SPITZER/MIPSGAL:

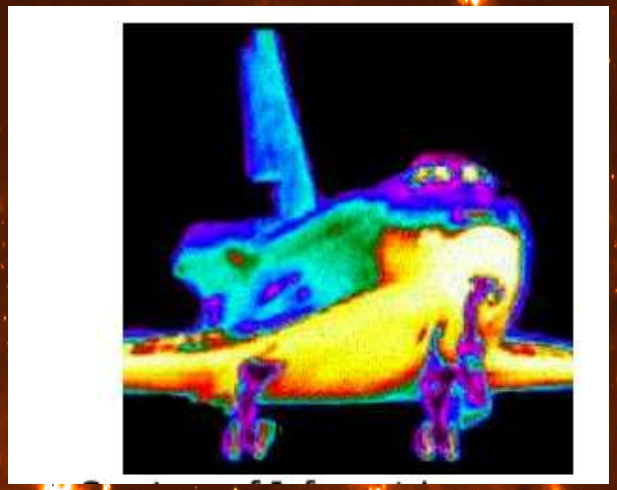
UNO SGUARDO INFRAROSSO DELLA GALASSIA INTERNA

Roberta Paladini - Spitzer Science Center/IPAC

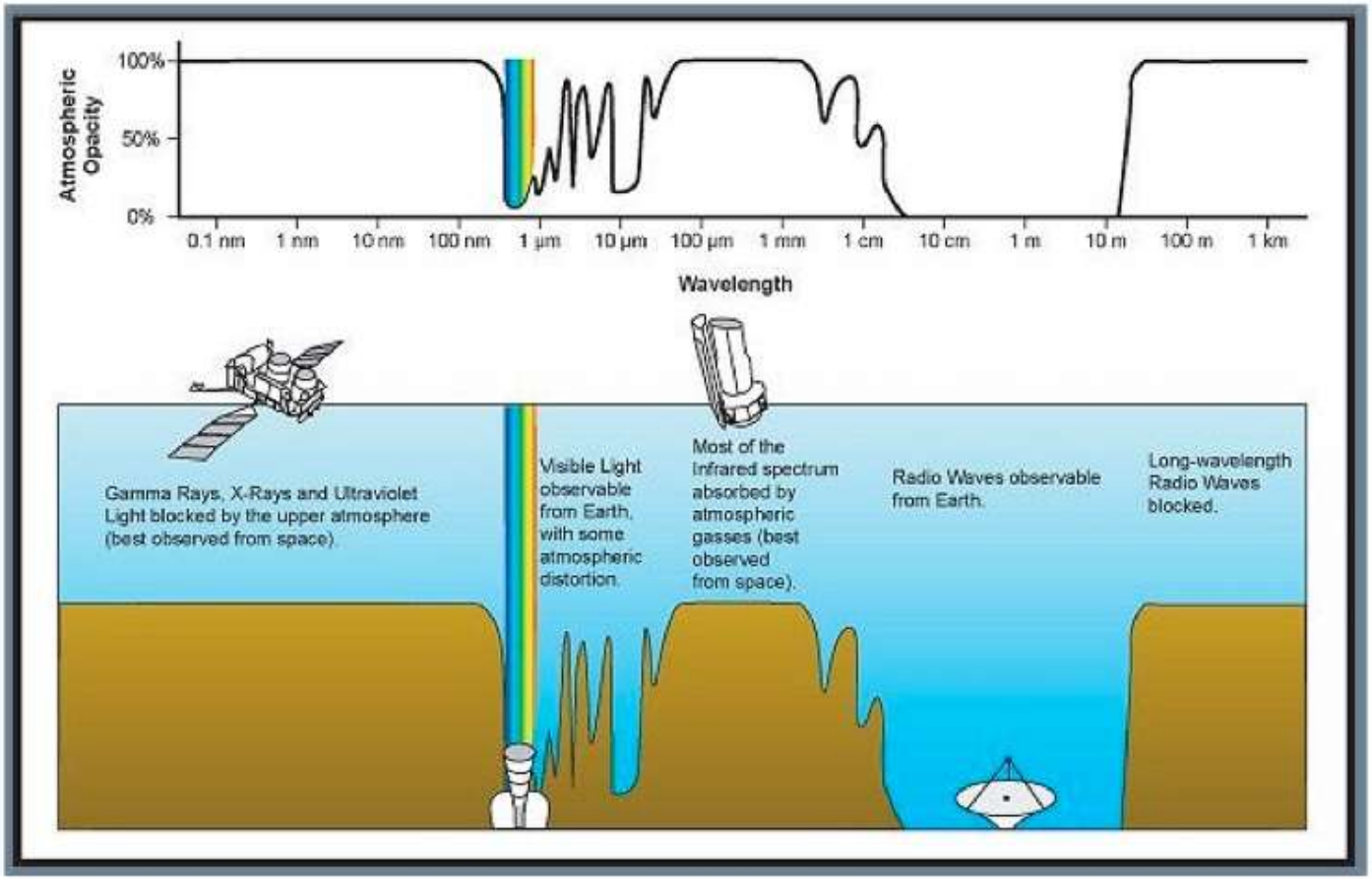
IASF - 28 giugno 2007

IL SATELLITE SPITZER

CHE COS'E LA RADIAZIONE INFRAROSSA ?



PERCHE' LO SPAZIO ?



25 AGOSTO 2003: INIZIA L'ERA SPITZER

Fast Facts

The Spitzer Space Telescope is a space-borne, cryogenically-cooled infrared observatory capable of studying objects ranging from our Solar System to the distant reaches of the Universe. Spitzer is the final element in NASA's Great Observatories Program, and an important scientific and technical cornerstone of the Astronomical Search for Origins Program.

Launch Date:	25 August 2003
Launch Vehicle/Site:	Delta 7920H ELV / Cape Canaveral, Florida
Estimated Lifetime:	2.5 years (minimum); 5+ years (goal)
Orbit:	Earth-trailing, Heliocentric
Wavelength Coverage:	3 - 180 microns
Telescope:	85 cm diameter (33.5 Inches), f/12 lightweight Beryllium, cooled to less 5.5 K
Diffraction Limit:	6.5 microns
Science Capabilities:	Imaging / Photometry, 3-180 microns Spectroscopy, 5-40 microns Spectrophotometry, 50-100 microns
Planetary Tracking:	1 arcsec / sec
Cryogen / Volume:	Liquid Helium / 360 liters (95 Gallons)
Launch Mass:	950 kg (2094 lb) [Observatory: 851.5 kg, Cover: 6.0 kg, Helium: 50.4 kg, Nitrogen Propellant: 15.6 kg]

Major Innovations

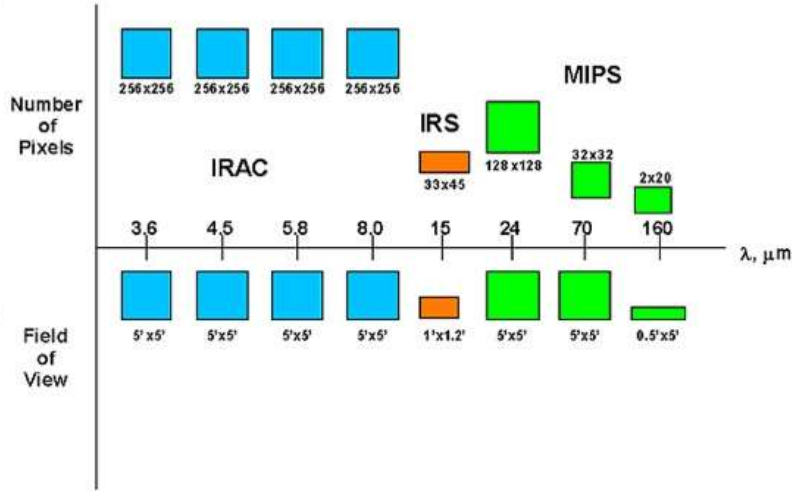
- Choice of Orbit
- Warm-Launch Architecture
- New Generation of Large-Format Detector Arrays
- Lightweight, cryogenic optics

The Spitzer Team

- Jet Propulsion Laboratory
- Spitzer Science Center, California Institute of Technology
- Ball Aerospace and Technologies Corporation
- Lockheed Martin Space System Company
- Smithsonian Astrophysical Observatory
- NASA-Goddard Space Flight Center
- Cornell University

SPITZER: GLI STRUMENTI

Spitzer Imaging Measurement Functionality:



Spitzer Instrumentation Summary:

Wavelength (microns)	Array Type	Resolving Power	Field of View	Pixel Size (arcsec)	Sensitivity [1] (microJy) (5 sigma in 500s, incl. confusion)
IRAC: InfraRed Array Camera					
3.6	InSb	4.7	5.21' x 5.21'	1.2	1.6 (3.4) [2]
4.5	InSb	4.4	5.18' x 5.18'	1.2	3.1 (4.3)
5.8	Si:As (IBC)	4.0	5.21' x 5.21'	1.2	20.8 (21)
8.0	Si:As (IBC)	2.8	5.21' x 5.21'	1.2	26.9 (27)
IRS: Infrared Spectrograph					
5.2 - 14.5	Si:As (IBC)	60-127	3.7" x 57"	1.8	250 [3]
13.5-18.5 18.5-26	Si:As (IBC) (peak-up) [4]	~3	1' x 1.2'	1.8	116 80
9.9 - 19.6	Si:As (IBC)	~600	4.7" x 11.3"	2.3	1.2×10^{-18} W/m^2
14.0 - 38.0	Si:Sb (IBC)	57-126	10.6" x 168"	5.1	1500
18.7 - 37.2	Si:Sb (IBC)	~600	11.1" x 22.3"	4.5	2×10^{-18} W/m^2
MIPS: Multiband Imaging Photometer for Spitzer					
24	Si:As (IBC)	5	5.4' x 5.4'	2.55	110 [5]
70	Ge:Ga	4	5.2'x2.6' 2.7'x1.4'	9.98 5.20	7.2 mJy [6] 14.4 mJy
55 - 95 [7]	Ge:Ga	15-25	0.32' x 3.8'	10.1	82/201/447 mJy (@60, 75, 90 um)
160	Ge:Ga (stressed)	5	0.53' x 5.33'	16x18	29 (40) mJy [8]

LA SURVEY MIPSGAL DI MIPS/SPITZER

IL TEAM DI MIPSGAL

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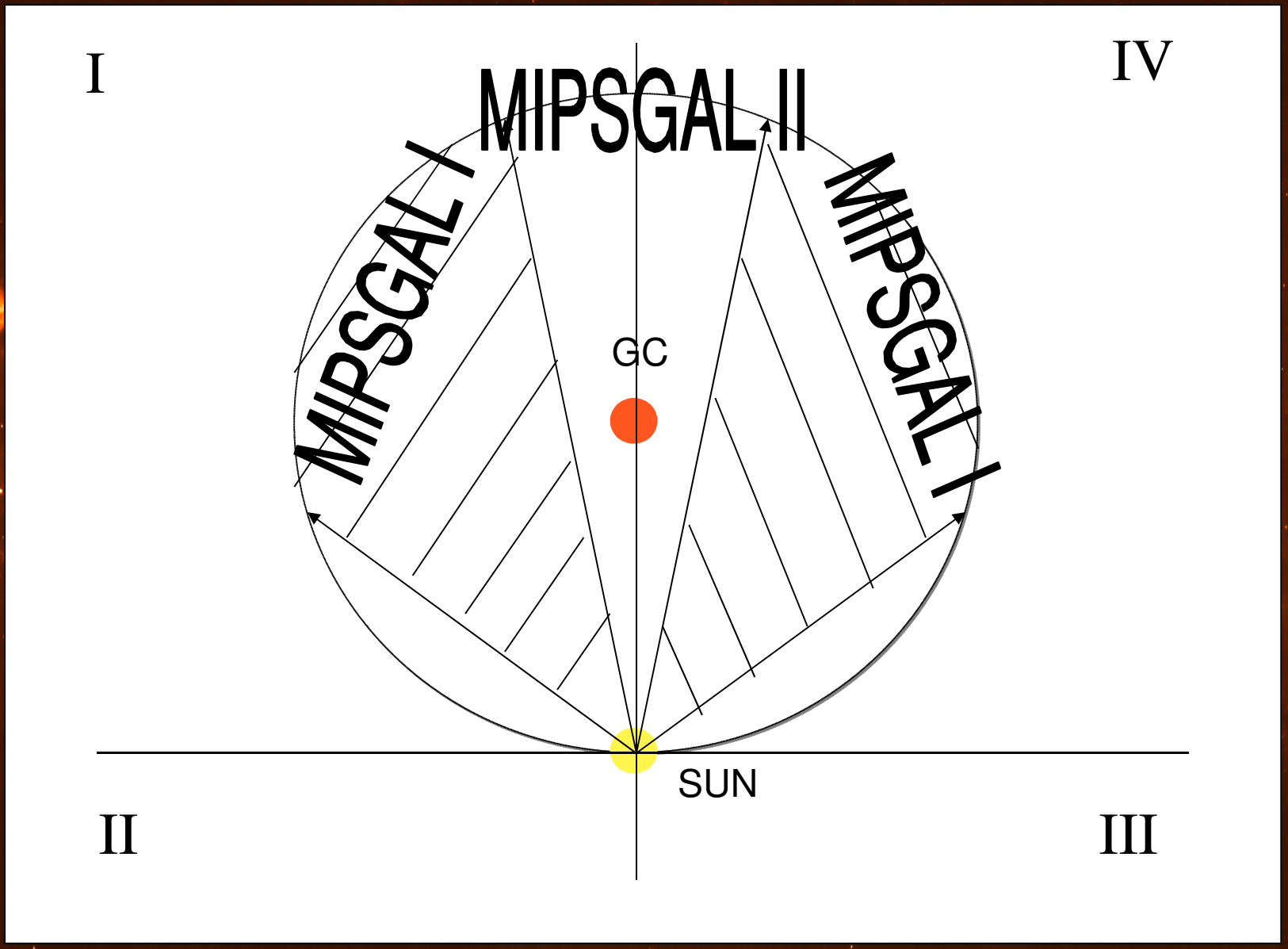
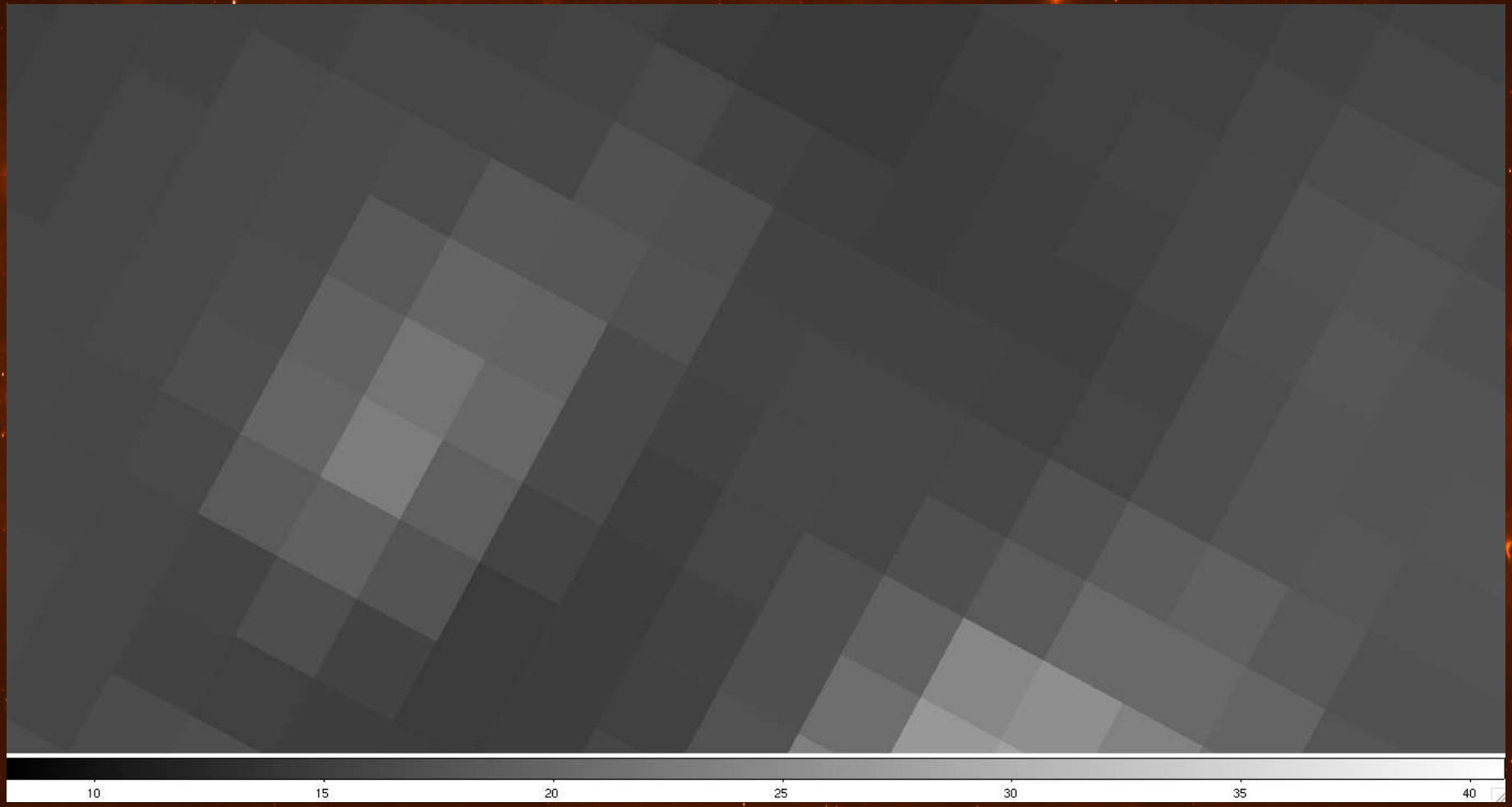

I
IV
MIPSGAL II
MIPSGAL I
MIPSGAL I
GC
SUN
II
III

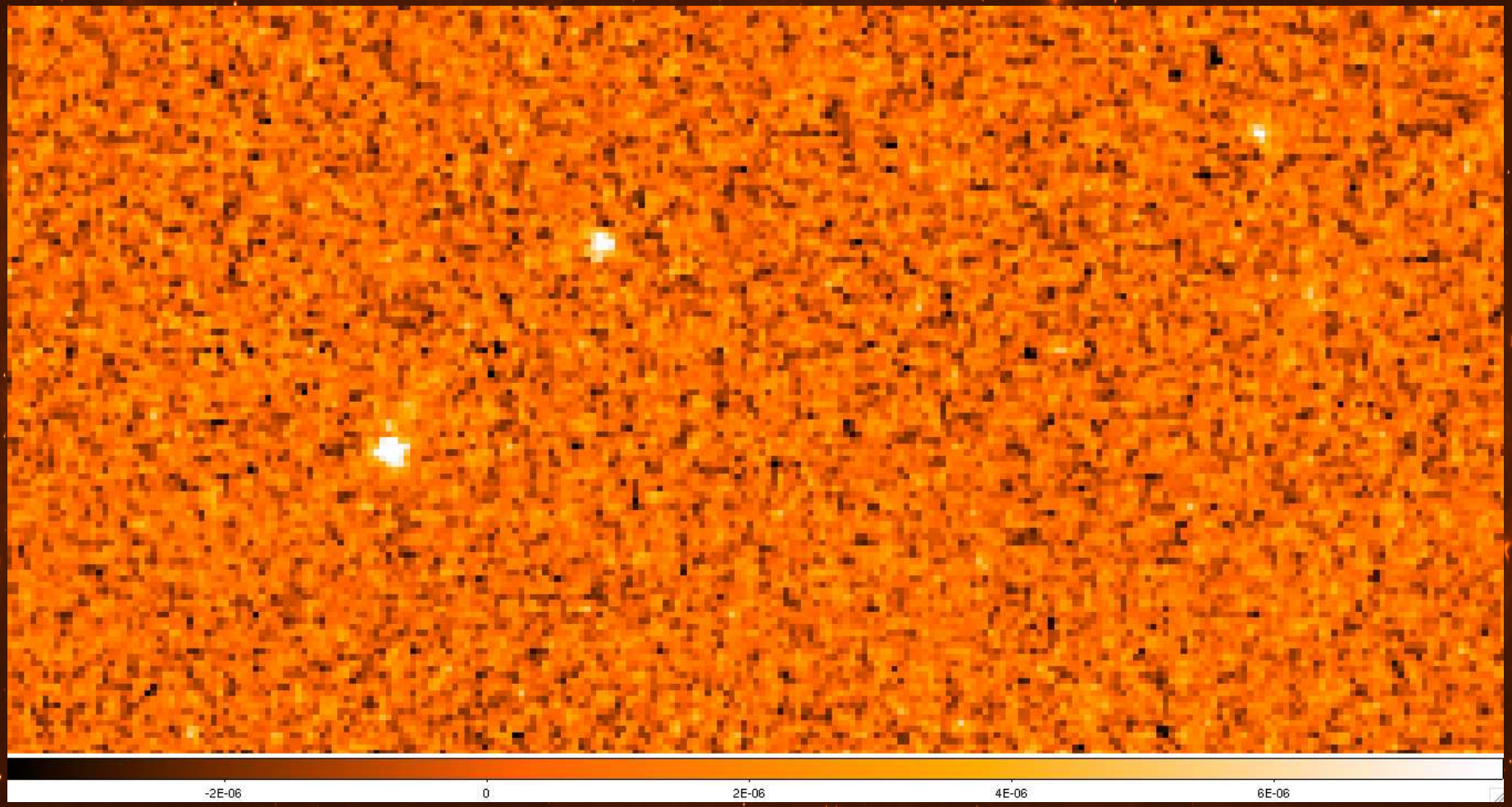
MIPSGAL : il contesto

Survey	**Copertura**	λ (μm)	**Risoluz. (sec)**	**Sensibilita (mJy)**
IRAS	all-sky	12,25,60, 100	> 60	325-1500
MSX	3600 sq deg	8.3, 12.1, 14.5, 21.3	20	158-1500
ISOGAL	16 sq deg	7, 15	6	9-45
GLIMPSE	220 sq deg	3.6, 4.5, 5.8, 8.0	~ 2	0.1-0.6
MIPSGAL	220 sq deg	24, 70	6, 18	1.3-51

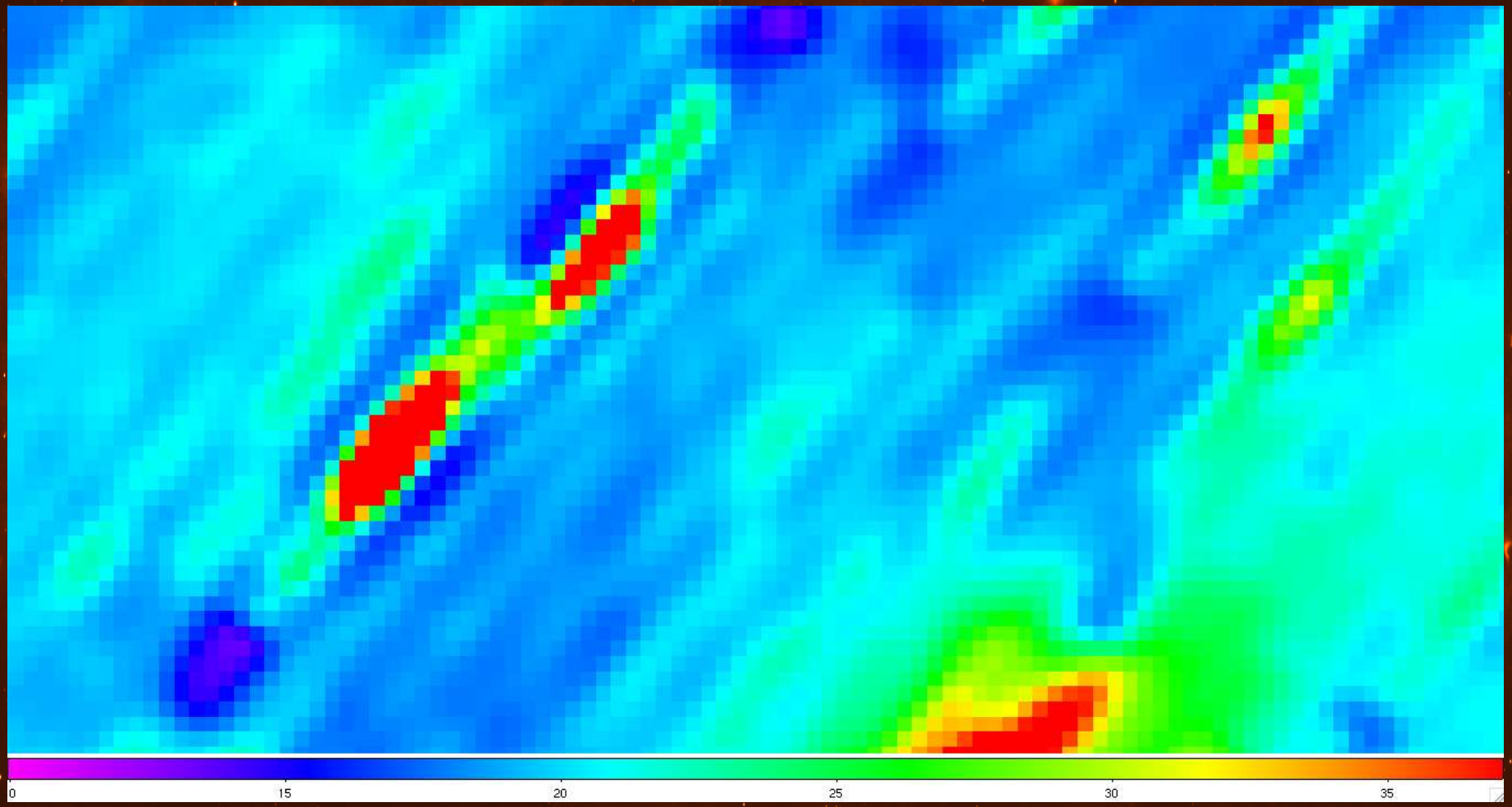
Prospettiva storica - IRAS



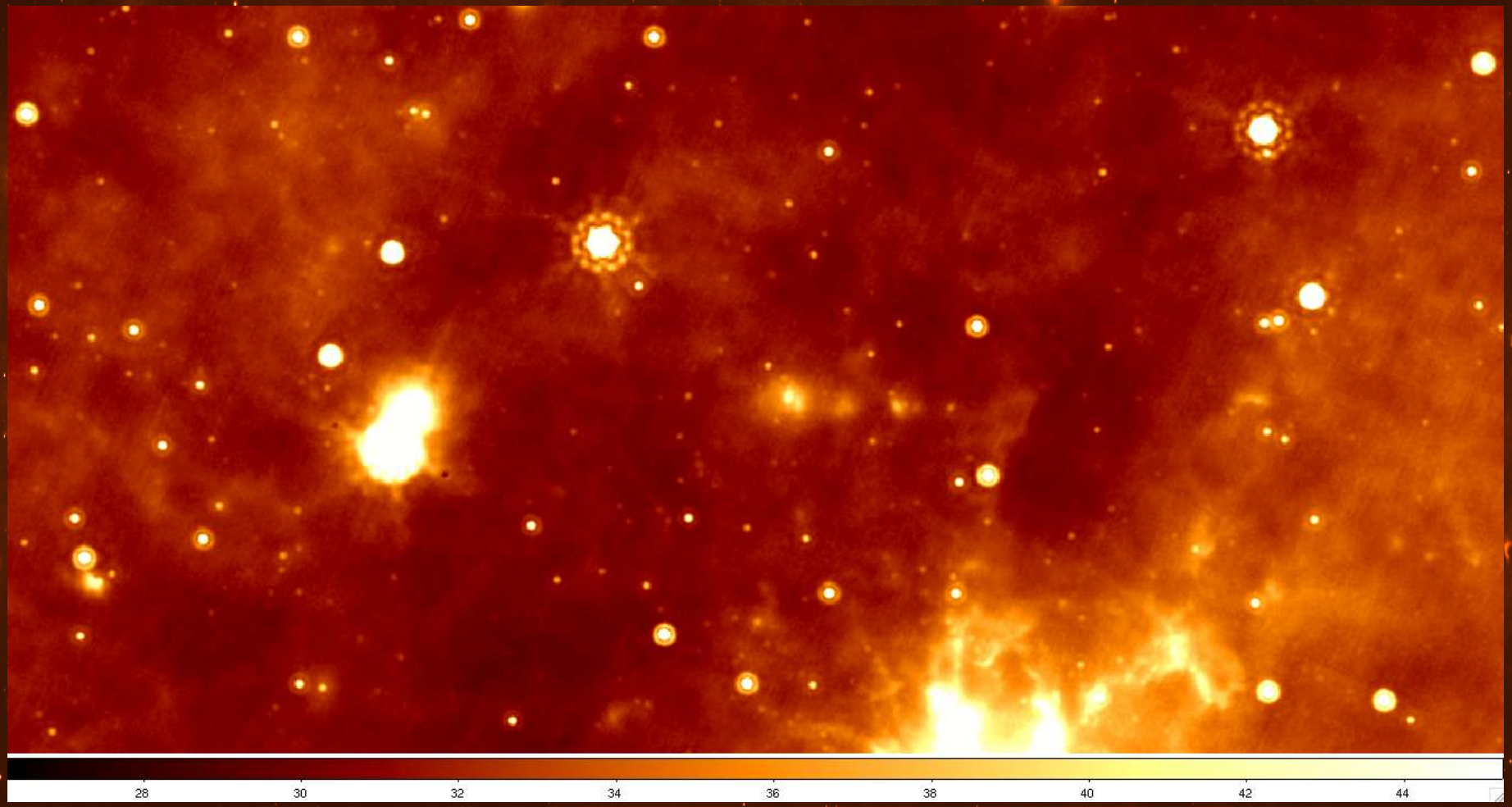
Prospettiva storica- MSX



Prospettiva storica- HiRes IRAS



Prospettiva storica- MIPS



MIPSGAL: una miniera d'oro per la scienza galattica !

- Mezzo interstellare
- Formazione stellare
- Nuova prospettiva sugli oggetti noti
- Estinzione
- Oggetti extragalattici
- Serendipity
- …..

GLIMPSE + MIPSGAL: ISM

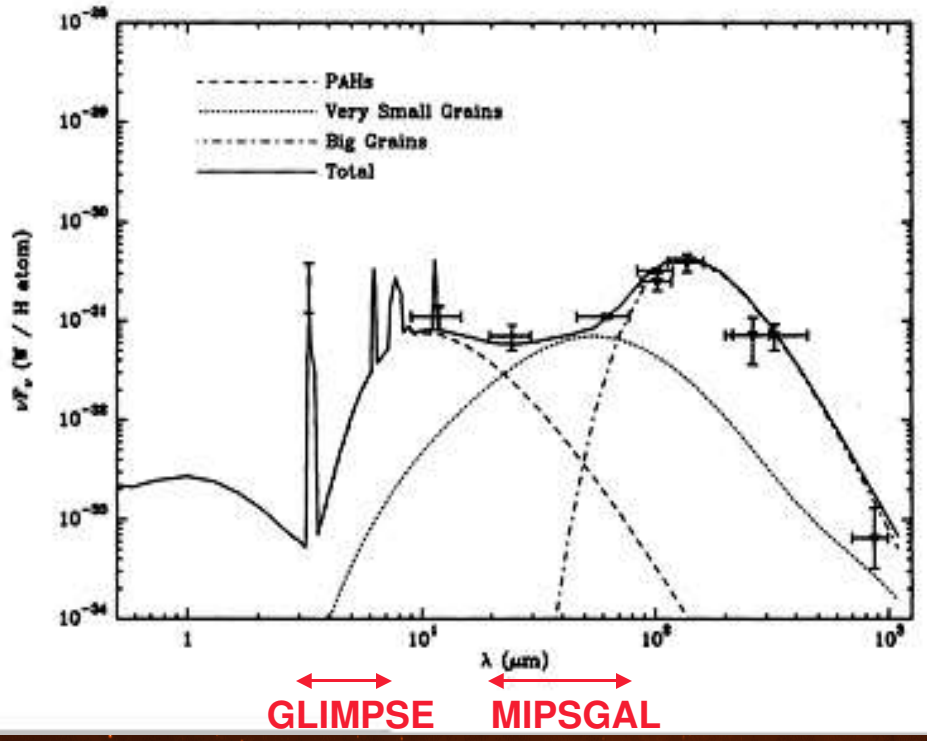
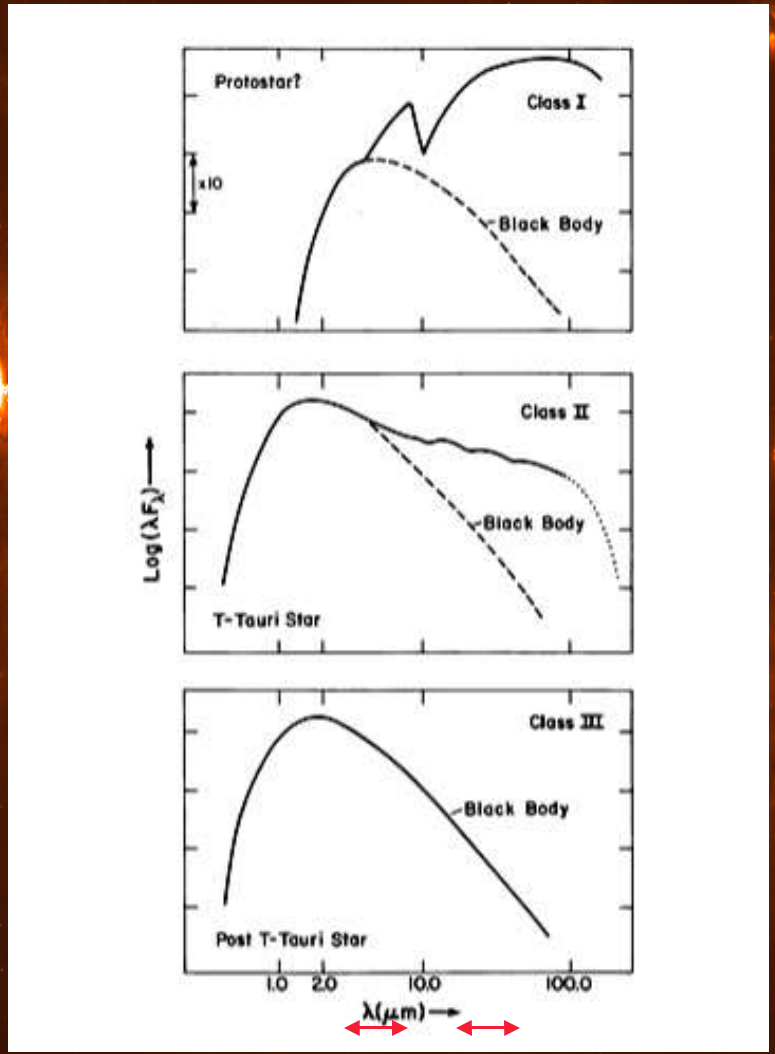


Fig. 4. Dust emission spectrum. Observations (crosses) pertain to the "cirrus" interstellar diffuse medium (see Table 1 and text). The horizontal bars represent the filter width used in the observations (given in Table 1). The model resulting spectrum (continuous line) is the sum of the three components that are PAHs, VSGs, and BGs.

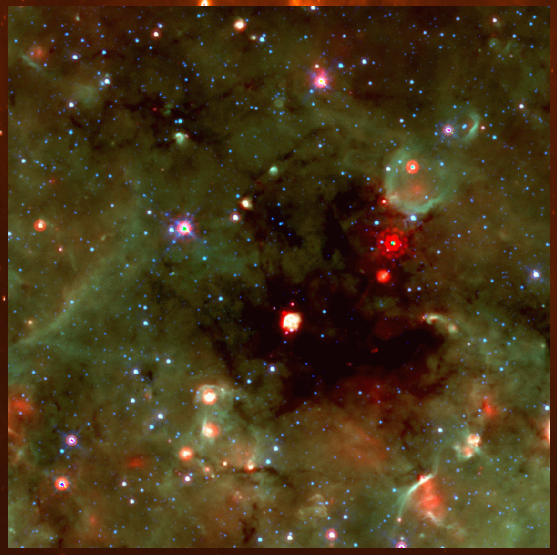
Desert et al. 1990

GLIMPSE + MIPSGAL: formazione stellare



Lada 1987

MIPSGAL:
UNA MINIERA DI NUOVE SORGENTI

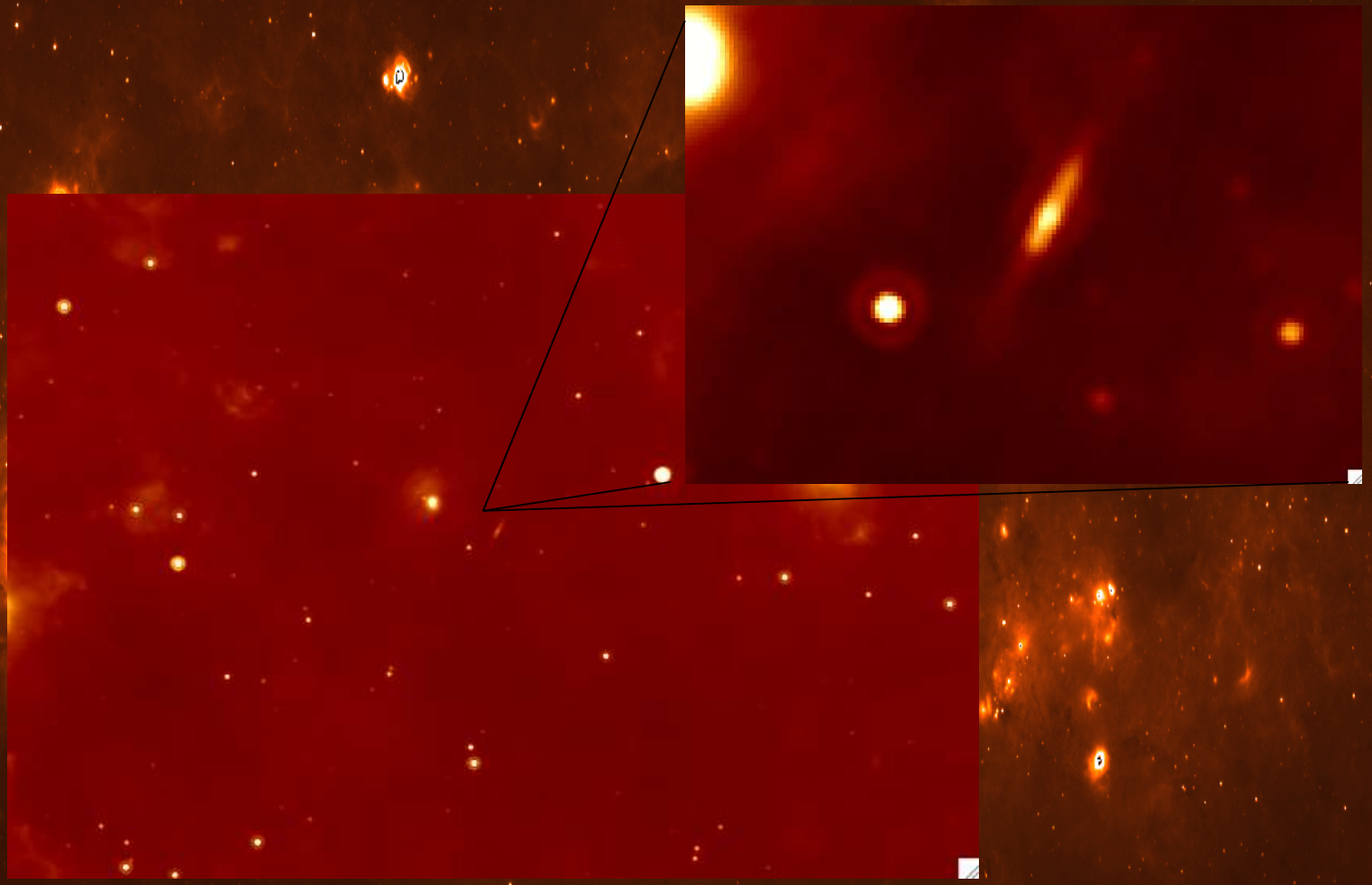


5.8µm

8µm

24µm

MIPSGAL: galassie nella ZOA

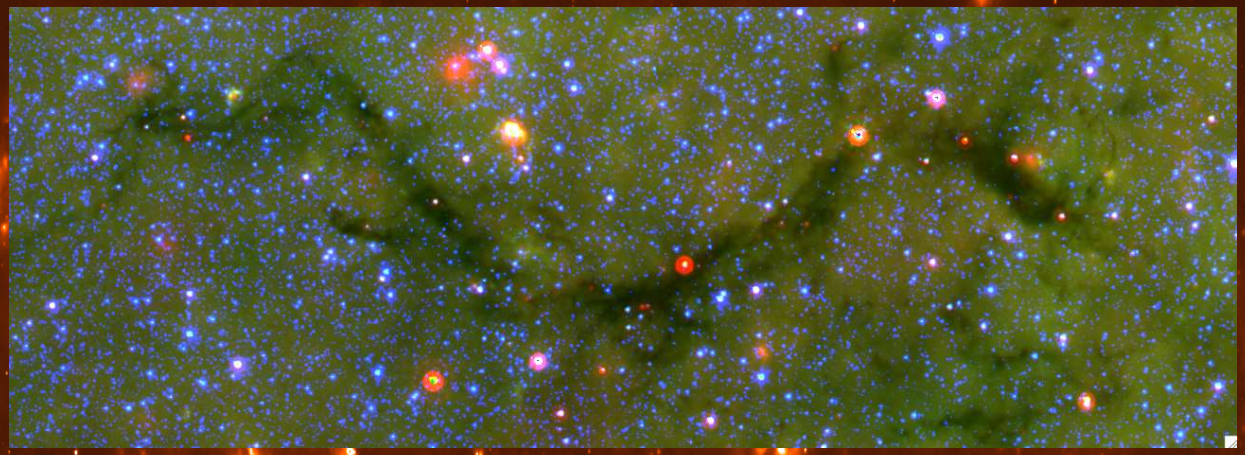


.... STAY TUNED !

-> Release dei dati attraverso IRSA:

- estate 2007: 24μm plates - prima parte
- fine estate 2007: 24μm plates - seconda (e ultima) parte / 24μm catalogo delle sorgenti
- autunno 2007: 70μm plates
- nel 2008: 70μm catalogo sorgenti

MIPSGAL: nuova luce sull'estizione



3.6μm
8μm
24μm

8μm
24μm
70μm