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The 'eyes' of Herschel will survey the Trans-Neptunian Region

In the Framework of the Key program "TNOs are Cool: A Survey of the Trans-Neptunian Region", Herschel will reveal the physical properties of the poorly known objects orbiting beyond Neptune.

The Herschel Space Observatory, one of the cornerstone missions of the European Space Agency with participation from NASA, was launched successfully in May this year. Herschel is the only space facility ever developed to cover the far infrared to sub-millimeter parts of the electromagnetic spectrum, to capture the thermal radiation of objects. Herschel is set up to start this month the phase of science demonstration, and afterwards the phase of routine observations. Scientists are looking forward to these scientifically exciting data in the years to come, including observations of trans-Neptunian objects (TNOs).

Over one thousand objects have been discovered orbiting beyond Neptune. These TNOs represent the primitive remnants of the planetesimal disk from which the outer planets formed. It is the accessible analog for unseen dust parent-bodies in debris disks around other stars similar to the Sun. Then direct observations of parent bodies of our own debris disk will be accessible. Deriving dynamical and physical properties of these bodies provides unique and important constraints on formation and evolution models of the outer Solar System.

While the dynamical architecture in this region (also known as the Kuiper Belt) is becoming relatively clear, the physical properties of the objects are only beginning to be revealed. In particular, fundamental parameters such as size, albedo, density and thermal properties are difficult to measure. Measurements of their thermal emission, which peaks at far-infrared wavelengths, offer the best means available to determine those physical properties.

The project "TNOs are Cool: A Survey of the Trans-Neptunian Region", has been given one of the largest amount of observing time (400 hours) in the world-wide call for open-time projects on the Herschel Space Observatory. It will observe around 140 TNOs. Thomas Mueller, from the Max-Planck-Institut für Extraterrestrische Physik in Germany, is leading the project. Several institutions are partners in this legacy program, including the University of Arizona, the Northern Arizona University and the University of California. Dr. Miriam Rengel, team member and scientists from The Max Planck Institute for Solar System Research said, 'This project is considered as a benchmark for understanding the solar system debris disk, and extra-solar ones as well'.

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