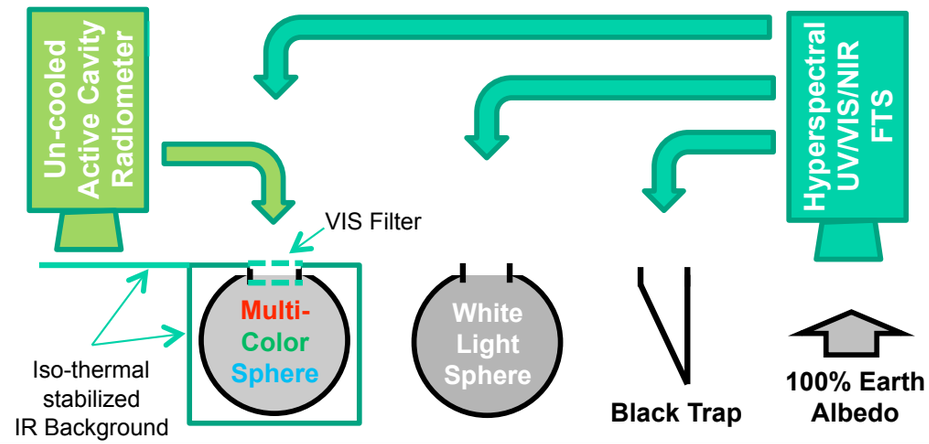
NIST in Space: Better Remote Sensors for Better Science

PI: Joseph Predina/ ITT Exelis
Co-I: Dr. Steven Lorentz, L-1 Standards & Technology

Objectives

- ✓Develop breakthrough UV/VIS/NIR remote sensor calibration concept
- ✓Improve accuracy one order-of-magnitude over current technology
- ✓International Standard (SI) traceable
- ✓Enable laboratory-type calibration accuracy in a space-based environment
- ✓Spectrally resolved over full solar range

VIS FTS & ACR Calibration Transfer



Approach:

- Combine 4 subsystems
  1. Un-cooled Active Cavity Radiometer (ACR) for 0.1% calibration of UV/VIS/NIR sources
  2. Un-cooled integrating sphere with multi-color LED sources & ultra-stable infrared background
  3. White light integrating sphere
  4. Low noise hyperspectral UV/VIS/NIR Fourier Transform Spectrometer
- SI traceable ACR & multi-color integrating sphere used to recalibrate white light source daily
- Advanced thermal control stabilizes subsystem
- FTS used as transfer standard

Key Milestones

• Project Start	9/10/12
• Define UV/VIS/NIR sources	11/30/12
• Show feasibility for 100% earth albedo radiance	1/31/13
• 0.1% un-cooled ACR feasible in space	3/1/13
• Thermal stability concept feasible	3/29/13
• System architecture for high impact mission (Earth Radiation Balance Monitor)	4/30/13
• Final Report	5/31/13

$TRL_{in} = 2$
$TRL_{out} = 3$