



NASA SBIR 2009 Phase I Solicitation

X2.03 Spacecraft Environmental Monitoring and Control

Lead Center: JPL

Participating Center(s): ARC, GRC, JSC, KSC, MSFC

Monitoring technologies are employed to assure that the chemical and microbial content of the air and water environment of the astronaut crew habitat falls within acceptable limits, and that the life support system is functioning properly. The sensors may also provide data to automated control systems. All proposed technologies should have a 2 year shelf-life, including any calibration materials (liquid or gas). The technologies will need to function in low pressure environments (~8 psi) and may see unpressurized storage. Significant improvements are sought in miniaturization, accuracy, precision, and operational reliability, as well as long life, in-line operation, self-calibration, reduction of expendables, low energy consumption, and minimal operator time/maintenance for monitoring and controlling the life-support processes.

- Microbial monitoring in water
 - 2 year shelf-life; this requirement precludes the usual antibody techniques which have lifetime limitations. Sufficient precision to resolve the following: 50 CFU/ml bacteria; coliform and fungi are required to be zero per 100 ml; zero counts of parasitic protozoa
- Microbial control of surfaces, typically done by chemically treated wipes or ultraviolet
 - Microbial Controls should be recyclable w/reduced consumables
- Improved Oxygen Monitor for breathing air
 - +/- 0.05%, must operate in variable pressure 8-14.7 psia and survive exposure to vacuum
- Broad spectrum Trace Contaminant Monitor, for air, with 2 year shelf life

