Global view of valleys on Titan shows north south contrast

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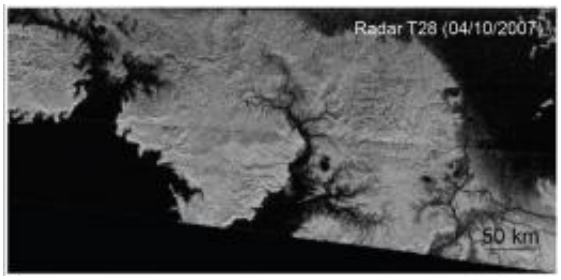
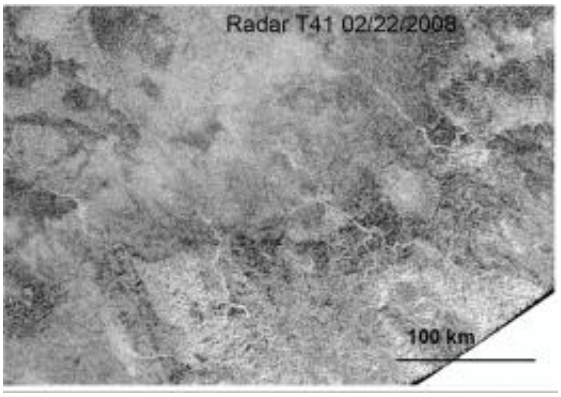


Fluvial valleys in the north polar region of Titan. Credit: Cassini Radar Team, ESA, JPL, NASA

A team of international scientists led by Mirjam Langhans, from the German Aerospace Center (DLR), will present first results of a global analysis of spatial patterns, occurrence and origin of river channels on Titan at the European Planetary Science Congress in Potsdam, Germany, on Wednesday 16 September.

To date scientists have focused their investigations on single channels due to the fact that radar and spectral data have only been captured for some narrow areas of the surface below the thick nitrogen atmosphere of this mysterious moon of Saturn. This data jigsaw puzzle is increasingly being filled in through further fly bys of Titan by NASA's Cassini spacecraft. Now, for the first time, the DLR team has developed a global perspective of the deposits of liquid hydrocarbons, such as methane and ethane, and their effected forms of erosion.

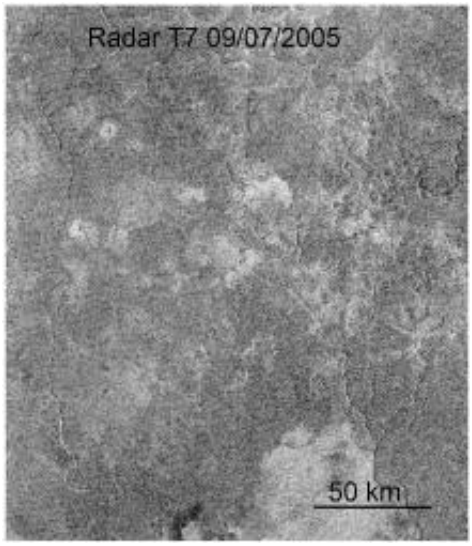
Beside the Earth, Titan is the only body in the Solar System where liquids directly have been proved to exist. The moon's exceptionally thick atmosphere, where chemical reactions occur at freezing temperatures of -179 degrees Celsius, makes this second largest moon of the Solar System of special interest for planetary science.



Canyons in the equator region of Titan (detail). Credit: Cassini Radar Team, ESA, JPL, NASA

The DLR scientists have compiled a global map of Titan, which combines all radar data and details the surface of Titan down to 300 meters in size. Furthermore, data in near infrared wavelengths have been captured for a wide band around the equator by Cassini's Visual and Infrared Mapping Spectrometer (VIMS) with a resolution of up to 300 meters per pixel.

On this equatorial band, bright continent areas and extensive dune regions can be distinguished. Dark spots on the continent areas are of special interest, because they are supposed to be fluvial deposits. Additional radar data show channels precisely linked to them, which are dry, canyon-like, and broadly distributed.



Part of the south polar region of Titan. Credit: Cassini Radar Team, ESA, JPL, NASA

Towards the north pole, the picture is much richer. There is a dense network of branching, active river systems similar to those on Earth. They are visible down to small tributaries on radar images and can be seen flowing into multiple lakes. Contrastingly, hardly any channels are found at the south pole.

“The observations of the extensive river structures at the north pole have led the team to a fascinating conclusion: there must be heavy and frequent rain of liquid hydrocarbons. Furthermore the measured channels provide first clues about the composition and relative age of different regions of Titan,” said Langhans.

Source: Europlanet