(1E 0630+178), subsequently located to 3 arc s using the high-resolution imager on the same telescope system. Most of the emitted X-ray photons have energies below 1 keV with little evidence for interstellar absorption, indicating that the X-ray object cannot be more than 200 pc distant. A subsequent 10-hour observation with EXOSAT has confirmed the soft nature of the X-ray spectrum and a search for time variability is under way. A series of optical studies for this region of the sky has revealed a 21.3-magnitude point-like object, which is located at the edge of the error box of the Einstein satellite and which has an apparent lack of emission and absorption features, reminiscent of the Crab and Vela pulsars. Although the corresponding position on the Palomar sky survey is blank, a search of the 1955 Palomar plates by J. Bloeman of the Huygen's Observatory at Leiden has revealed an object, some 10 arc s away, which is not present in recent more sensitive (CCD) plates. The magnitude (M_R = 20–20.5) of the 1955 object is similar to that of the Einstein satellite's counterpart; if they are the same object, a proper motion of 0.37 arc s yr^{-1} and a distance of 100 pc are implied. By contrast, a series of astrometric observations between November 1982 and October 1983 by J. Lecacheux and co-workers has set an upper limit of 0.2 arc s yr^{-1} on the proper motion of this object.

What is this source? The combination of its point-like nature and high (~1,000) ratio of X-ray to optical luminosity rules out most known classes of X-ray objects, with the exception of low-mass binary systems and pulsars. The former seems unlikely because the measured low visual magnitude would place it at a distance of ~250 kpc which is incompatible with the lack of X-ray absorption. In any case, a pulsar is a more attractive orthodox candidate because the two galactic COS-B sources so far identified are pulsars and both show excess γ-ray luminosities.

Paradoxically, radio searches of the error box of the COS-B satellite have pinpointed a number of possible counterparts, none of which pulsates or coincides with the source identified by the Einstein satellite. One promising radio candidate, discovered using the 100-m Effelsberg telescope, has subsequently been identified with the quasar 0630+180 by the SAO/UAO Multiple Mirror Telescope. Should this distant quasar prove to be Geminga, at $L_\gamma \gtrsim 10^{49}$ erg s^{-1}, it would be the most luminous source of high-energy photons known, assuming isotropic emission. Alternatively, if it is a highly collimated γ-ray jet beamed towards the Earth, its luminosity would not be so great.

Although there is still no solution to the riddle of Geminga ("the source that is not there" in Milanese dialect), the detailed multi-waveband searches have demonstrated that it is dominated by γ-ray emission. Furthermore, whether a neutron star or a quasar, it is highly likely that Geminga offers the uncommon possibility of looking straight down a cosmic γ-ray beam. Finally, it is clear that, in the absence of temporal correlations across the wavebands, the question of what is the counterpart to Geminga will only be answered by use of a future γ-ray telescope with much improved angular resolution. □

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Astronomy

IRAS circulars 8 and 9

The source name consists of four parts: (1) the letters 'IRAS' to indicate the origin; (2) right ascension (RA) in hours and minutes and seconds; (3) declination (Dec) in decimal degrees, multiplied by 10 and then truncated (i.e. +32 deg 42.3 arc min becomes +327); (4) an appendix starting with 'P' and followed by the number of the circular; this appendix stresses that the data are preliminary. Position is given at equinox 1950.0. The measurements have been made between epochs 1983.1 and 1983.4 (for circular 8, below left) and between epochs 1983.1 and 1983.7 (for circular 9, below right).

The sources in circular 9 (below right) were selected because their flux densities have ratios compatible with those of the OH IR star discussed in a forthcoming paper in the *Astrophysical Journal Letters* (15 March 1984)by Olnon *et al*. The list may contain planetary nebulae. The sometimes very large upper limits to the 100-μm fluxes are due to high background at low galactic latitudes. Uncertain flux values are marked*. The sources were selected by H.I. Habing and F.M. Olnon, Sterrewacht, Leiden, Netherlands.

Source IRAS	RA h min s	Dec deg arc min	Flux density (Jy) 12 μm	25 μm	60 μm	100 μm
0412+287P08	04 12 25	+28 40.3	<0.4	<0.4	<0.4	4.3
0437+257P08	04 36 52	+25 39.2	4.8	7.4	7.8	24
0503+316P08	05 03 06	+3 36.0	<0.3	<0.5	<0.5	5.4
0513+455P08	05 13 07	+45 30.8	26	54	14	3.3
0621+495P08	06 21 04	+49 32.2	<0.3	0.54	4.0	9.4
1725+050P08	17 25 40	+05 04.7	17	17	3.5	2.1
1730+083P08	17 30 49	+08 22.7	12	14	3.5	<2
1744 +307P08	17 44 35	+30 43.3	<0.6	<0.3	2.0	6.1
1756+062P08	17 56 59	+06 17.4	<0.4	0.37	3.7	11
1806+241P08	18 06 16	+24 10.1	3.8	21	3.1	<1
1806+091P08	18 06 55	+09 11.7	66	72	13	5.7
1807+347P08	18 07 37	+34 45.6	28	26	5.0	2.3
1809+015P08	18 09 05	+01 30.9	<0.3	0.85	8.2	21
1809+270P08	18 09 31	+27 04.5	43	140	33	8.0
1809+149P08	18 09 35	+14 58.1	0.91	2.0	16	36
1812+051P08	18 12 21	+05 11.9	10	11	4.6	<3
1813+067P08	18 13 37	+06 43.7	<0.2	0.68	4.1	9.2
1814+220P08	18 14 34	+22 05.6	<0.3	0.61	6.8	18
1823+089P08	18 23 10	+08 55.0	4.6	4.5	0.74	<2
1823+218P08	18 23 43	+21 50.4	6.6	6.5	1.1	<1
1824 +012P08	18 24 37	+01 12.6	0.4	33	11	<7
1825+078P08	18 25 26	+07 50.4	5.6	6.9	1.4	<4
1826+227P08	18 26 18	+22 42.1	<0.3	056	5.3	13
1826+012P08	18 26 59	+01 16.6	3.2	7.1	12	26
1833+055P08	18 33 19	+05 33.3	280	380	00	32
1850−796P08	18 50 18	−79 37.8	<0.2	<0.4	1.5	3.6
1905−750P08	19 05 06	−75 02.3	7.4	7.5	2.0	<1
1927−746P08	19 27 31	−74 39.4	<0.3	2.3	<2	

Source IRAS	RA h min s	Dec deg arc min	Flux density (Jy) 12 μm	25 μm	60 μm	100 μm
0017+657P09	00 17 07	+65 42.9	26	37	8	6
0021+623P09	00 21 05	+62 21.5	45	54	14	7
0113+645P09	01 13 19	+64 34.9	4.2	49	141	125
0244+693P09	02 44 08	+69 23.0	12	23	18	21
1912+172P09	19 12 46	+17 17.3	12	20	10	<11
1913+215P09	19 13 26	+21 31.2	4.8	16.4	9.9	<5
1917+199P09	19 17 18	+19 56.1	4.6	7.5	2.5	<10
1920+156P09	19 20 02	+15 36.0	6.4	12	6.6	<36
1920+210P09	19 20 05	+21 01.5	10.9	27	12	<8
1922+302P09	19 22 29	+30 13.5	1.0	2.7	1.4	<3
1923+164P09	19 23 26	+16 27.1	0.9	8.0	17.3	<18
1923+167P09	19 23 39	+16 47.5	0.9	8.7	7.5	<16
1928+293P09	19 28 51	+29 23.6	37	61	18	9.4*
1930+141P09	19 30 37	+14 07.1	3.6	63	35	13
1937+239P09	19 37 28	+23 59.3	21	105	81	<9
1938+152P09	19 38 37	+15 13.1	35	35	5.9	<3
1938+154P09	19 38 46	+15 27.2	6.2	7.0	1.5	<3
1944+228P09	19 44 01	+22 52.0	15	30	14	<9
1945+293P09	19 45 24	+29 20.7	16	95	64	18
1945+172P09	19 45 55	+17 16.5	5.4	7.1	1.8	<2
1947+240P09	19 47 48	+24 01.2	10.0	58	31	<6
1952+279P09	19 52 03	+27 59.7	44	125	240	282
1953+280P09	19 53 28	+28 02.8	8.1	14	4.0	<10
1954+305P09	19 54 49	+30 35.9	70	115	47	15
1955+335P09	19 55 54	+33 33.2	43	52	15	<14
2005+185P09	20 05 40	+18 34.2	16	19	6	3
2010+308P09	20 10 23	+30 53.9	3.1	6.2	10.2	20.1*
2013+286P09	20 13 44	+28 38.6	4.1	9.3	2.6	<4
2016+275P09	20 16 01	+27 34.6	0.8	2.0	2.0	<3
2018+225P09	20 18 11	+22 34.2	25	34	8.0	<2
2326+689P09	23 26 49	+68 54.3	26	38	49	23
2332+657P09	23 32 07	+65 45.3	13	90	76	25