peaked spectrum (GPS) radio sources are extragalactic radio sources characterized by convex spectra peaking in the GHz range and steep at high radio frequencies. Only very few sources with extremely high (> 10 GHz) peak frequencies have been reported earlier. Recently, the group has identified several new extreme-peaking sources. Identifying high-peaked sources is related to the work on the Planck satellite's extragalactic foreground.

Work is currently going on with new data sets from the Metsähovi and RATAN-600 telescopes to search for new high-peaked sources, to study the variability behavior of *bona fide* GPS sources, to work on the models for inverted-spectrum sources and to study the contribution of the high frequency tail of the radio spectrum to the extragalactic foreground. Also, VLBI observations have been made of the extreme-peaking sources newly identified by the group.

*Radio properties of BL Lacertae Objects.* The two main BL Lacertae Object (BLO) subclasses, radio-selected BLOs and X-ray-selected BLOs are a product of different discovery techniques. It is not currently known whether these two classes of objects are two extremes of one class, or whether they have intrinsically different properties. A complete set of BLOs has been observed in Metsähovi, and additional observations using other facilities have also been made.

The study of the BLOs is also related to the Planck foreground science: if some of the X-ray selected BLOs turn out to be brighter than previously assumed, or if the number of Intermediate BLOs turns out to be large, then this information is also essential for the Planck mission.

*Correlations between the radio and high-energy behavior in AGNs.* The Metsähovi radio monitoring data are also used for studying the correlation between radio and high-energy domains: activity states and flares, differences in various source populations, etc. Multifrequency radio-to-submm data and VLBI images are used to study the radio-to-gamma connections. According to the studies of the group, the strong gamma-ray emission in AGNs clearly occurs after the formation of the radio shock in the relativistic jet, i.e. the site of the gamma-ray emission must be at a distance well outside the accretion disc or even the broad line region usually considered to be responsible for the gamma-ray emission.

*Instrumentation*

As part of its VLBI instrumentation project the group has recently designed and manufactured next generation VLBI recording systems that enable world record data acquisition rates: on March 12, 2003, the first European 1 Gbit/s VLBI experiment and on June 17, 2003, the first international 2 Gbit/s experiment.

Along with developing high-speed data recording systems for VLBI the Metsähovi team is also developing e-VLBI technologies. The team has been evaluating high-speed Internet protocols for e-VLBI and in the preliminary data transfer tests, the team has achieved an order of magnitude improvement to the normal TCP/IP transfer speed.

The Metsähovi group is also involved in the Alpha Magnetic Spectrometer (AMS) project. This instrument will be placed aboard the International Space Station. The project is a very large international collaboration project, in which Metsähovi's responsibility is the hardware and software for the ground-based high-rate data link, receiving science data from the instrument.

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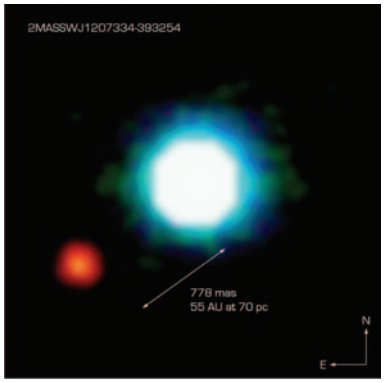
# Is this Speck of Light an Exoplanet?




**Is this newly discovered feeble point of light the long-sought bona-fide image of an exoplanet?**

A research paper [1] by an international team of astronomers [2] provides sound arguments in favour, but the definitive answer is now awaiting further observations.

On several occasions during the past years, astronomical images revealed faint objects, seen near much brighter stars. Some of these have been thought to be those of orbiting exoplanets, but after further study, none of them could stand up to the real test. Some turned out to be faint stellar companions, others were entirely unrelated background stars. This one may well be different.

In April of this year, the team of European and American astronomers detected a faint and very red point of light very near (at 0.8 arcsec angular distance) a brown-dwarf object, designated 2MASSWJ1207334-393254. Also known as "2M1207", it is a member of the TW Hydrae stellar association located at a distance of about 230 light-years. The discovery was made with the adaptive-optics supported NACO facility at the 8.2-m VLT Yepun telescope at the ESO Paranal Observatory (Chile).

The feeble object is more than 100 times fainter than 2M1207 and its near-infrared spectrum was obtained with great efforts in June 2004 by NACO, at the technical limit of the powerful facility. The spectrum shows the signatures of water molecules and confirms that the object must be comparatively small and light.

None of the available observations contradict that it may be an exoplanet in orbit around 2M1207. Taking into account the infrared colours and the spectral data, evolutionary model calculations point to a 5 jupiter-mass planet in orbit around 2M1207. Still, they do not yet allow a clear-cut decision about the real nature of this intriguing object. Thus, the astronomers refer to it as a "Giant Planet Candidate Companion (GPCC)".

Observations will now be made to ascertain whether the motion in the sky of GPCC is compatible with that of a planet orbiting 2M1207. This should become evident within 1-2 years at the most.

**ESO Press Release 23/04**

[1] The research paper (A Giant Planet Candidate near a Young Brown Dwarf by G. Chauvin et al.) will appear in Astronomy and Astrophysics on September 23, 2004 (Vol. 425, Issue 2, page L29). A preprint is available as astro-ph/0409323.

[2] The team consists of Gael Chauvin and Christophe Dumas (ESO-Chile), Anne-Marie Lagrange and Jean-Luc Beuzit (LAOG, Grenoble, France), Benjamin Zuckerman and Inseok Song (UCLA, Los Angeles, USA), David Mouillet (LAOMP, Tarbes, France) and Patrick Lowrance (IPAC, Pasadena, USA).