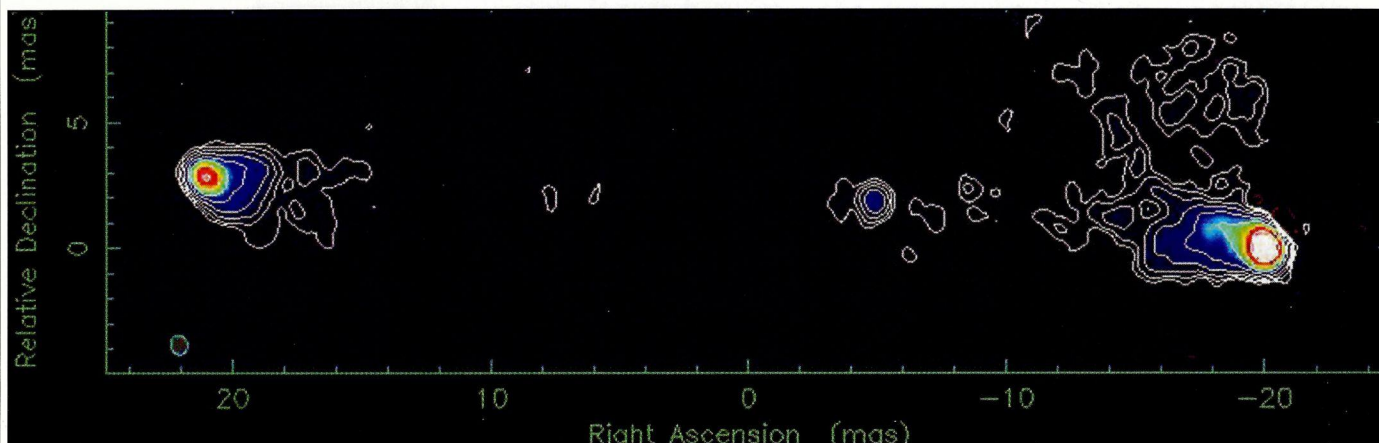


Edited by Emma Sanders

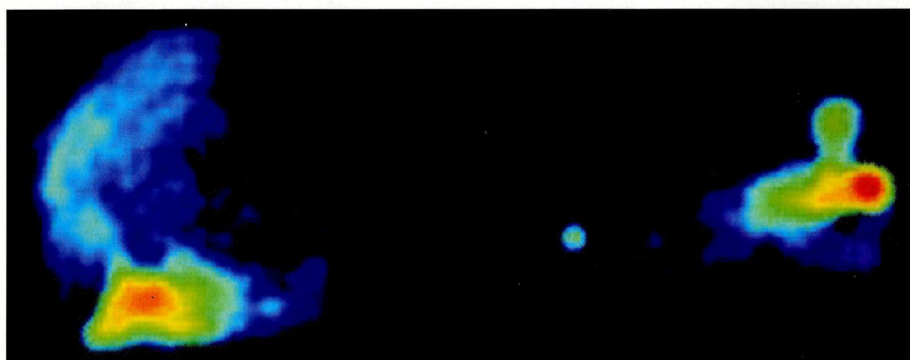
Youngest radio galaxies observed



Baby radio galaxy 1943+546 (left) is 336 light years across. Its big brother 3C295 (right) is 64 000 light years across. (A Polatidis and P Leahy.)

A new class of baby radio galaxy has been discovered using very long baseline interferometry. The sources, dubbed compact symmetric objects, are the youngest radio galaxies ever observed – a mere 1000 years old – and are expected to reveal clues to the birth and evolution of these cosmic powerhouses.

Such extreme sources could have links with gamma-ray bursts and high-energy cosmic rays. Radio galaxies are a well known phenomenon, characterized by enormous jets, up to millions of light years across, shooting out charged particles at up to almost the speed of light. Bright spots of emission are seen at the



end of the jets where the particles plough into the surrounding intergalactic medium, depositing around 10^{44} erg/s in energy.

The new galaxies are almost identical but on a smaller scale. Astronomers from the Onsala Space Observatory in Sweden and the

Max Planck Institute, Bonn, imaged them with 17 different radio telescopes around the Earth simultaneously. They calculate that the jets are expanding at around a fifth of the speed of light and therefore are around a 1000 years old – babies on cosmic timescales.

Magnetic fields point to high-energy rays

New evidence for strong intergalactic magnetic fields may help to solve the mystery of ultrahigh-energy cosmic rays. These particles can reach energies of more than 10^{20} eV – 100 million times as high as particle beams produced in accelerators on Earth.

At the May meeting of the American Physical Society, Phil Kronberg of the University of Toronto presented low-frequency (75 MHz) radio images of parts of the Great Wall supracluster of galaxies. The observations showed a diffuse synchrotron glow in the regions outside the galaxy clusters, revealing

the presence of magnetic fields.

New combined X-ray and radio observations of the clusters has improved the accuracy of measurements of both the magnetic field strength and the density of space in these regions. The team measured the Faraday rotation (the rotation of the plane of polarization) of the radio waves.

The results show intergalactic magnetic fields that are many times stronger than those within the much denser disc of the Milky Way. This means that a significant amount of energy is stored within the intergalactic gas.

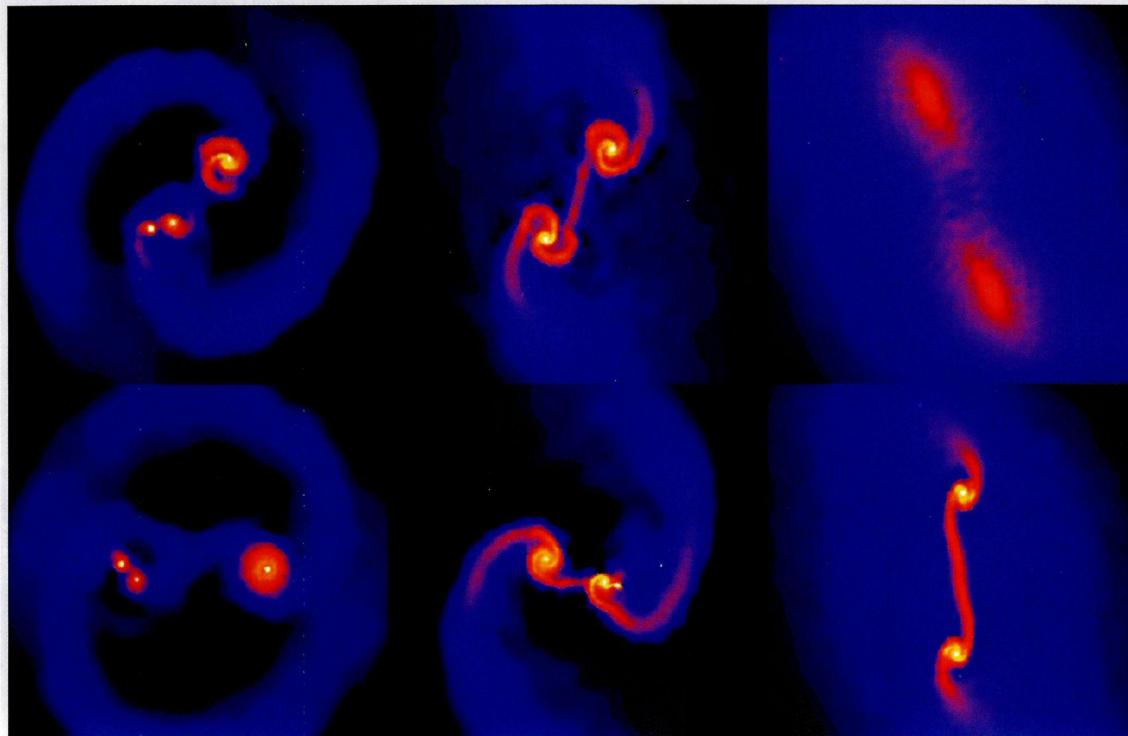
This raises important questions about the origin of magnetic fields – whether they were seeded by the first generations of stars and galaxies or result from earlier activity when the universe was less than 1 s old.

Large Magellanic Cloud X-ray signal lost in black hole

Newton, the European Space Agency's new X-ray observatory (April p11), was undergoing routine calibration, imaging a known, stable X-ray source in the Large Magellanic Clouds, when all of a sudden, the signal mysteriously disappeared.

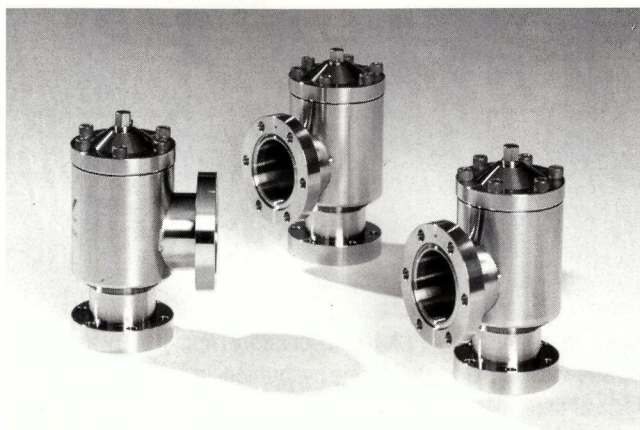
LMC X3 is a well known black hole candidate and the cut-off in its X-ray emission is entirely unexpected. X-rays come from the hot gas and dust swirling around the black hole as it is sucked towards the centre.

Picture of the month



This simulation shows the evolution of a triple star system over several hundred thousand years. The birth of stars is usually a secret affair, shrouded by dense clouds of dust. By comparing such simulations with observations of young star systems, astronomers can now find out more about the initial conditions. This work was carried out at the Institute of Astronomy in Cambridge, UK. (Matthew Bate.)

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