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Phil. Trans. R. Soc. Lond. A 1981 **301**, 669

doi: 10.1098/rsta.1981.0150

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Detection of γ -ray lines

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[Abstract only]

Although detectable γ -ray line emission from various astrophysical sources has been predicted for over two decades, it is only recently that positive results have been obtained. The first unambiguous extraterrestrial lines were from the great solar flares of 2 and 4 August 1972, at 0.5, 2.2 and 4.4 MeV. Earlier reports from balloon observations of lines from the galactic centre and Cen A near 2.2, 4.4 and 6.13 MeV seem not to have been confirmed by more recent spacecraft observations. The 0.5 MeV line seems definitely to have been seen from the galactic centre region. Lines at various energies have also been detected from transient events and during cosmic γ -ray bursts. Earlier limits from balloons were at *ca.* 10^{-3} ph cm $^{-2}$ s $^{-1}$; recent observations and limits are nearer 10^{-4} ph cm $^{-2}$ s $^{-1}$. The Gamma-Ray Observatory to be launched in 1985 will carry an array of cooled Ge detectors whose sensitivity will be *ca.* 10^{-5} ph cm $^{-2}$ s $^{-1}$.

Note added in proof. Fund shortages have delayed the planned launch date and, furthermore, it is now unlikely that the detectors described above will be carried by the Observatory.