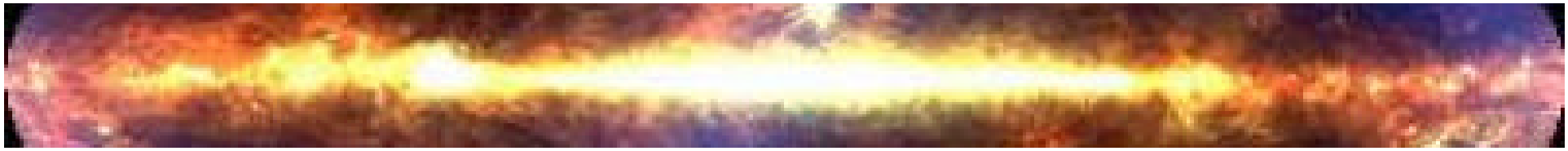
Hi-GAL: the Herschel infrared GALactic Plane Survey

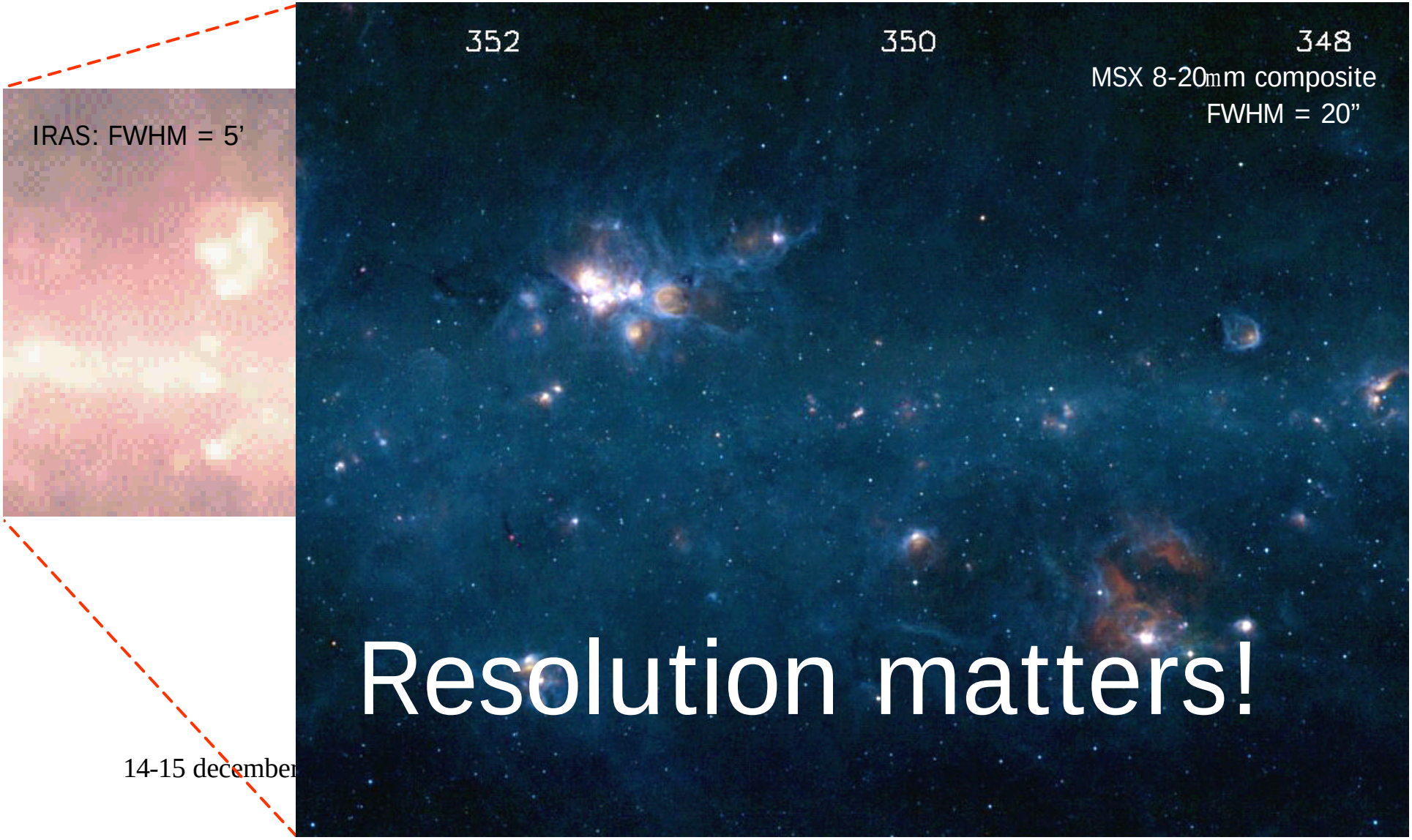


S. Molinari - IFSI/INAF, Rome

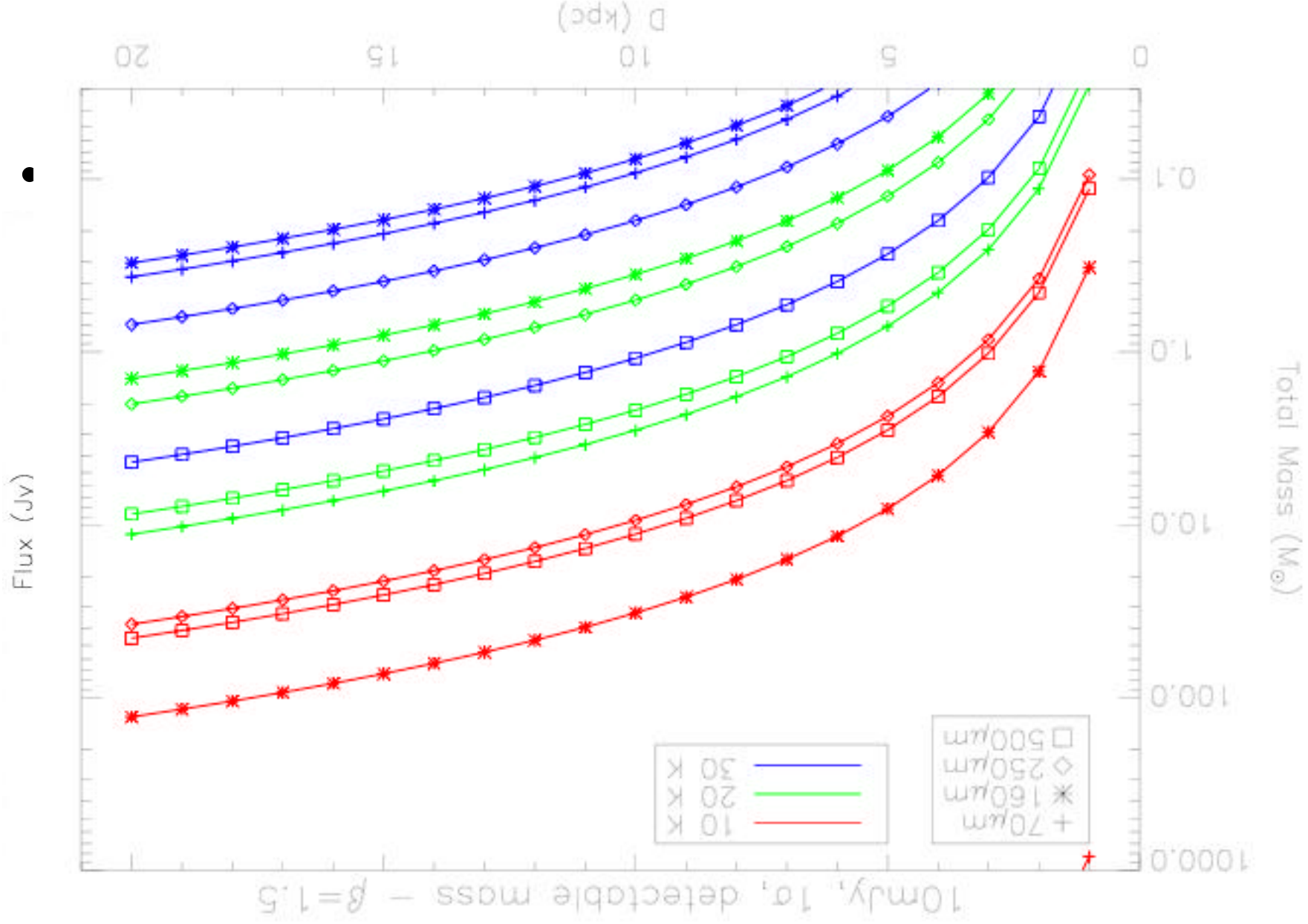
Star Formation on the Global Scale: Resolving the Galactic Engine of the Milky Way

- Measure the star formation rate and history Galaxy-wide
- Obtain the complete inventory of cold dust in the Galactic Plane
- Establishing the existence and nature of star formation thresholds as a function of ISM properties across a full range of galactocentric radii metallicity and environmental conditions
- Determining the relative importance of global *vs* local mechanisms that give rise to star formation.
- Provide templates, recipes and prescriptions for Xgal science

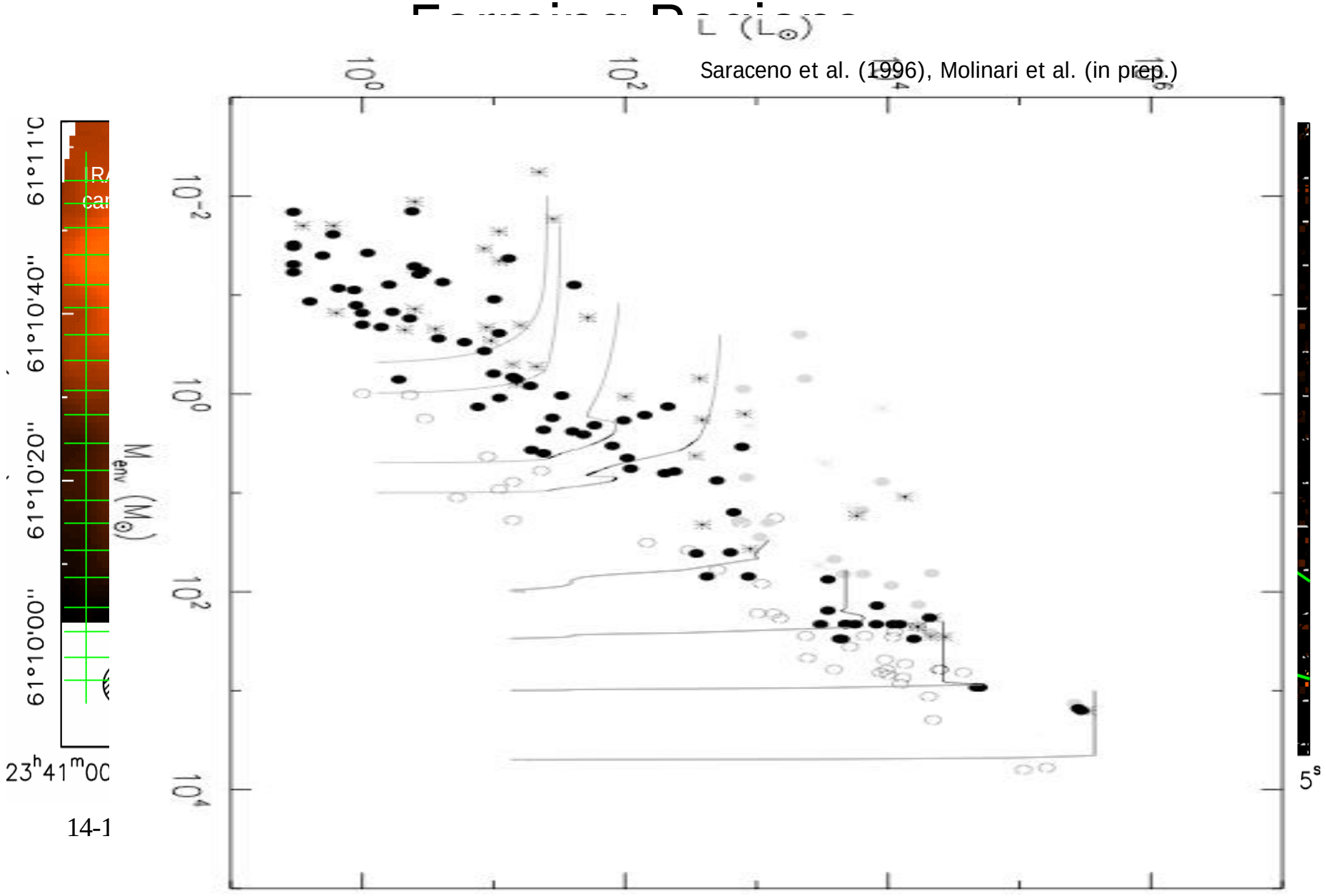
From COBE to Herschel



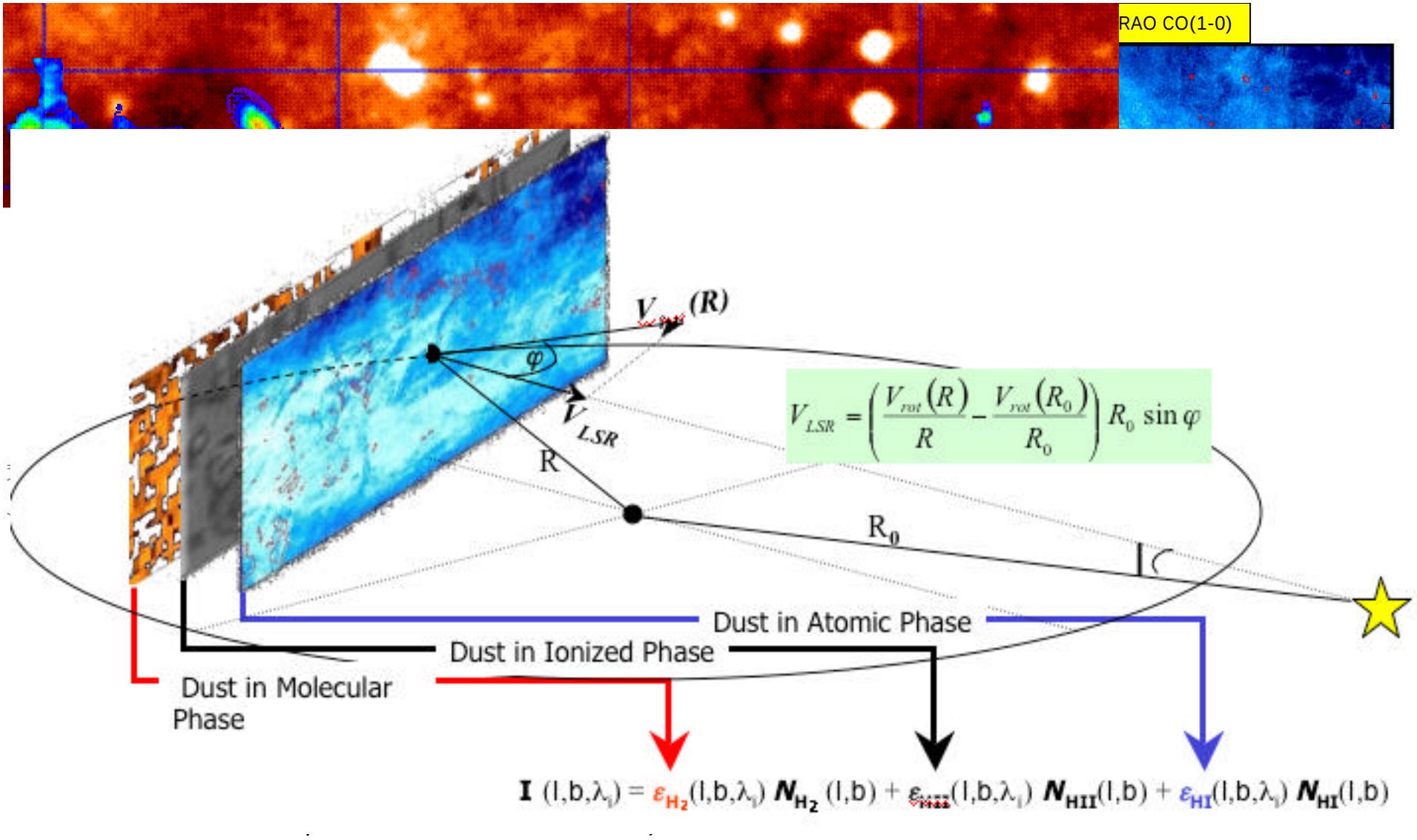
Census of Massive Star Forming regions

- 

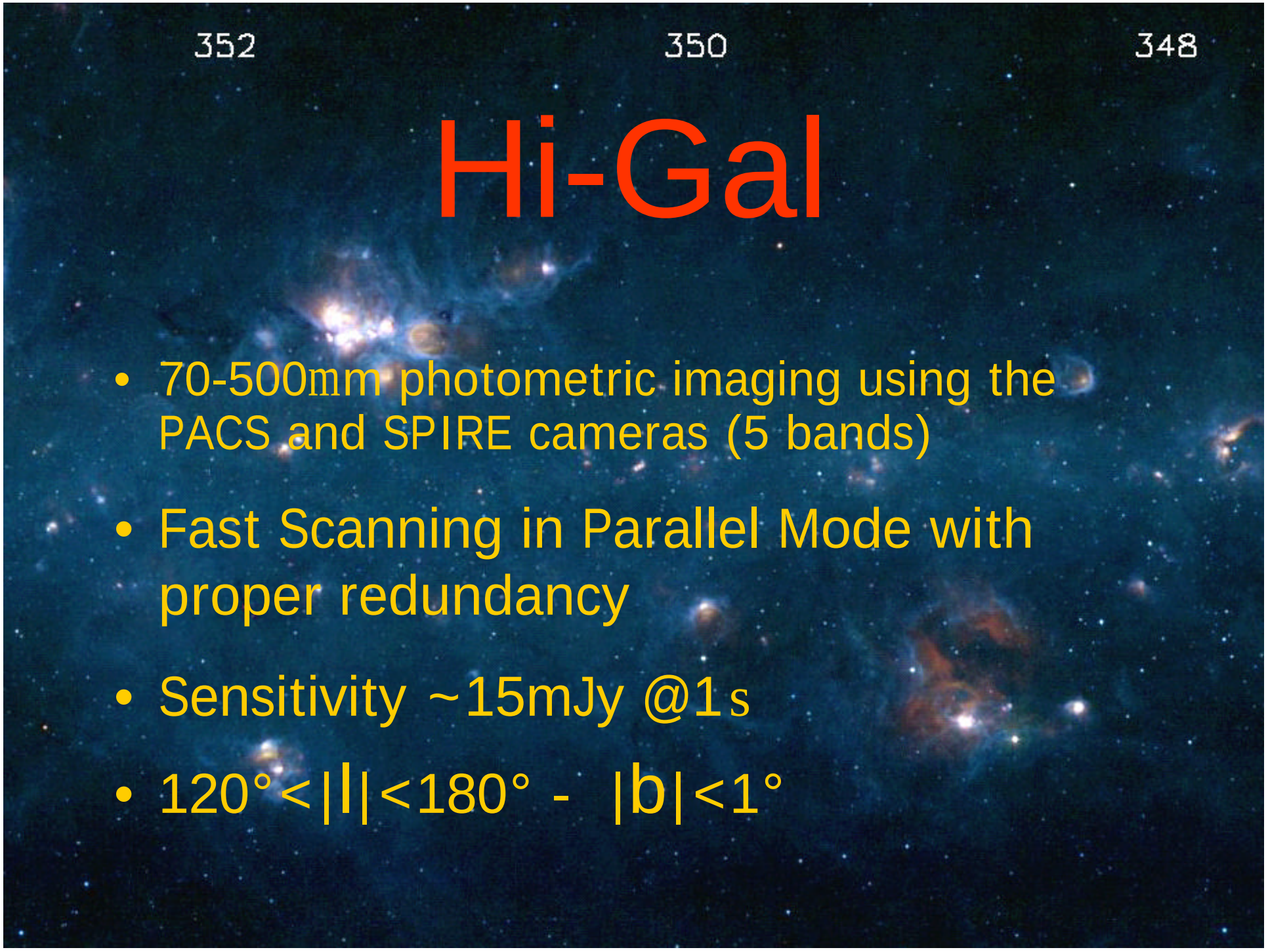
Broad Evolutionary classification of Star Forming Regions



Saraceno et al. (1996), Molinari et al. (in prep.)



- Galactic Inversion to measure the 3-D distribution of dust physical properties in the molecular, atomic and ionized phases of the diffuse ISM



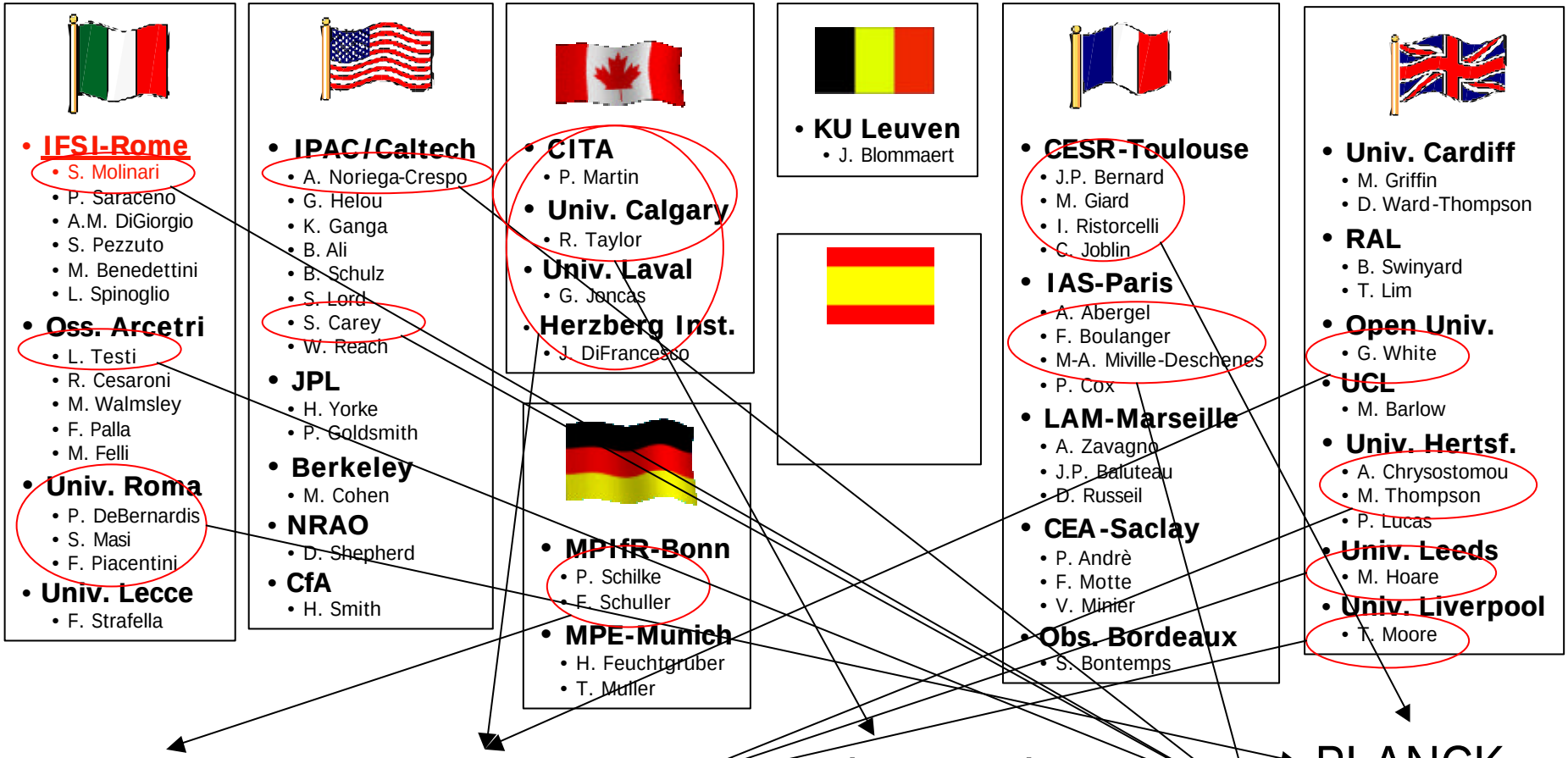
Hi-GaI

- 70-500mm photometric imaging using the PACS and SPIRE cameras (5 bands)
- Fast Scanning in Parallel Mode with proper redundancy
- Sensitivity ~15mJy @1s
- 120°<|l|<180° - |b|<1°

By-Products (fulfilling KP reqs!)

- Goldmine for Herschel follow-up (and IRAM and JCMT and APEX and CARMA and SMA and...)
- Accurate foreground estimate for the interpretation of cosmological backgrounds
- ALMA input catalogue
- Dust in SNRs
- Dust Life-cycle
  - ..High density, high irradiation, turbulent conditions, statistical significance
- Debris dust disks around MS stars
  - Unbiased statistics on frequency and mass as a function of star age
- Detection of detached dust shells around first ascent giant stars
  - Missing mass in AGB envelopes, limited to distant objects with unresolved envelope, detectable via long-wavelength excess.
- Detection of multiple shells around AGB stars, post-AGB objects and planetary nebulae, as well as around various classes of interacting binaries
- Detection of ejecta shells and swept-up ISM bubbles around massive stars
  - Complete census of WR and LBV stars
- Extinction maps
- Study of individual interesting Star Forming Regions (known or to be discovered)
- Nearby Low-Mass SFRs on the Galactic Plane
- ...

The Team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PLANCK
Spitzer/MIPSGAL