"Mars and the Giant Planets" splinter
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Objectives
- To learn about the currently available models for Mars and the Giant Planets in both line and continuum. The models should tell us the variation of the brightness temperature $T_b(nu)$ for the entire Herschel frequency range.
  - For Mars, to determine which frequency ranges are expected to be free of atmospheric lines (water, CO)? "Free" to which level? And what is the accuracy there? (Can we completely ignore the atmosphere in certain frequency ranges and just use surface models like the one from Rudy?)
  - For the Giant Planets, to determine the fidelity of the models and to find the frequency ranges free from broad spectral features.
- To assess the assumptions going into the models:
- General
  - what are the (surface) emissivities taken and how are these constrained
  - What (solid-state) features are expected in the far-IR
- Mars – what is/are:
  - the contribution from the rocky surface,
  - the influence of dust storms
  - the size and contribution of the ice caps.
  - the impact of seasonal variations on $T_b(nu)$
  - the temperature gradients on the surface of Mars and in the atmosphere. E.g. do the models simulate the large temperature inversions sometimes observed in the tropics during the Mars summers.

  Do the models need to take into account all these details or are they "negligible"?
- Giant Planets – what is/are:
  - the temperature and density structure of the atmospheres
  - the abundance profiles and opacities in lines and continuum.
  - the influence of haze
- To compare models with available FIR observations and with planned observatories. E.g. Sidher et al. (2000, Icarus, 147, 35) use **ISO-LWS** to measure T_b between 43 and 196micron, find a variability of 1.5%, and find that this compares well with predictions from a thermo physical model (Rudy et al. 1987). The availability of observations from e.g. **ASTRO-F, CIRS** etc. should be discussed
- To explore the critical uncertainties in the models and especially to assess which Herschel observations can be used to improve modelling of planetary spectra.

Other goals:
- To establish a web site with links to presentations, references to the literature and to the various models.
- To have different small working groups for each object

HIFI specific:
To have the best models available for Uranus, Mars, and Ceres. Additionally needed are models for more asteroids, Saturn and Titan.
SPIRE and PACS specific:
To have the best models available for Neptune and asteroids over the whole Herschel wavelength range.