

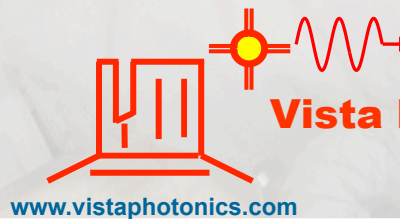
NASA's Historically Black Colleges and Universities/
Minority Serving Institutions (HBCUs/MSIs) Technology
Infusion Road Tour @ UTEP

Optical Multi-Gas Monitor Technology Demonstration on the International Space Station

Jeffrey S. Pilgrim, William R. Wood,
Miguel E. Casias, and Paul D. Mudgett



The University of Texas at El Paso



**Vista Photonics
Inc.**

www.vistaphotonics.com

April 20, 2016

Vista Photonics, Inc.

- Established 2003 in Santa Fe, NM
- Las Cruces, NM move in 2014
- 5 employees, contract R&D
- Optical detection technology
- 1st Phase One 2004, 1st Phase Two 2006

Core work with NASA

2005-2008 WMS Photoacoustic CPM (GRC SBIR)

- Telecom laser diode-based
- HF, HCL, HCN, CO
- FL Habitation 2006 conference, “too late for CEV” (Orion)
- WSTF, GRC, JSC testing

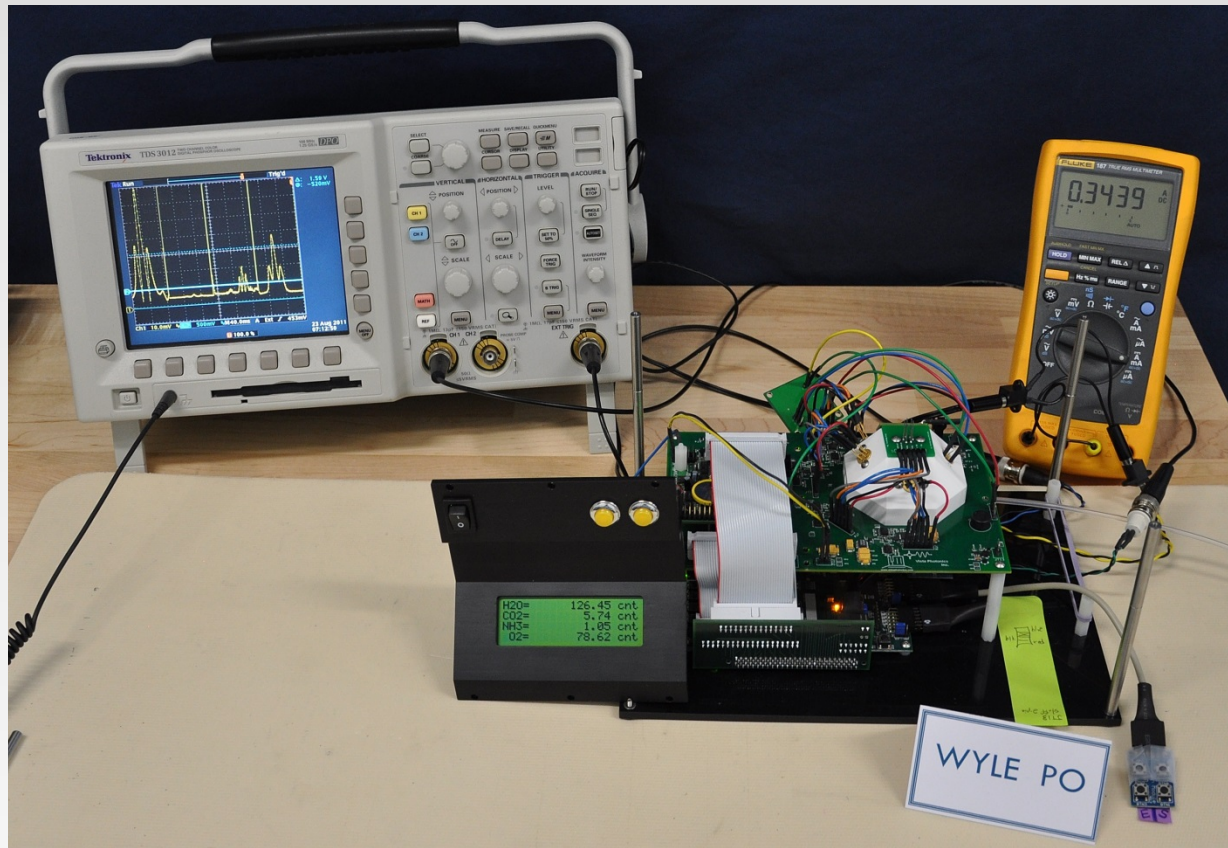
2008-2010 WMS Photodetection MCA (GRC SBIR)

- Integrating sphere enhancement
- Low-power VCSELs, derivative spectroscopy
- O₂, CO₂, H₂O
- WSTF, GRC, JSC testing

Projects fostered stakeholder relationships at JSC and GRC with Drs. Paul Mudgett, John Graf, and Gary Ruff

OLGA 2.0 in assembly

MCA=OLGA=MGM (same thing)



Phase III's

- GRC PAS CPM 2009, Gary Ruff
- JSC PAS CO 2009, John Graf
- GRC IS HF 2010, Gary Ruff
- JSC IS MCA v.1 2010, Paul Mudgett
- JSC IS MCA v.2 2011, Paul Mudgett
- JSC IS MCA v.3 2012, Paul Mudgett
- JSC IS ½ CPM 2012, Paul Mudgett
- JSC IS MGM 2013, tech demo on ISS, Paul Mudgett
- JSC/GRC IS CPM v.1 2014, Paul Mudgett & Gary Ruff
- GRC/JSC/NESC/SBIR-CRP IS CPM(+) v.2 2015, Paul Mudgett, Gary Ruff & John Graf
- JSC IS NH3 contingency 2016, John Graf

OLGA 3.0 before delivery

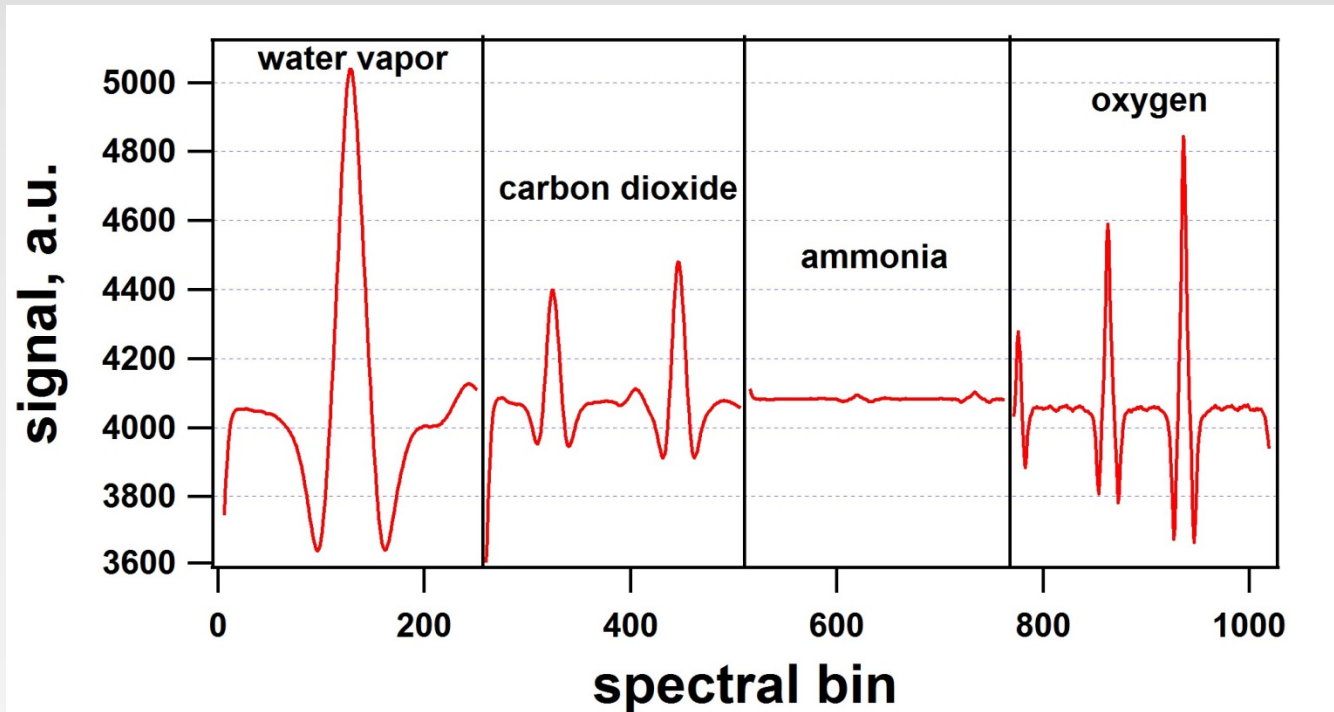
Enclosure by Wyle Integrated Science and Engineering Group



Four channel spectral data

First Phase 3 added NH3 to MCA platform

4 gases at 5 Hz



Progressive OLGAs versions

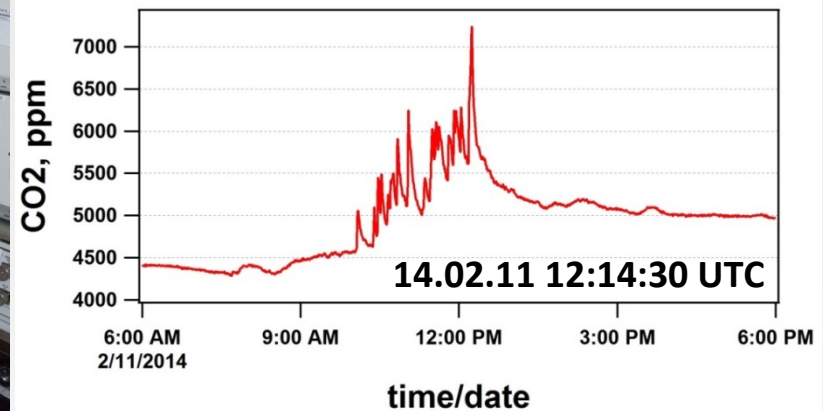


Multi-Gas Monitor



Multi-Gas Monitor on ISS

Launched November 2013 on Soyuz
SPHERES-RINGS unexpected
challenge



MGM follow on efforts

2016 single channel nh3 sensor

- MGM tech demo stimulated project
- Contingency NH3 monitor (flight critical)
- Commercial crew urgency
- WSTF & JSC testing imminent

2016 CPM (+), 6 gas SAFFIRE (Orbital Cygnus)

- JSC and GRC testing in July

2016 U.S. Navy submarine trials

- MGM copy
- Interest in CPM (+)

Summary

- MGM selected for 2015 JSC Center Director's Team Award
- Technical development resulted in multiple NASA Tech Briefs
- Don't let competitors talk you out of competing
- Find advocates and stakeholders inside NASA, generate follow-on business
- Be responsive and do what you say you'll do