Infrared astronomy

IRAS circular 2

from the IRAS working group

THE Infrared Astronomy Satellite (IRAS) continues to work well and the IRAS science team presents here the second circular of new far-infrared sources discovered by IRAS. The main scientific goal of the mission is to carry out an all-sky survey in the wavelength range 10–100 μm and the IRAS catalogue is expected to be published during the second half of 1984. However because of the intense interest in the new IRAS sources from infrared and other astronomers, the science team has promised to publish regular circulars containing selected new sources. The team also hopes that observations of these sources at infrared and other wavelengths will provide useful feedback for the planning of the remainder of the mission.

The first circular (*Nature* **303**, 480; 1983) was the product of an intensive effort by science team members to identify IRAS sources with interesting classes of astronomical object. This proved to be a very time-consuming exercise and as most science team members are engaged either in an operational role or in data analysis the circulars would have come out rather infrequently had this format been maintained.

Instead it has been decided that in future the bulk of the sources for the circulars will be chosen at random from a subset of the IRAS data base, with certain restrictions (see below).

IRAS is a joint project between the USA, the Netherlands and the United Kingdom. □

from H. Habing and G. Neugebauer

STARTING with this issue, each IRAS circular will contain about 30–40 objects, chosen either at random from a subset of the IRAS database of objects already processed or by some member of the IRAS Science Team because the sources have particular interest for non-IRAS observations.

The randomly selected objects will be chosen from an area 20° wide in ecliptic longitude that has been recently processed during preparation of the IRAS catalogue of point sources. About half of them will be within 25° of the galactic plane. Further selection criteria are: (1) the source must have a signal-to-noise ratio of >30 in at least one wavelength band if within 25° of the galactic plane and >15 if outside; (2) the source must have been observed on at least 4 orbits; and (3) the source must have a colour temperature between 60 and 12 μm or 25 and 12 μm of less than 350K.

We shall thus be presenting a relatively unbiased microsample of the IRAS survey catalogue with normal stellar sources removed. We hope that by following these procedures we shall ensure a bi-weekly issue of the circulars. □

Photograph of a false-colour image of the IRAS 100-μm data in the vicinity of IRAS 0344 + 327P01, shown arrowed, believed to be a newly forming star still completely shrouded in the cloud of gas and dust from whch it is forming. The 'protostar' lies in a region of the sky identified at optical wavelengths as the dark cloud, Barnard 5, thought to be about 1,000 light years away. The white areas are regions of high 100-μm brightness. The temperature of the dust around the protostar, about 180K, high for interstellar material, suggests that the star is almost fully formed, and its low luminosity shows that its mass is probably no greater than that of the Sun. The white area in the lower portion of the photograph shows intense emission from hotter dust (300K) within a cloud of ionized gas (an 'HII region'), excited by far more massive young stars.

Source name IRAS	Coordinates RA/dec	Flux densities (Jy) at 12 μm	25 μm	60 μm	100 μm
0225+725P02	02 h 25 min 02 s +72° 30.6′	0.67	0.91	4.3	9.5
0225+727P02	02 25 50 +72 46.1	1.1	1.8	7.9	35
0253+604P02	02 53 13 +60 27.8	1.2	11	<1	<6
0254+605P02	02 54 54 +60 32.0	0.93	1.6	14	87
0257+700P02	02 57 13 +70 02.6	0.55	0.94	5.9	9.6
0259+601P02	02 59 53 +60 08.5	0.86	3.8	25	<8
0305+596P02	03 05 46 +59 41.4	1.7	1.5	34	100
0307+607P02	03 07 52 +60 46.0	12	16	5.0	<5
0313+599P02	03 13 31 +59 58.9	1.8	2.1	5.3	27
0314+601P02	03 13 31 +60 11.3	1.2	1.3	30	60
0318+633P02	03 18 12 +63 21.0	0.67	0.57	5.5	18
0320+613P02	03 20 03 +61 21.6	0.35	3.1	<0.5	48
0326+710P02	03 26 38 +71 02.6	2.2	4.8	2.5	<3
0341+678P02	03 41 45 +67 51.6	<0.2	0.59	4.1	28
0353+625P02	03 53 44 +62 35.8	2.2	3.8	6.1	8.6
0402+696P02	04 02 35 +69 40.7	<0.2	<0.2	4.2	29
0412+085P02	04 12 59 +08 32.8	<0.2	<0.3	2.2	7.4
0413+702P02	04 13 47 +70 16.1	0.62	2.3	1.5	<2
0413+122P02	04 h 13 min 47 s +12° 17.6′	<0.3	<0.3	2.2	3.2
0414+014P02	04 14 57 +01 24.9	<0.3	0.51	2.3	<1
0422+097P02	04 22 39 +09 44.6	<0.4	0.45	1.7	3.7
0425+106P02	04 25 06 +10 37.4	<0.2	0.48	1.7	5.2
0426−038P02	04 26 17 −03 52.7	0.24	<0.2	1.4	3.6
0428+075P02	04 28 29 +07 31.4	0.27	0.562	3.1	6.8
0429+066P02	04 29 18 +06 40.2	0.24	0.32	1.8	5.2
0429−058P02	04 29 25 −05 51.8	0.34	0.28	2.9	5.3
0433−032P02	04 33 36 −03 15.0	<0.2	0.21	1.6	6.1
0434−002P02	04 34 04 −00 14.8	0.28	0.33	1.4	7.1
0437−049P02	04 37 45 −04 57.8	<0.3	0.27	1.5	4.2
0440+005P02	04 40 21 +00 31.5	<0.2	0.52	1.9	7.0
0446−049P02	04 46 07 −04 54.4	<0.2	0.38	2.5	2.8
0447−024P02	04 47 28 −02 28.5	<0.2	0.27	3.1	4.5
0448−055P02	04 48 16 −05 30.2	<0.2	<0.3	1.0	3.8
0449−063P02	04 49 14 −06 18.9	<0.2	0.38	2.8	8.5
0450−044P02	04 50 49 −04 27.0	<0.4	0.23	1.5	3.5
0457−034P02	04 57 45 −03 25.5	<0.2	0.36	1.9	5.7
0502−043P02	05 02 18 −04 21.8	<0.2	<0.2	1.1	15

The source name consists of four parts: (1) 'IRAS' indicates the origin; (2) right ascension (RA) in hours and minutes, seconds omitted; (3) declination (dec) in decimal degrees, multiplied by 10 and then truncated (i.e. +32° 42.3 = +327); (4) an appendix starting with 'P' and followed by the number of the circular; this appendix stresses that the data are preliminary. The position is given at Equinox 1950.0, and the measurements were made between epochs 1983.1 and 1983.3.

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