



# Infrared Array Camera (IRAC)

<http://ssc.spitzer.caltech.edu/irac/>

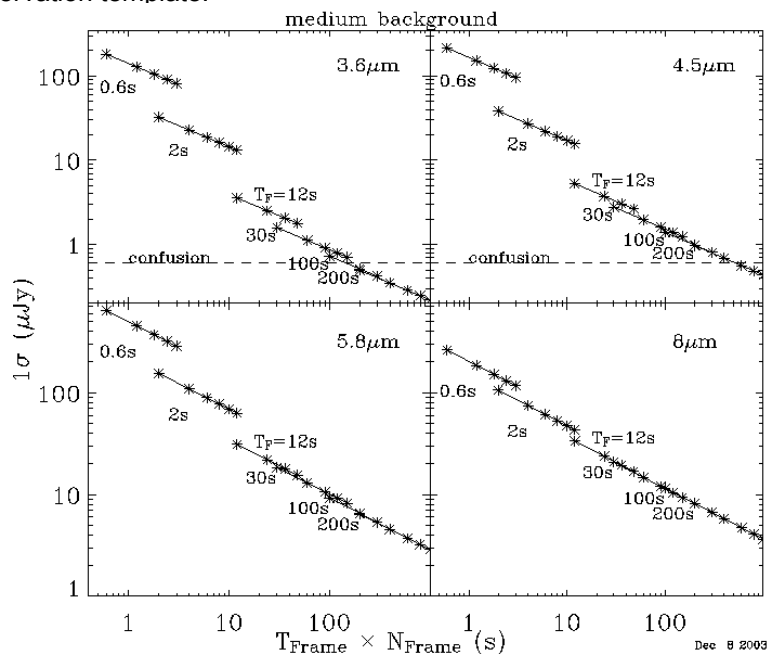


## Basic IRAC Capabilities and Sensitivity

IRAC is composed of four channels that provide simultaneous 5.2 arcmin X 5.2 arcmin images at 3.6, 4.5, 5.8, and 8.0 microns. Two adjacent fields of view are imaged in pairs (3.6 and 5.8 microns; 4.5 and 8.0 microns). All four detector arrays are 256 X 256 pixels in size, with a pixel size of 1.2 arcsec X 1.2 arcsec. IRAC provides capabilities for high dynamic range and subarray imaging of bright sources, stellar mode imaging (short channel 1 and 2 exposures simultaneously with long channel 3 and 4 exposures) as well as mapping in array or celestial coordinates. Several dither patterns are also available. The maximum duration of an IRAC observation is 8 hours. IRAC observing is done with the IRAC Mapping/Photometry observation template.

Table 1. IRAC characteristics.

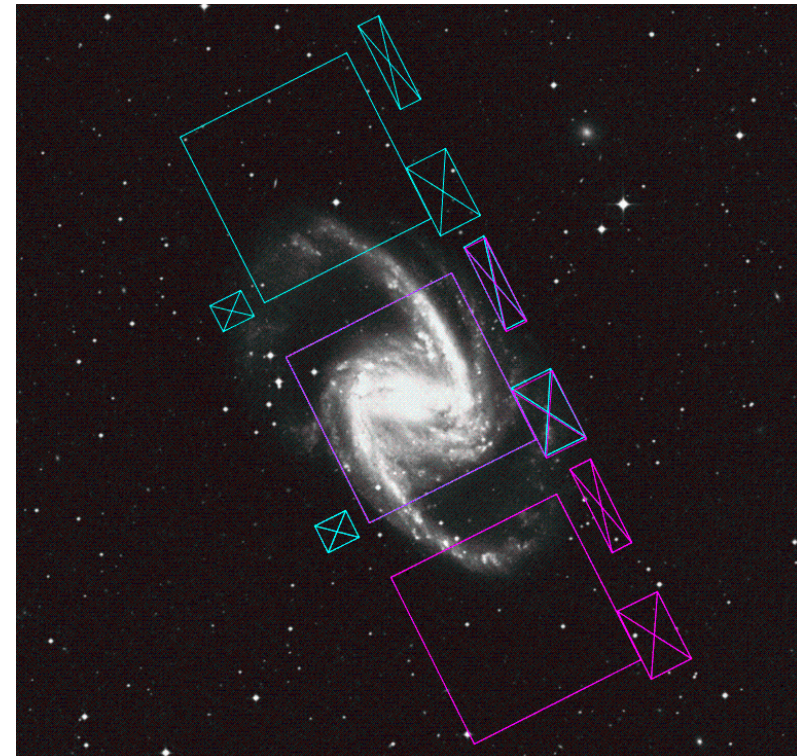
Channel No.	Array material	Wavelength ( $\mu\text{m}$ )	Read noise (e-; 30 sec)	Well depth (e-)	Noise pixels (Npix)	Typical background (MJy/sr)
1	InSb	3.6	7.8	145,000	7.0	0.15
2	InSb	4.5	7.5	140,000	7.2	0.44
3	Si:As	5.8	10.7	170,000	10.8	2.3
4	Si:As	8.0	6.9	200,000	13.4	9.3



**Figure 1:** Point source sensitivity plots for medium background. The lines show  $S/N = 1$  detection levels at the indicated frame times  $T_f$ . For diffuse emission, the surface brightness sensitivity per pixel is approximately  $0.03/(N_{\text{pix}})^{1/2}$  MJy/sr times the point source sensitivity.  $N_{\text{pix}}$  is the number of pixels contributing to the calculated point source noise. Allowed frame times range from 0.02 seconds in subarray mode to 100 seconds in full array mode.

## Saturation

In a 30 second exposure on a point source, the IRAC saturation levels are  $\sim 13, 13, 92$  and  $48$  mJy at 3.6, 4.5, 5.8 and 8.0  $\mu\text{m}$ , respectively. Long frames are background limited.



**Figure 2.** IRAC fields of view shown on top of a DSS image of NGC 1365. If both fields of view are selected for mapping, a pair of detectors will take an image centered on the target coordinates, while the other two detectors will image an adjacent field of view. The centers of the two fields of view are separated by 6.5 arcmin. The smaller rectangles are locations of IRAC stray light avoidance zones.