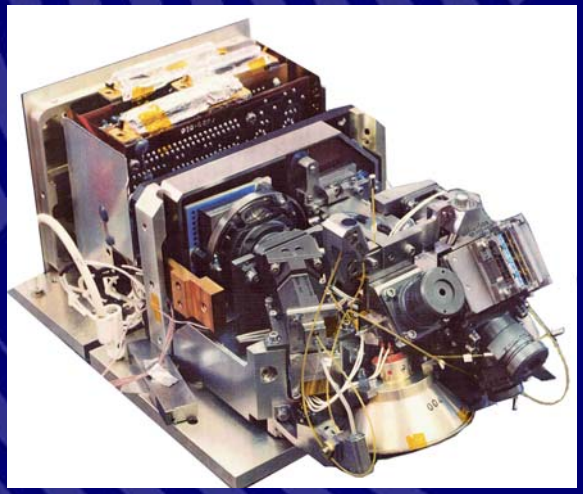
Descent Imager/ Spectral Radiometer (DISR)

Titan Encounter Results



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DISR co-investigator
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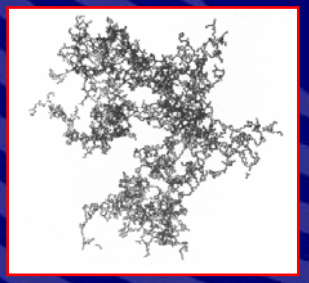
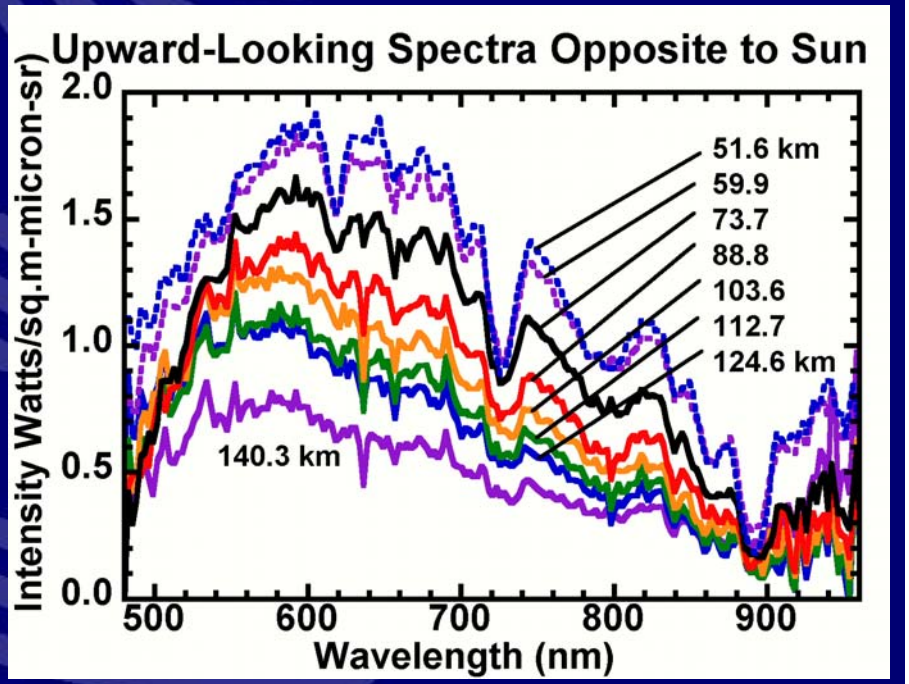
ESA Science Highlights – press conference
30 November 2005
ESA HO - Paris

Titan's Atmosphere

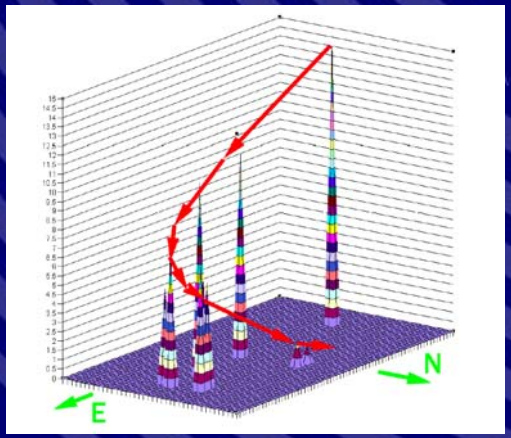
- Aerosols form a thick haze which extends from above 150 km to surface
- Particle number density increases slowly with depth
- Particles are irregular ("fractal") composed by 0.05-micron radius nuclei (monomers) and several hundreds of monomers per particle

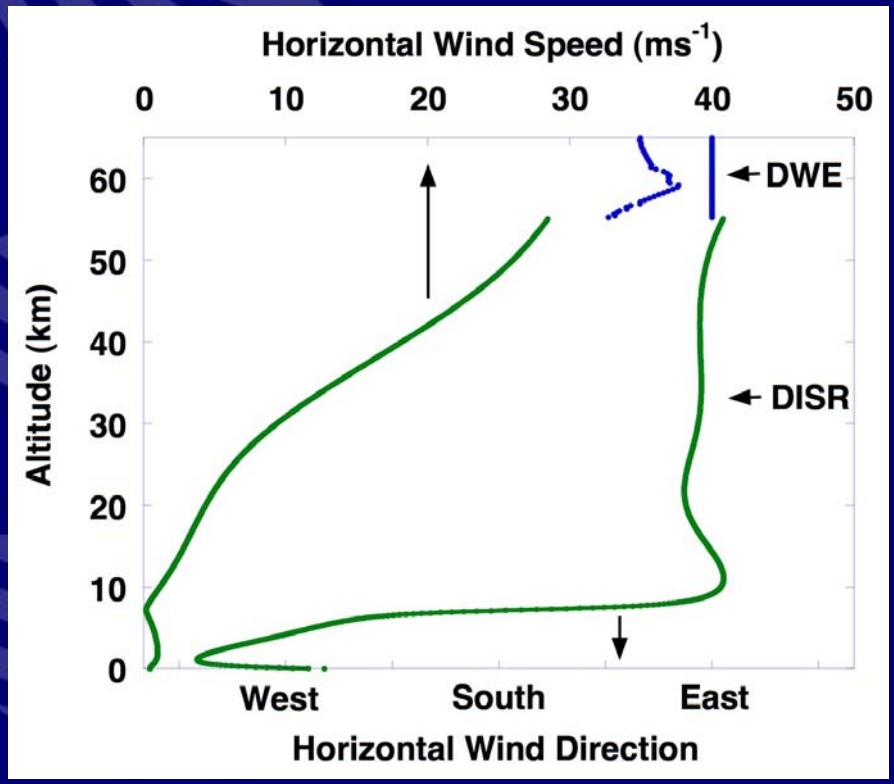




Winds aloft

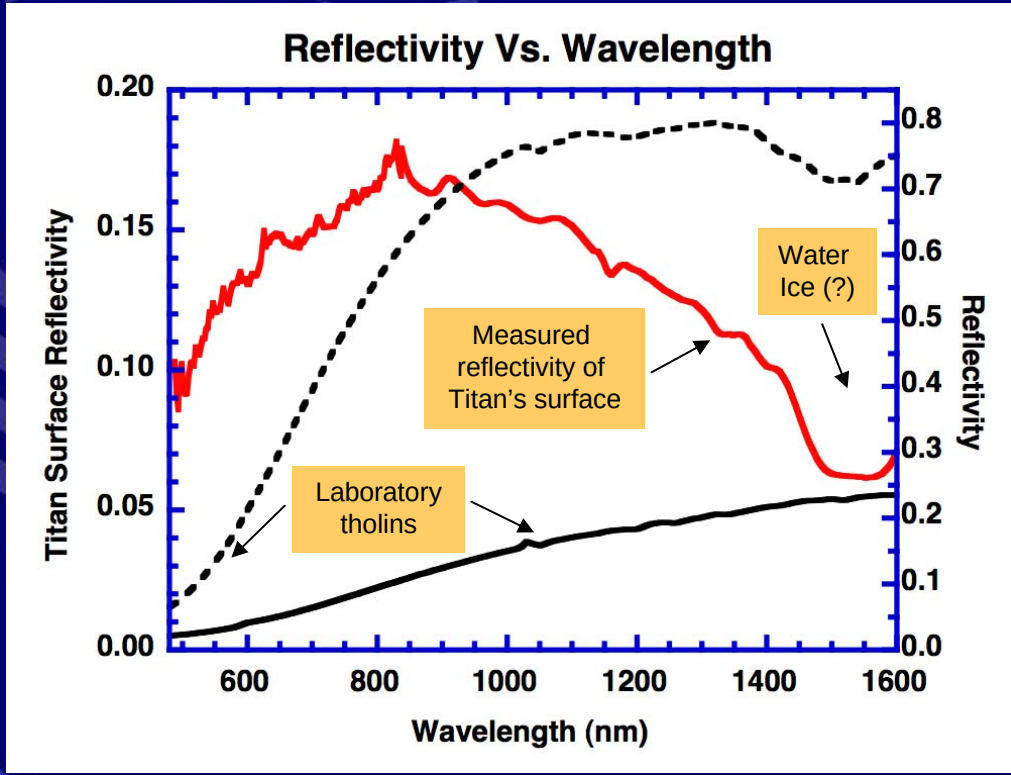
- Winds measured below 55 km
- Mostly eastward (“prograde”) motion with wind direction reversing at 7 km (top of boundary layer)
- Wind speed of 90 km/h at 50 km, less than 3 km/h at surface





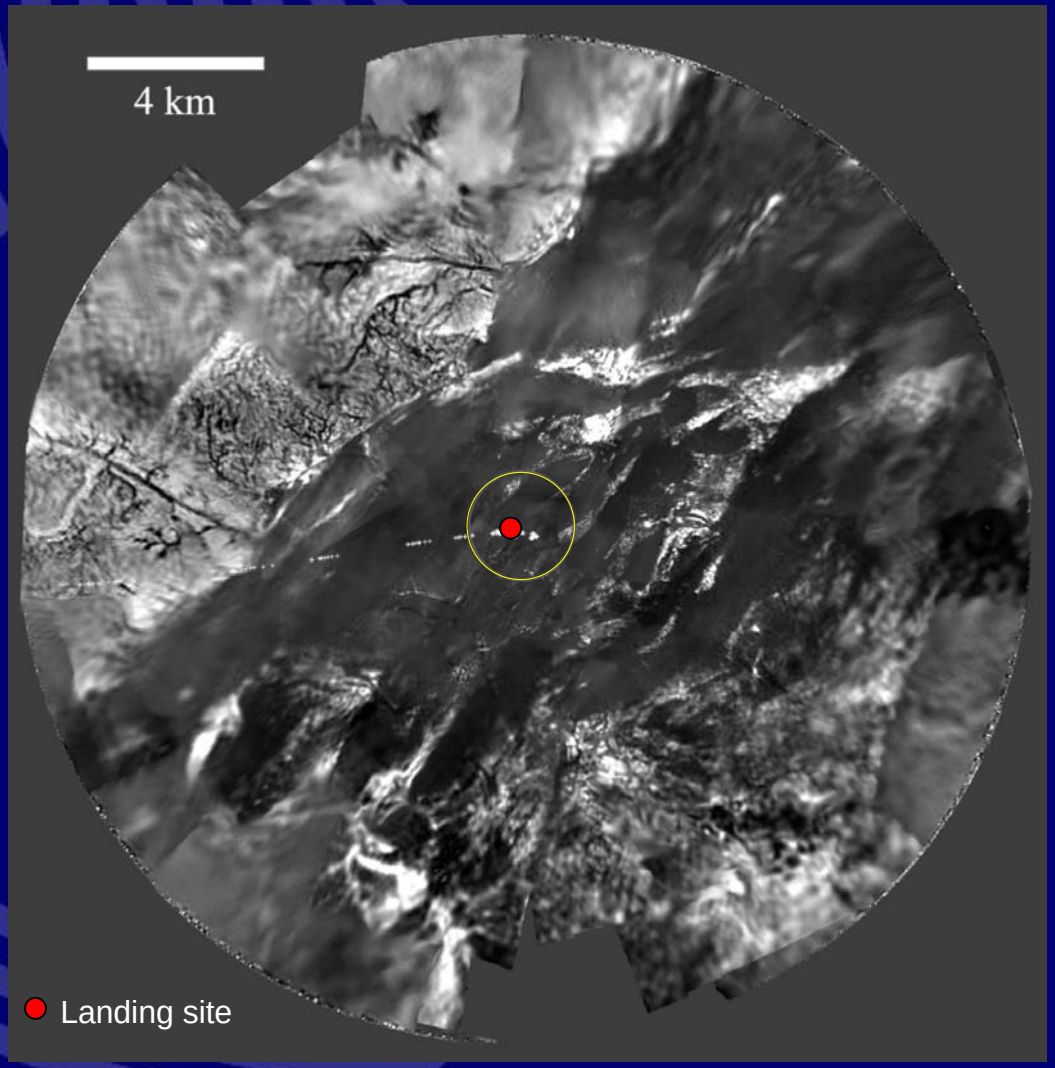
Near Titan's Surface

- Reflection spectrum of surface obtained using **onboard lamp** in last 100 m and on surface
- **Methane abundance** at 20 m is 5%
- Reflectivity of surface is low, shows absorption **probably** due **to water ice**
- Slope of the reflectivity in the infrared is **unlike any existing laboratory measurements**



Titan's Surface Observations

- Earth-like desert topography with evidence of prior fluid flow
- Brighter high terrain cut by deep channels and lower, flat, darker terrain of dry lakebed
  - Deep, narrow, branched channel system implies precipitation (likely methane rain)
  - Short, stubby channels may imply springs



Titan's Surface Observations

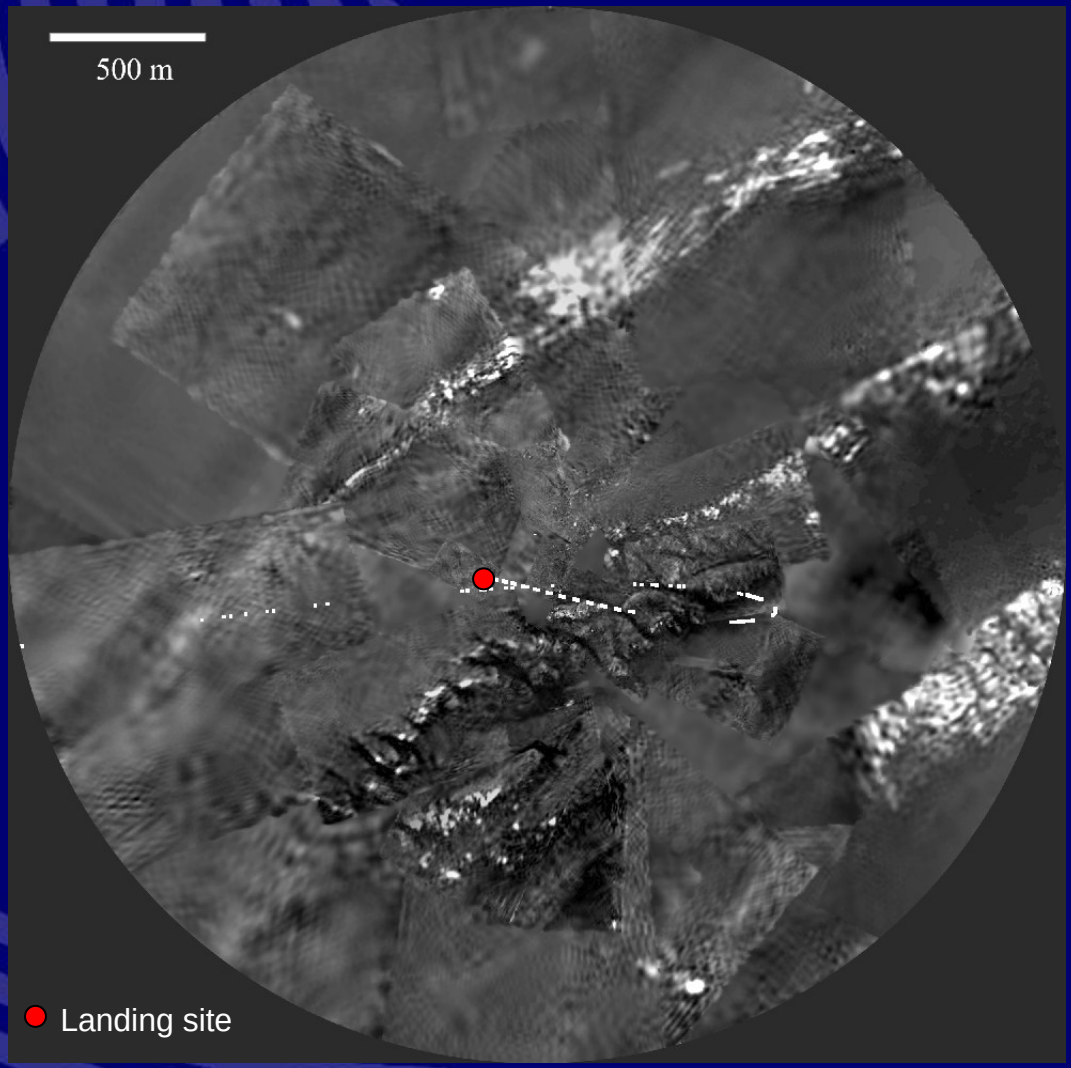
- Typical river beds are ~200m across, 100m deep with steep sides
- Slopes approaching 30°
- Suggests rapid erosion by flows

QuickTime™ et un décompresseur Cinepak sont requis pour visionner cette image.

1x3 km area

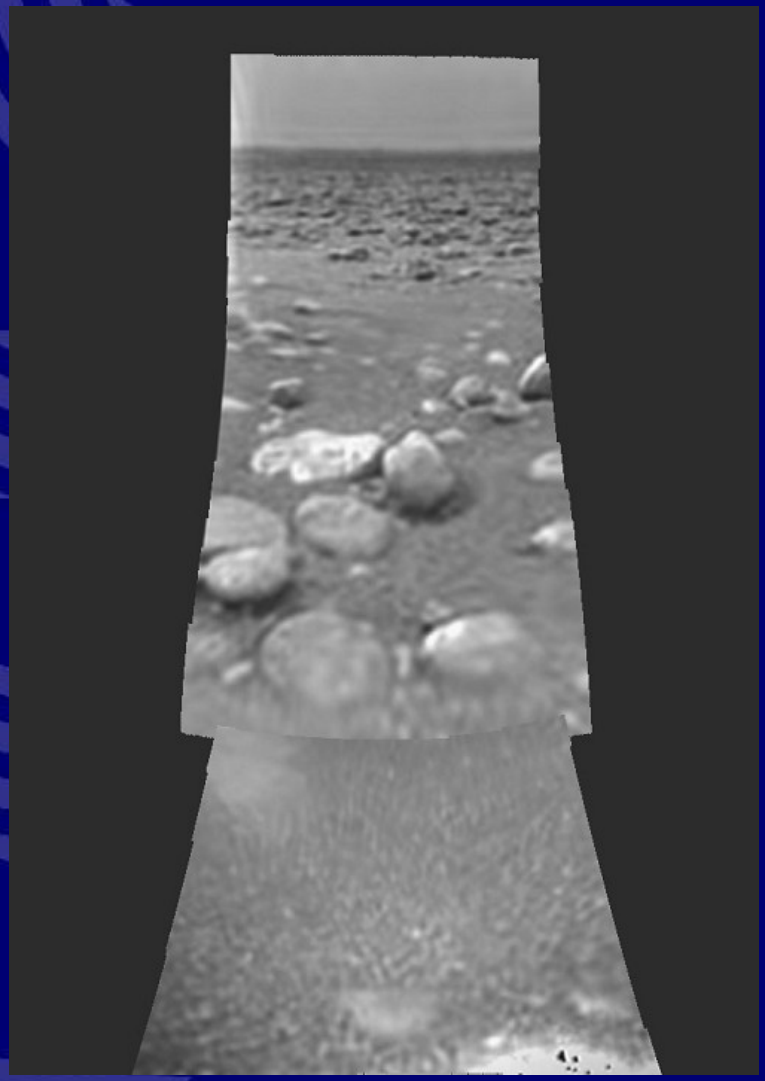
Titan's Surface Observations

- Highest resolution mosaic of the landing site (seen from 7 to 0.5 km)
- Ridge near landing site cut by a dozen dark channels
- South-easterly flow deposits or exposes brighter material (water ice?) upstream



The view from Titan's Surface

- Dry lakebed with rounded cobbles some 15 cm in diameter
- Darker fine-grained substrate ("ice gravel")
- No movement seen during more than one hour on surface (other than slight probe settling)



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The DISR team institutions

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- Laboratoire d'études spatiales et d'instrumentation en astrophysique, CNRS, Observatoire de Paris-Meudon, France
- Max-Planck Institute for Solar System Research, Katlenburg-Lindau, Germany
- Technical University of Braunschweig, Braunschweig, Germany
- US Geophysical Survey, Flagstaff AZ, USA
- Jet Propulsion Laboratory, Pasadena CA, USA
- Laboratoire de Planétologie de Grenoble, CNRS, Grenoble, France
- Centre National d'Etudes Spatiales, France