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Laboratory Spectroscopy of Planetary Molecules

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An international team of laboratory spectroscopists are working in concert to support remote sensing of planetary atmospheres and Titan. An overview of high resolution laboratory investigations will be presented for spectral bands from the rotational wavelengths into the near infrared. The studies include measurements and theoretical analyses of the line positions, intensities and/or broadening coefficients needed to improve the spectroscopic databases required for planetary applications. The molecular studies include *water* (H_2O) broadened by carbon dioxide in the far- and mid- infrared; positions, intensities, broadening and line mixing of *carbon dioxide* (CO_2) in the near-IR; broadening and line mixing of *methane* in the mid- and near-IR; frequencies of *methyl cyanide* (CH_3CN) in the rotational region and line positions, intensities and nitrogen broadening of methyl cyanide in the low fundamental bands; global theoretical modeling of the phosphine (PH_3) parameters; and frequencies of *acetaldehyde* (CH_3CHO), *methylamine* (CH_3NH_2) and *deuterated acetylene* (HCCD, DCCD) in the rotational region.