BREAKOUT SESSION 7.
SENSORS, DETECTORS, AND INSTRUMENTS

Concern: Remote sensing, possible for a mixed mode sensor or a series of transmitters? Long range and close range detection?
Response: Not necessarily something that wouldn't fit into the topic area. Any type of remote sensing that would meet a science need, it would be welcome.

Concern: Spacesuits, if you put a human on Mars, given all the radiation, will they be able to use a window to look through or would they need to be so protected or use the camera to see what is in front of them?
Response: Will be protected from UV rays, but there's only so much you can do to protect from solar protons and galactic/cosmic radiation. There is some risk in this area. There should be one with the window and maybe a secondary one in case it's too bright.

Concern: Comes from academia, on the grant side, science is the drive but there's a critical science need? How much should be given to the science side as opposed to the commercial side?
Response: If it solves a problem then that helps NASA. Can also be commercialized by other agencies.

Concern: Upcoming missions, what missions are you wanting to support and what would you like to do with the data from planetary exploration. In terms of metadata, why is this important? Are you planning on using that information in the future? Bandwidth restrictions?
Response: Continuing to go back to Mars and sample return. Chemical analysis, looking for various minerals. Icy Worlds program to look at the moons of Jupitar. We think there's oceans under the ice and so we want to figure out if that's true. Remote spectrometers, geography of the surfaces. Interested in probes that can enter atmospheres for chemical sensing. Asteroids, comets. Yes, we would like to use that metadata but we do have to make the cuts. Yes, there are restrictions in bandwidth, but I think we can get within tens of kilobits. Also if you look on NASA's homepage there is also a list of NASA's future missions.

Concern: If an instrument offers better reliability at the cost of some performance?
Response: Absolutely. They can be very difficult to be reliable in space. If you have an idea for a laser that could last twice as long, but you have to give up 20% of transmutability then it would certainly be considered?

Concern: Remote sensing, considering that it's typically a payload (data links and storage), is that within the scope of the topic?
Response: The way the service measurement subtopic has worked in the past as focused more on instrument measurement and not as much on data storage. However, it is certainly or interest. Can be applicable to UAVs.

Concern: Heard about small spacecraft subsystems technology components and the remote sensing, is there a focused road map for new sensing capabilities for remote sensing on small spacecraft?
Response: NASA is looking at solutions for things like enhanced time resolution. Quantum communication and sensing is of interest to NASA but there is currently no roadmap. It's hard to make. Maybe take a look at the Science Technology page.

Concern: Any guidelines or requirements for method validation for the analytical test we are using? Sampling on a planet – any validation methods?
Response: Yes, we do have validations. Look up NASA standards for verification and validation. Many of those same engineering standards could be helpful there. Also look up SAM analysis.

Concern: Could you elaborate more on the need for better performance of passive sensors on RF? In the sub millimeter wave, how important is it to move away from cryogenics?
Response: NASA has an active sensing program. If you're looking for what we are interested in. Power retention, long term stability, lower noise figure, cryogenics sensors. As you get higher to the sub millimeter range, device can start doing full-time counting. Interested in things that can operate in both room temperature and cold. In the sub millimeter wave regime, it is always important to move away from cryogenics. It makes space hard.

Concern: Polymer materials are okay for exposure in planetary environments?
Response: It is polycarbonate right now. They have not been in flight that long, so we are unsure at this time.

Concern: Human health. Diagnostic instrument put into ISS. Is this of interest to NASA or is that more NIH?
Response: NASA is very interested in diagnostics. It is under the Human research program and SBIR has some interest in that too.

Concern: What if 750,000 and you get from TRL2 to 4 and the funds are not enough to get to TRL 6?
Response: TRL 2-4 is perfectly adequate. When we write proposals, we try to go for a TRL a year.

Concern: What area of NASA would be most focused on improving electronics reliability in general - process improvements, etc.?
Response: Very broad Concern. We want to increase reliability everywhere but nothing that sticks right out. Anything for human protection in space. Would say it's part of all subtopics.

Concern: If a company develops sensors for health, is that of interest?
Response: Yes, that would be of interest in the life since area.

Concern: In recent years there's more research coming out on how blue light affects circadian rhythms and how to improve that?
Response: Lighting is definitely an interests and could be very valuable. The ability to change the wavelength is being done.

Concern: Radiometric sensors, elaborate how to calibrate sensors on missions?
Response: Calibration is both critical and difficult. Sensors tend to be unstable. It's a critical element and is critical for all. We are always soliciting technologies to help with this and we are always looking for new ideas.