Smoke Aerosol Measurement Experiment (SAME)

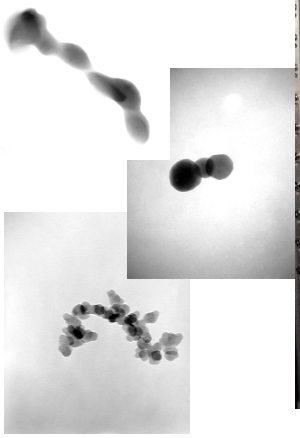
PI: Dr. David Urban, NASA GRC
PS: Dr. Gary Ruff, NASA GRC
PM: William Sheredy, NASA GRC
Engineering Team: ZIN Tech., Inc.

Co-I: Dr. Zeng-Guang Yuan, NCMR
Co-I: Dr. George Mulholland, U. of Maryland
Co-I: Dr. Jiann Yang, NIST
Co-I: Dr. Thomas Cleary, NIST

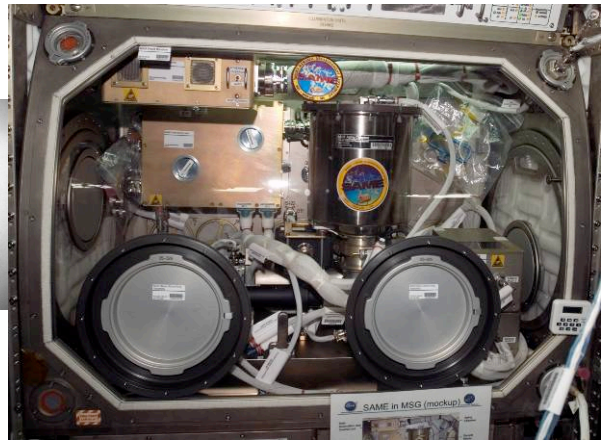
Glenn Research Center

Objective:

- Quantify particulate fire signatures in microgravity by measuring moments of smoke particulate size distribution from typical spacecraft materials in microgravity.
- Evaluate the performance of the two existing U.S. spacecraft smoke detector designs in microgravity.
- Evaluate advanced fire detection sensors (e.g. species-specific sensors and E-Nose).



Images of microgravity particulate from overheated Teflon & Kapton & candle soot.



SAME in the MSG

Relevance/Impact:

- SAME will provide data required for the rational development of fire particulate detectors on exploration vehicles and habitats.

Development Approach:

- SAME will rely on the DAFT experiment to prove the µg performance of the P-Trak, a key diagnostic.
- The project team is pursuing a protoflight development approach.
- After initial setup by the crew, the experiment will utilize uplinked parameters for autonomous operations. Consumables will be periodically changed out by the crew.

ISS Resource Requirements

Accommodation (carrier)	Microgravity Science Glovebox
Upmass (kg) (w/o packing factor)	52
Volume (m^3) (w/o packing factor)	0.15
Power (kw) (peak)	0.230
Crew Time (hrs) (installation/operations)	14
Autonomous Ops Time (hrs)	60
Launch/Increment	13A.1/Increment 15

Project Life Cycle Schedule

Milestones	RDR	IERRR	PDR/CDR	Safety	VRR	PSR	FHA	Launch	Ops	Return	Final Report
Actual/ Baseline	4/04	1/05	2/06	4/06	8/06	2/07	2/07	8/07	9-10/07	6/08	6/09