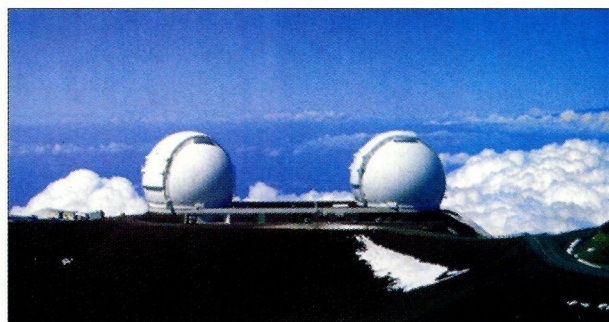
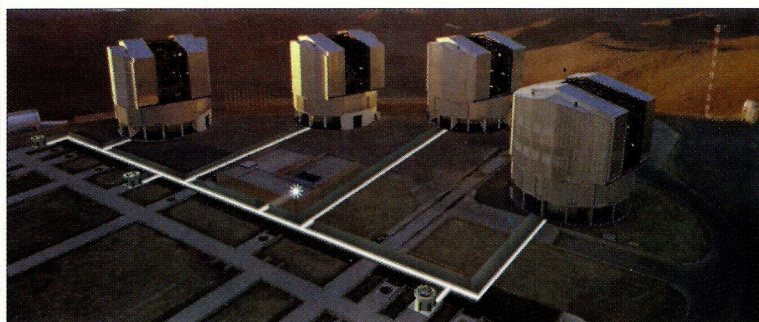


Keck heralds a new era for optical astronomy



Left: the VLT interferometer in Chile. The path taken by light is shown in white. (ESO.) Right: the Keck interferometer in Hawaii. (Keck.)

On the night of 12 March, the Keck interferometer in Hawaii began operations. It is currently the largest optical telescope in the world, with a resolution equivalent to that of a single telescope with a diameter of 85 m. Just five days later, interferometry began at the European Southern Observatory's Very Large Telescope (VLT) in Chile. The test was carried out with small 40 cm telescopes, but, when full-scale observations begin later in the year, the facility will give a resolution equivalent to that of a 200 m telescope.

Interferometry – combining data from several different telescopes to simulate the effect of using one large telescope – was originally the

preserve of radioastronomers. At longer wavelengths, the level of precision required to combine signals from the different telescopes is easier to obtain. Thanks to interferometry, milliarcsecond resolution has been commonplace in radioastronomy for many years.

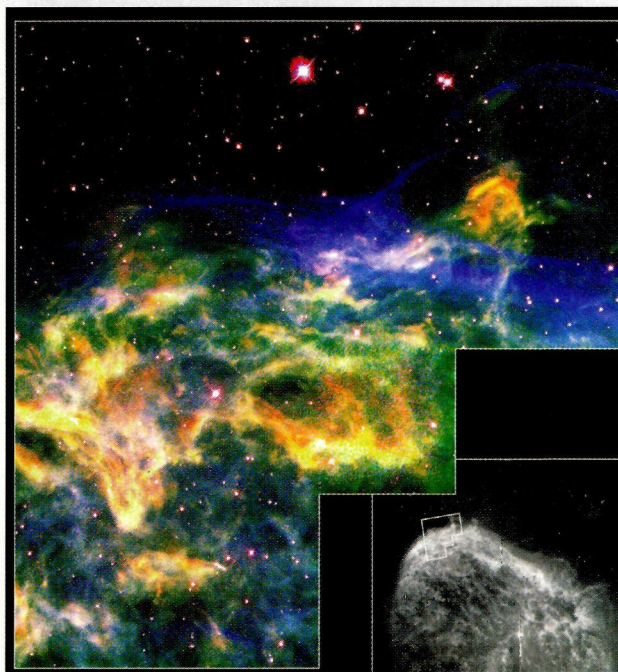
Owing to great technological advances, optical interferometry is finally catching up, opening the door to a wealth of new discoveries. In particular, astronomers can now look forward to the direct imaging of planets in other solar systems; seeing views of the surfaces of stars other than our Sun; studying the environment close to black holes; and looking back in time to the epoch when the first stars

and galaxies started to shine.

However, although interferometry increases the resolution of observations, sensitivity is much lower than that of a single large telescope. The mirrors do not collect as much light, so faint objects are difficult to image. The Keck interferometer consists of two 10 m telescopes made up of 1.8 m mirror segments. Meanwhile, the VLT has four 8.2 m telescopes and several 1.8 m auxiliary telescopes under construction. This larger collecting area will give increased sensitivity.

The future is exciting, and *CERN Courier* readers can look forward to some stunning "Pictures of the month" in years to come.

Picture of the month



The material thrown out from Wolf-Rayet star WR 136 is travelling at more than 6 million kilometres per hour. This image, captured using the Hubble Space Telescope, shows the shell of material being blown apart by the fierce stellar wind – a stream of charged particles ejected from the surface of the star. A picture taken by a ground-based telescope (lower right) shows almost the entire nebula. The structure is about 16 light-years wide and 25 light-years long. (NASA/ESA.)

Black hole survey

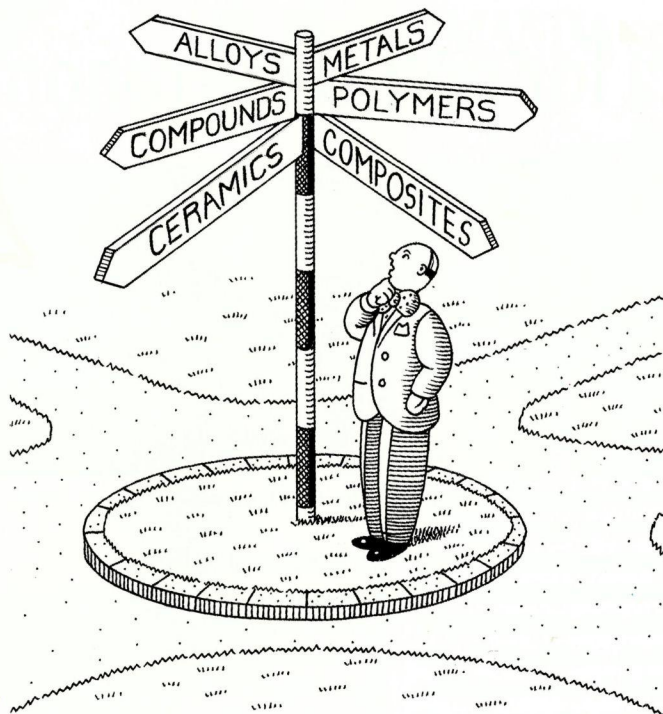
NASA has chosen the first six science projects for its Space Infrared Telescope Facility (SIRTEF). By far the biggest chunk of observing time will go to the Black Holes and Galaxies project – an infrared survey of galaxies up to 10 billion light-years away to find out whether black holes are the principal energy source in bright distant galaxies.

Other projects include a survey of the most distant galaxies to study galactic birth and evolution, and observations of the first stages of star formation taking place deep inside molecular clouds.

Infrared telescopes reach parts of the sky that other telescopes can't see. The radiation emitted by stars is absorbed by large dust clouds and the heated dust glows in the infra-red, revealing what would otherwise be hidden behind.

SIRTEF will be launched in July next year.

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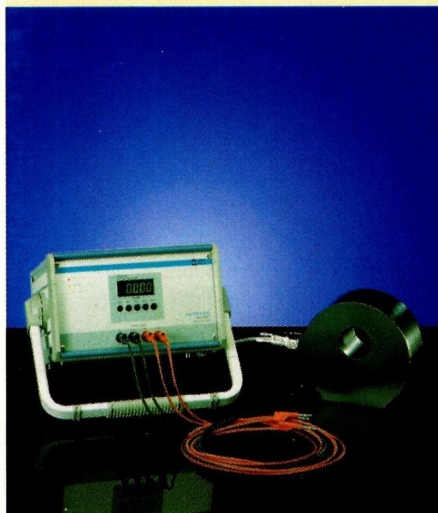
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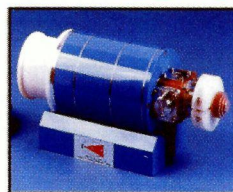


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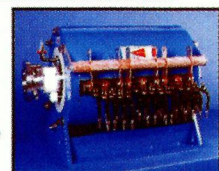
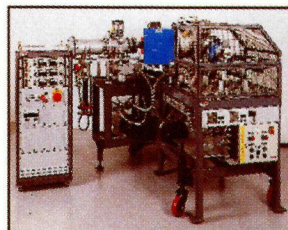
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