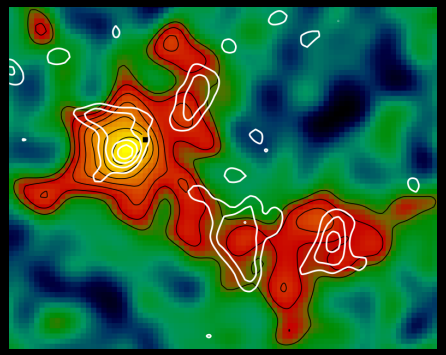
James Clerk Maxwell Telescope

With a 15-m dish, the James Clerk Maxwell Telescope (JCMT) is the largest telescope in the world dedicated to submillimeter astronomy. Operating between the infrared and radio waves, it uses some of the most sensitive and sophisticated instrumentation to detect the coldest material in the Universe, only a few tens of degrees above absolute zero. Water vapor in the Earth's atmosphere intercepts this radiation, making the high and dry site of Mauna Kea vitally important for the research performed at the JCMT.

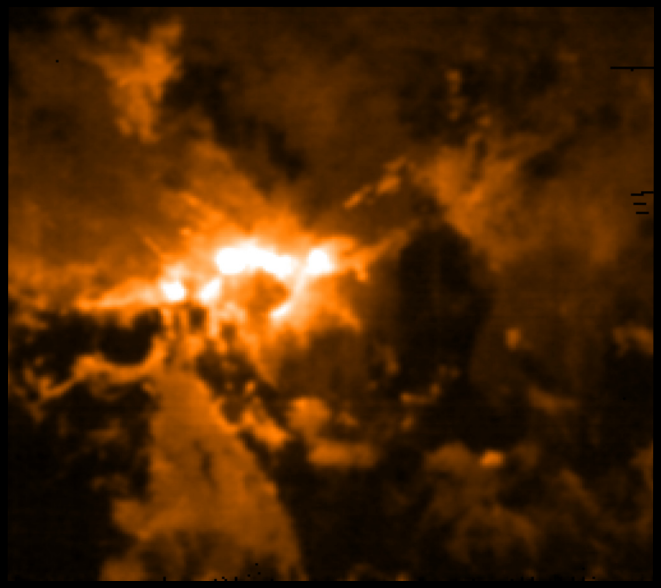
SCUBA-2 will be the most powerful camera of its kind. New technology and novel design means it will map the sky 1000 times faster than its predecessor. HARP is an instrument which combines a camera and a spectrometer. This means we can learn about the chemistry of interstellar gas, its temperature, density and motion.

Ambitous survey projects using these instruments will revolutionize our understanding of how the planets, stars and galaxies were born and evolved into the Universe we see today.

The JCMT is funded by the UK, Canada, and the Netherlands. It was opened in April 1987.



The bright object at the left is a quasar about 10 billion light years away. The whole structure is about one million light years long. There is substantial structure in the quasar's environment which may be forming new galaxies.



The Orion Nebula observed with HARP showing the carbon monoxide content. The bright region in the center reveals new star formation. Evident is the surrounding gas undergoing streaming motions both to and away from the region.

United Kingdom Infrared Telescope

The United Kingdom Infrared Telescope (UKIRT) has a 3.8-meter diameter mirror which collects infrared radiation from a wide range of astronomical objects.

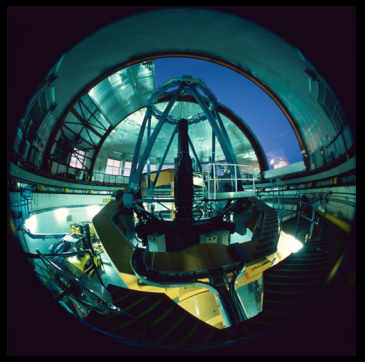
UKIRT studies everything from young stars, the interstellar medium, and mysterious brown dwarfs, to the most distant galaxies at the edge of the universe.

The telescope's primary mirror is of extremely high quality, and an extensive program of upgrades has allowed UKIRT to take full advantage of the excellent conditions on Mauna Kea.

UKIRT detects its light with a suite of advanced instruments capable of performing the three main types of infrared observations: imaging, spectroscopy, and polarimetry.

Its two most recent instruments are UIST (The UKIRT Imager Spectrometer) and WFCAM (the Wide Field Camera). UIST combines imaging and spectroscopy modes and a revolutionary "image slicing" mode. The light from an astronomical object—a star or a star-forming region, for example—is sliced into thin sections, each of which is spread into a spectrum. These spectra are then recombined to produce a three-dimensional view of the interactions between stars, cosmic dust and gas in these complex objects.

WFCAM covers two tenths of a square degree of sky in a single exposure, allowing UKIRT to carry out its current extremely ambitious survey of the infrared sky—the UKIRT Infrared Deep Sky Survey (UKIDSS).



Fisheye lens view of WFCAM at UKIRT with the telescope dome open at sunset.

UKIRT is funded by the United Kingdom. It was opened in October 1979.

Orion contains the closest birthplaces of massive stars, about 1500 light years from Earth. In this WFCAM image the central "Trapezium" cluster of stars illuminates clouds of gas and dust. This region is 11 light years across.