The subtopic seeks to leverage breakthroughs in the emerging fields of nano-technology and biotechnology to
develop advanced sensors and actuators with increased sensitivity and small size for solar system exploration.
Technologies should provide enhanced capabilities over the current state-of-the-art and be able to operate in an
extreme environment. This harsh environment includes steady operation and cycling in the temperature range of
-180 degrees Centigrade to 100 degrees Centigrade, and high radiation. Of particular interest are harsh
environment-operable nanosystems for single molecule sensing and manipulation, on-chip biomolecular analysis,
and semiconductor laser diodes in the 2-5 um wavelength range, and detectors in the greater than 15 um
wavelength range.