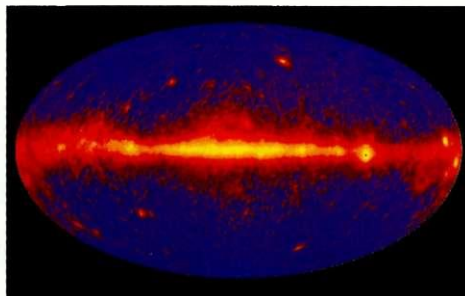


Edited by Emma Sanders

New eye on the sky



Integral, ESA's new gamma-ray satellite due for launch in April 2001.



The sky as seen by the EGRET detector on the Compton Gamma Ray Observatory.

A new satellite is nearing completion that will give astronomers an unprecedented view of the violent activity around black holes, starquakes and other strange phenomena. The International Gamma Ray Astrophysics Laboratory (Integral) will have a resolution 10 times better than current facilities of its kind.

The European Space Agency (ESA) plans to launch the satellite in April 2001 and use it to

study hard X-ray and gamma-ray sources in the energy range 15 keV to 10 MeV. A full-scale structural and thermal model of the telescope has just been completed ready for testing.

There will be two main instruments on board. A spectrometer made of high-purity germanium will measure gamma-ray energies extremely precisely whilst an imager will

record their position in the sky.

With a resolution of 12 arc-minutes it is the imager that excites astronomers the most. Current telescopes, such as NASA's Compton Gamma Ray Observatory, have difficulty pinpointing the source of gamma-ray emissions sufficiently to match them up with objects seen at other wavelengths.

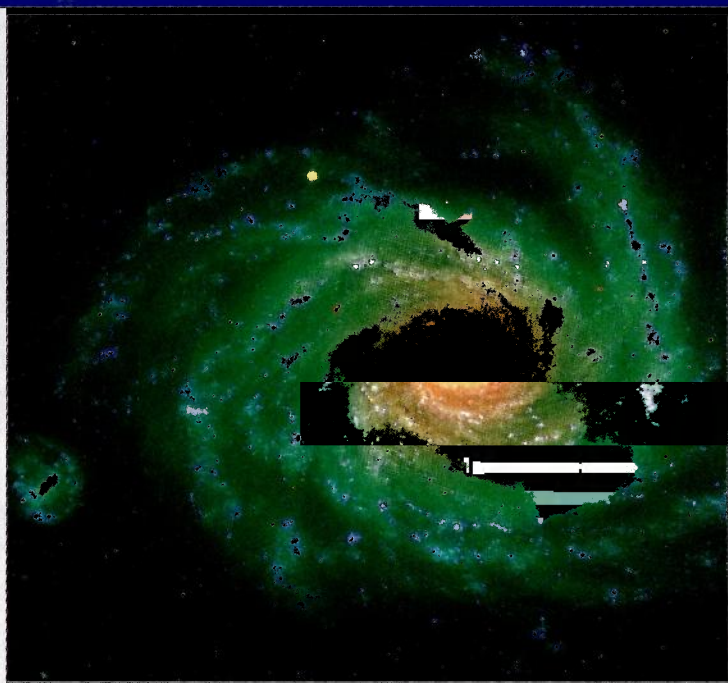
A breakthrough came last year when the Italian BeppoSax X-ray satellite identified the origin of a gamma ray burst. The observations showed the burst came from a galaxy towards the edge of the visible universe and must therefore be incredibly energetic – way over 10^{50} ergs, more than the energy released by all the 10^{11} stars in our Galaxy over several days! The mechanism fuelling gamma-ray bursts remains a mystery that astronomers hope Integral will help to solve.

Astronomers will also use Integral to study active galaxies and, nearer to home, to see close up to the accretion discs surrounding black holes.

Meanwhile, Integral's spectrometer will be used to measure the emission lines of heavy elements ejected into space by the supernova explosion at the end of a heavy star's lifetime.

Picture of the month

An image of the spiral galaxy NGC 1232 taken using the new FORS (FOcal Reducer and Spectrograph) instrumentation installed on the European Southern Observatory's Very Large Telescope. FORS was designed and built by Heidelberg State Observatory and the universities of Göttingen and Munich. Capable of operating in a variety of imaging and spectroscopy



modes, it is sensitive to light in the range 330 nm to 1100 nm. The detector is a CCD with 24-micron pixels. FORS will be used to investigate the faintest and most remote objects in the universe. (Picture: European Southern Observatory.)

Moon sheds light on Sun

Moondust contains traces of rare solar gases, krypton and xenon. This discovery, made by researchers at ETH Zurich, promises a unique archive of the life of the Sun.

Buffeted by the solar wind for over four billion years, the dust on the surface of the Moon has absorbed traces of rare gases. Moreover, the proportion of the gases varies according to the age of the sample. This means researchers will be able to learn more about the formation and evolution of the solar system.

Left-handed life

It's not just neutrinos that are left-handed, nearly all amino acids, vital for life, are left-handed as well. Now new observations using the Anglo-Australian telescope might explain the origin of life's left-handed bias.

Astronomers observed a region of the Orion nebula containing clouds of organic molecules. Most radiation, such as that from the Sun, is unpolarized, but in this case 17% of the radiation is circularly polarized. Astronomers believe this effect was caused by scattering of dust grains aligned in a magnetic field. Circularly polarized UV light could be responsible for the left-handedness of amino acids.