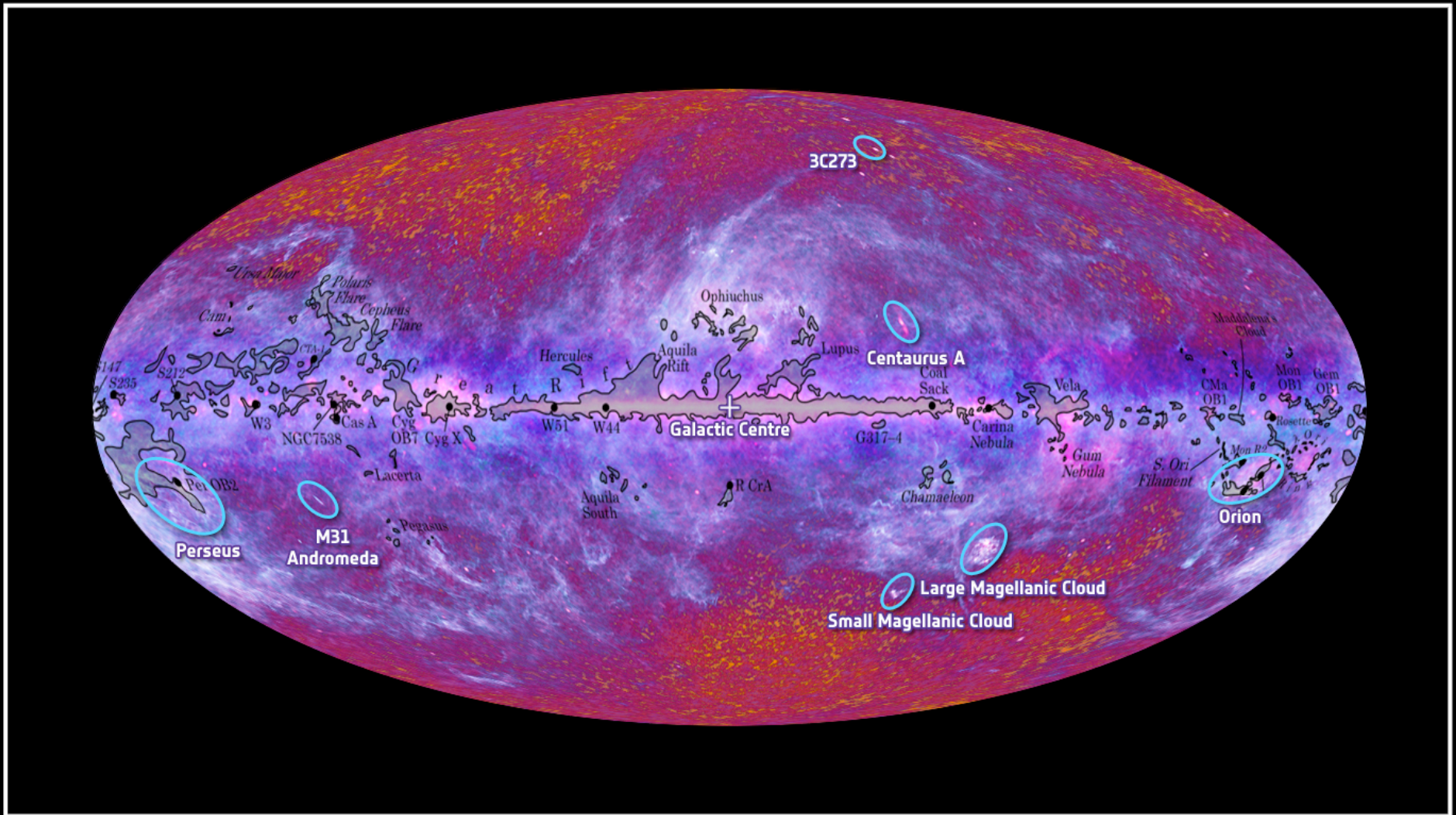
- Planck is a ESA mission to map the Cosmic Microwave Background
- 1.9 x 1.5 primary mirror
- 9 bands covering 30 GHz to 867 GHz
- Launched to L2 where it is continuously mapping the sky
- Released first all sky map in Feb 2010
- “Foreground” emission is our Galaxy = a census of dense star forming regions including many at high galactic latitudes!



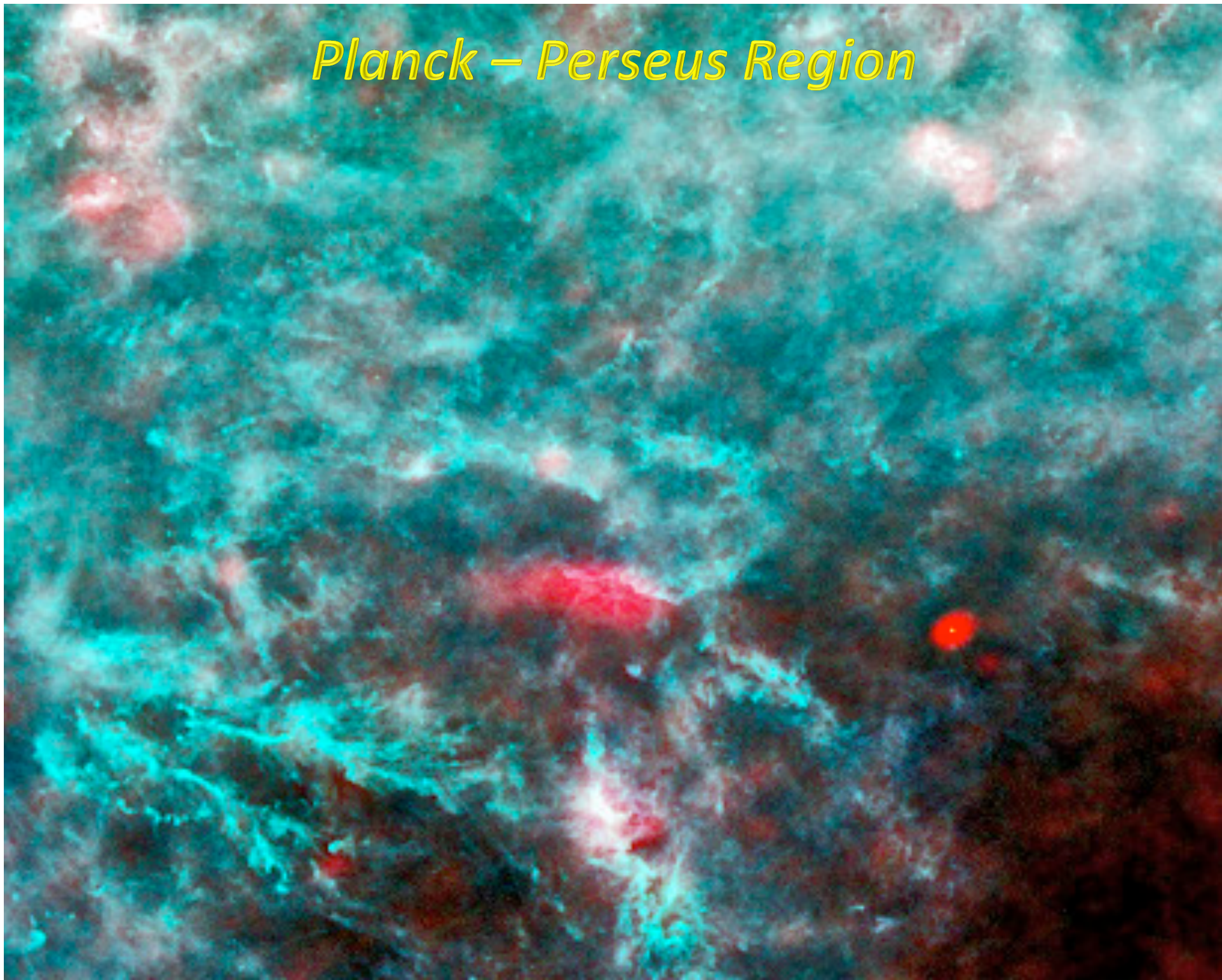
Planck First All Sky Map



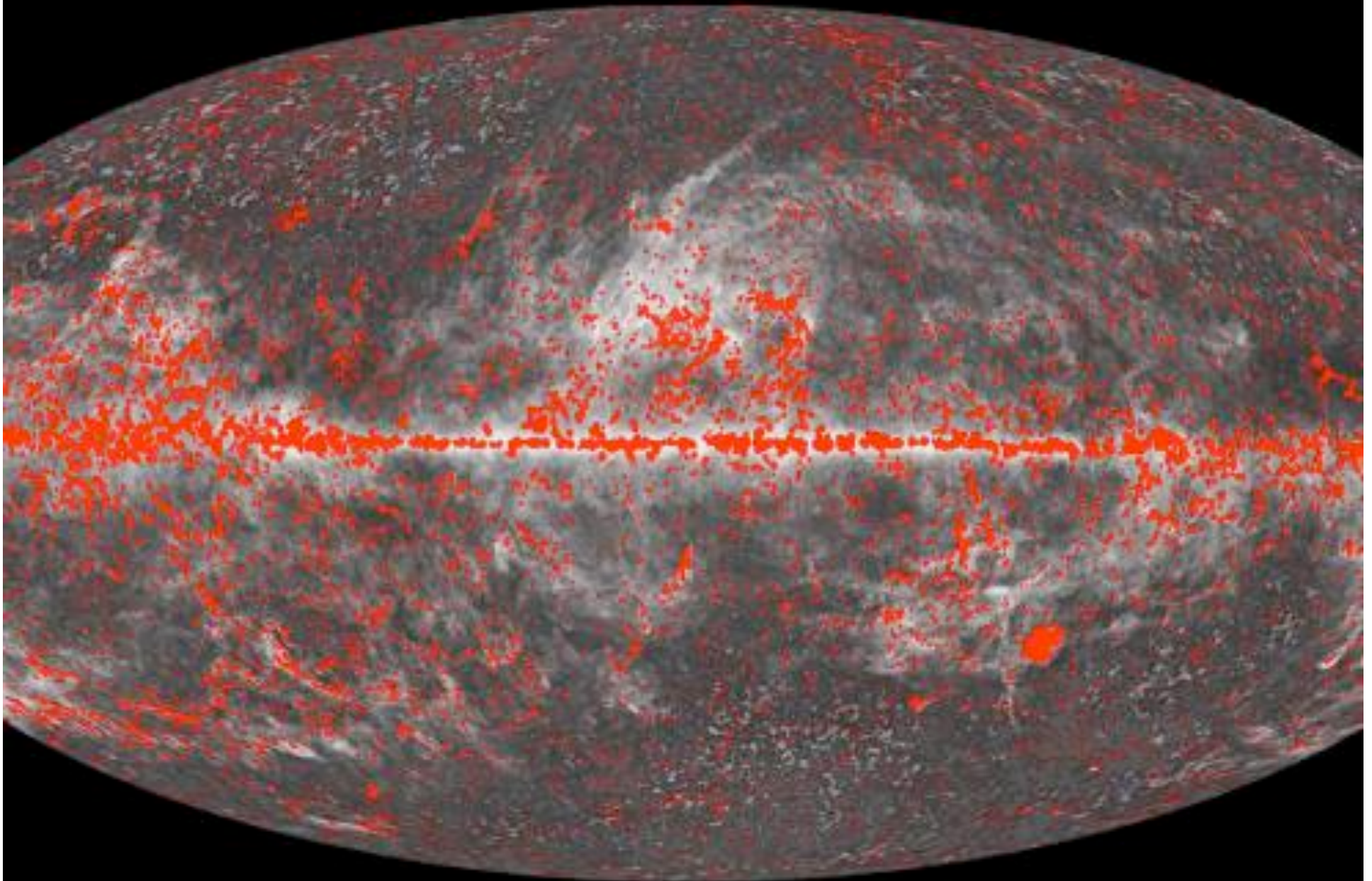
Planck First All Sky Map



Planck – Perseus Region

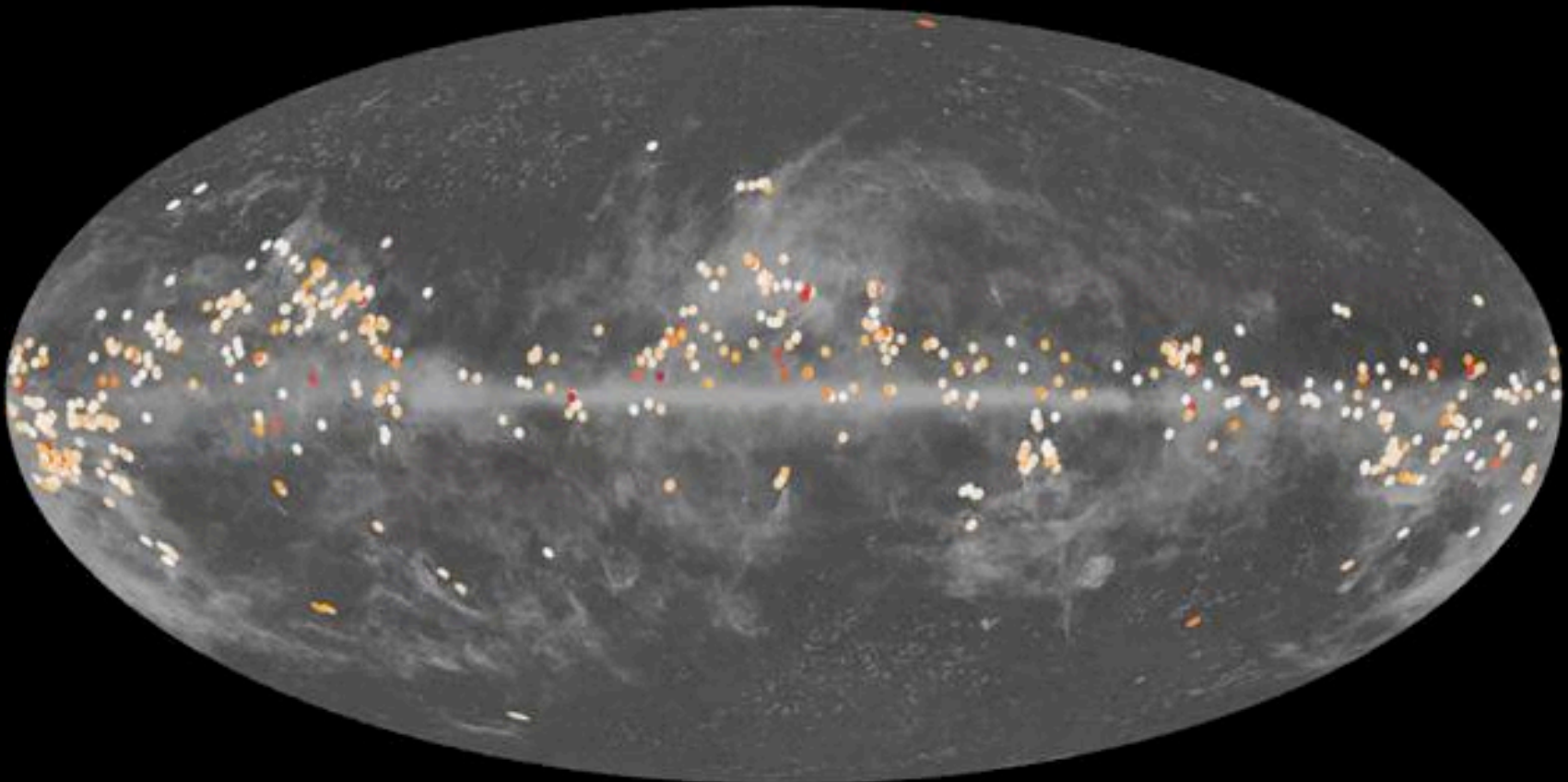


Over 10,000 Planck Objects Detected

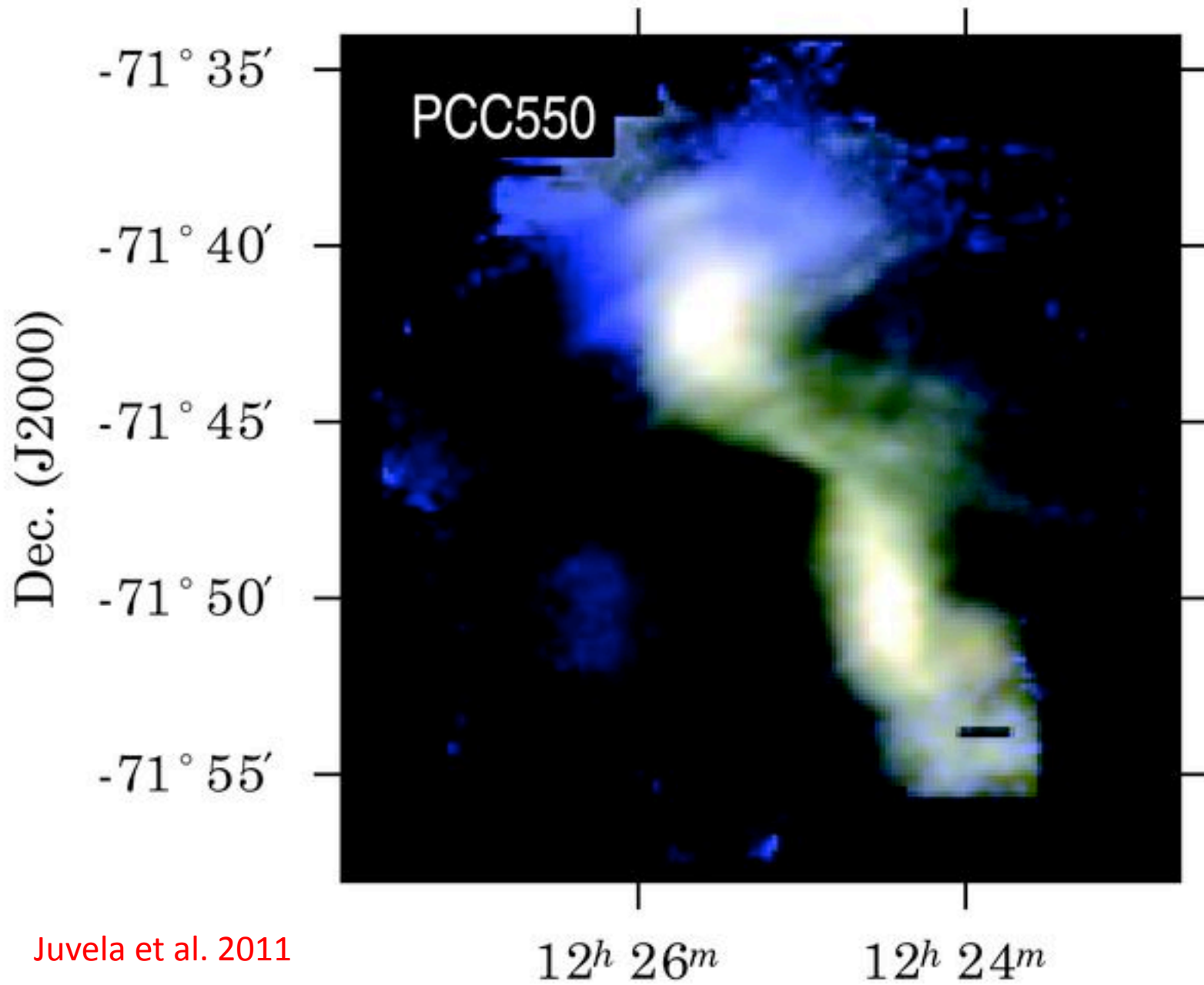


Planck Early Cold Core Catalog

- Early Cold Core Catalog contains 915 entries with many very cold dense cores ($T < 10\text{K}$)!
 - Planck ECC resolution is 4 arcminutes
- This is a subset of the larger Cold Core Catalog of Planck Objects = C3PO
 - Contains $\sim 10,000$ sources and will be improved with future sky coverage

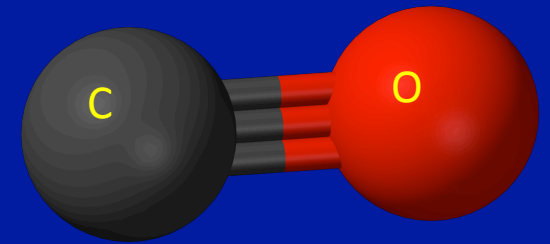
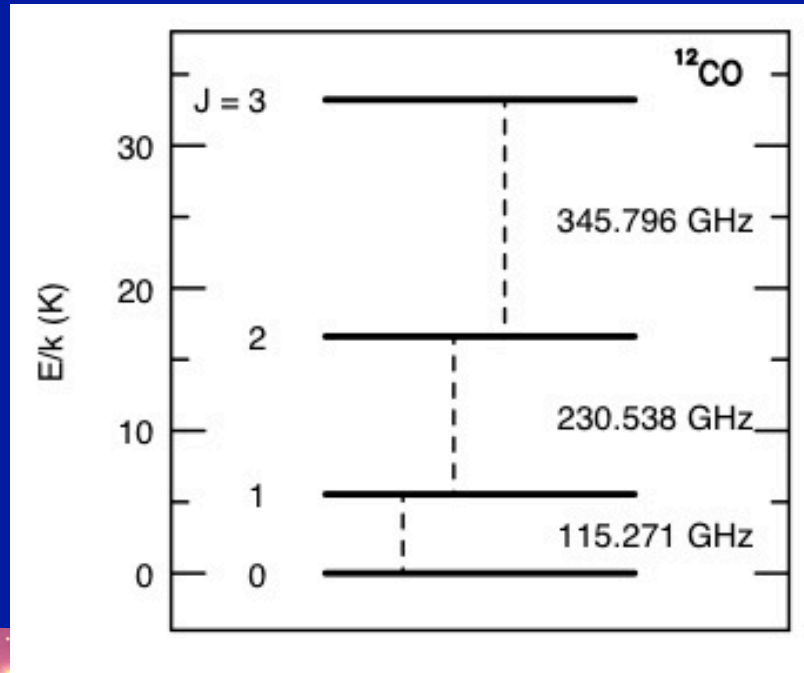


A Herschel Example of a Cold Core



Juvela et al. 2011

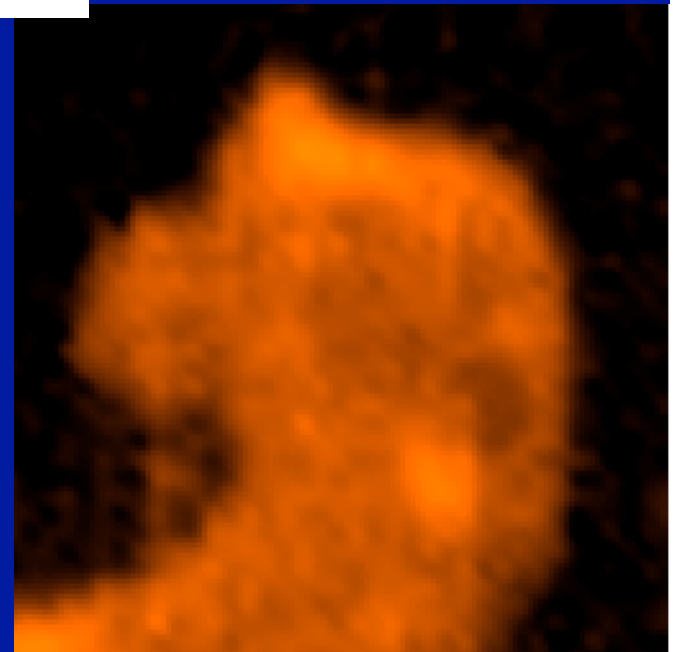
Observing Molecules Toward Cold Cores



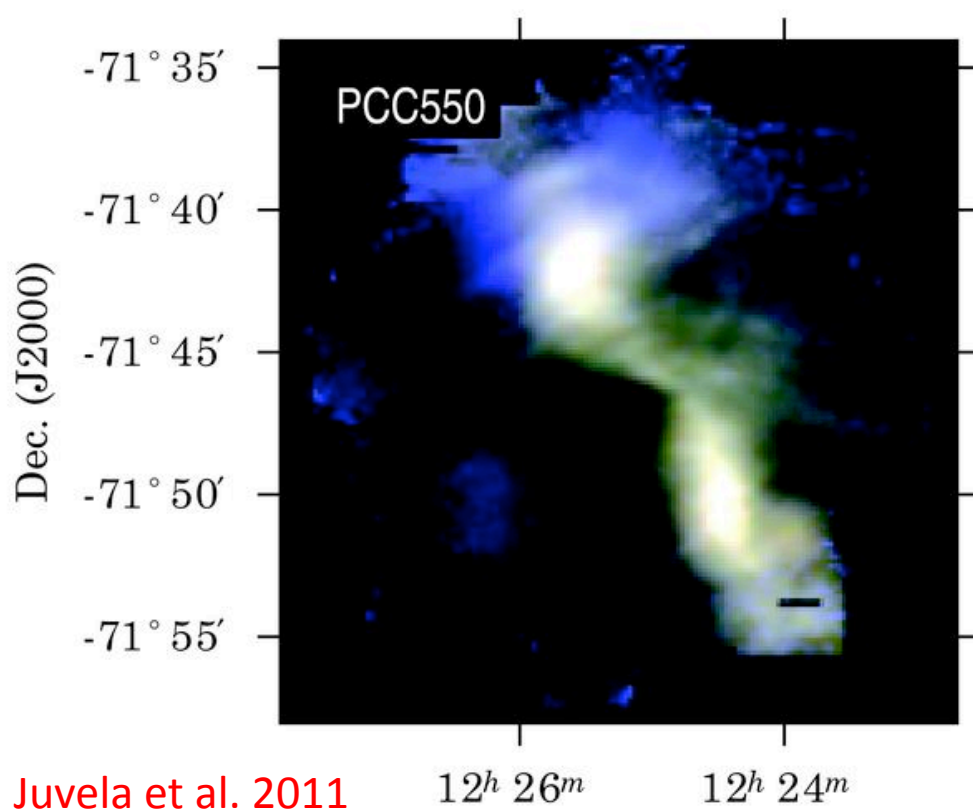
Optical



Radio



A 12m Astro Club Mapping Project ?



Juvela et al. 2011

$12^h 26^m$

$12^h 24^m$

- Map Planck ECC objects with the 12m telescope on Kitt Peak
- N_2H^+ is a dense gas tracer
- $C^{18}O$ is a “isotopologue” of CO that traces the total column density of molecular gas
- 5' x 5' maps ~1 hour per source

- Collaborate with Planck Cold Core Team!

