

**Central Bureau for Astronomical Telegrams  
INTERNATIONAL ASTRONOMICAL UNION**

Mailstop 18, Smithsonian Astrophysical Observatory, Cambridge, MA 02138, U.S.A.  
IAUSUBS@CFA.HARVARD.EDU or FAX 617-495-7231 (subscriptions)  
BMARSDEN@CFA.HARVARD.EDU or DGREEN@CFA.HARVARD.EDU (science)  
URL <http://cfa-www.harvard.edu/cfa/ps/cbat.html>  
Phone 617-495-7244/7440/7444 (for emergency use only)

*GRB 970111*

R. C. Butler, Agenzia Spaziale Italiana, Rome; L. Piro, E. Costa, and M. Feroci (cf. *IAUC* 6533); F. Frontera and D. Dal Fiume, TESRE, CNR, Bologna; J. Heise and R. Jager; B. Sacco, IFCAI, CNR, Palermo; L. Chippetti, IFCTR, CNR, Milan; A. Parmar, Space Science Department, ESTEC; L. A. Antonelli and D. Ricci, BeppoSAX, Rome; J. M. Muller, BeppoSAX, Rome, and SRON, Utrecht; and A. Coletta, C. De Libero, and L. Salotti, BeppoSAX, Rome, write: "BeppoSAX pointed its Narrow Field Instruments on the estimated position of GRB 970111 (*IAUC* 6533) during Jan. 12.09–13.38 UT. A quick analysis of the data shows two sources within the BeppoSAX WFC error box: (a)  $\alpha = 15^{\text{h}}28^{\text{m}}46^{\text{s}}.3$ ,  $\delta = +19^{\circ}44'50''$  (equinox 2000.0), with a MECS 2–10-keV flux of 0.0025 counts/s (corresponding to  $3.8 \times 10^{-13}$  erg cm $^{-2}$  s $^{-1}$ ) and a LECS flux 0.1–10-keV of 0.0037 counts/s ( $\sim 4.4 \times 10^{-13}$  erg cm $^{-2}$  s $^{-1}$ ); (b)  $\alpha = 15^{\text{h}}28^{\text{m}}48^{\text{s}}.3$ ,  $\delta = +19^{\circ}38'34''$ , with a MECS flux (2–10 keV) of 0.0013 counts/s ( $\sim 1.9 \times 10^{-13}$  erg cm $^{-2}$  s $^{-1}$ ). The spectrum of source 'a' is considerably softer than that of source 'b'. As some systematic effects can still be present, an error radius of 1' must still be assumed. Though the detection is highly significant, the countrates can have an uncertainty of 30 percent, due to systematic effects and to the application of a spectrum-independent correction for rough flux estimation."

W. Voges and T. Boller, Max-Planck-Institut für Extraterrestrische Physik, Garching; and J. Greiner, Astrophysikalisches Institut, Potsdam, report: "Within the 10' error box centered on the BeppoSAX position of the  $\gamma$ -ray burst 970111 (*IAUC* 6533), we have found three faint x-ray sources in the ROSAT all-sky survey data from 1991 Aug. 5–7, with the following positions (equinox 2000.0; estimated  $1\sigma$  error 45''), PSPC countrates and fluxes (assuming a power-law model with photon index of 2.0 but not corrected for any galactic absorption): source 1,  $\alpha = 15^{\text{h}}28^{\text{m}}40^{\text{s}}$ ,  $\delta = +19^{\circ}44'5$ ,  $0.045 \pm 0.015$  counts/s (0.1–2.0 keV) or  $2.5 \times 10^{-13}$  erg cm $^{-2}$  s $^{-1}$ ; source 2,  $\alpha = 15^{\text{h}}28^{\text{m}}59^{\text{s}}$ ,  $\delta = +19^{\circ}43'8$ ,  $0.012 \pm 0.06$  counts/s (0.5–2.0 keV) or  $3.1 \times 10^{-14}$  erg cm $^{-2}$  s $^{-1}$ ; source 3,  $\alpha = 15^{\text{h}}28^{\text{m}}43^{\text{s}}$ ,  $\delta = +19^{\circ}38'5$ ,  $0.026 \pm 0.011$  counts/s (0.5–2.0 keV) or  $6.6 \times 10^{-14}$  erg cm $^{-2}$  s $^{-1}$ . The BeppoSAX source 'a' appears to be resolved into ROSAT sources 1 and 2; the BeppoSAX source 'b' coincides well with ROSAT source 3. ROSAT sources 1 and 2 are softer than source 3. Within the error circle of each ROSAT source, there is more than one optical object."