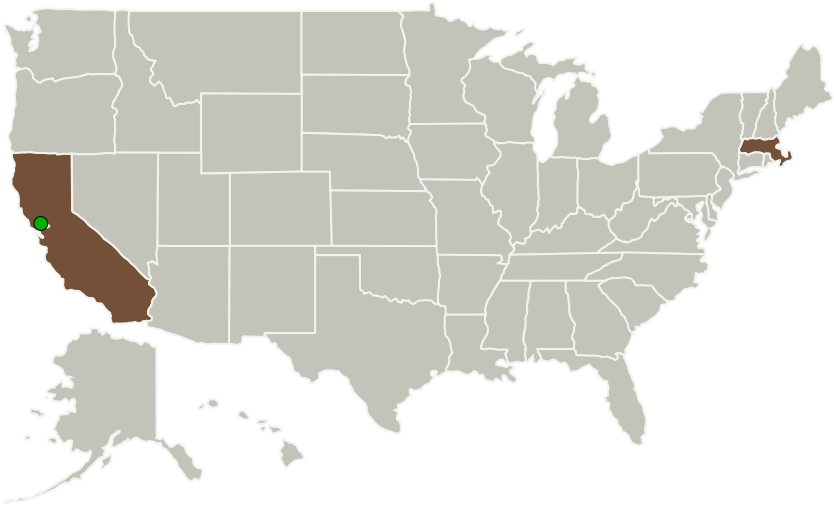
Miniaturization of Airborne Integrated Cavity Output Spectroscopy Instrument, Phase I

Completed Technology Project (2014 - 2014)

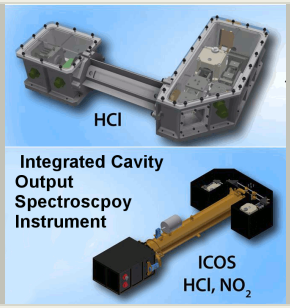
Project Introduction

New measurement technologies are required to support science campaigns to better quantify rapid changes in the Earth atmosphere system. A key factor in this heightened focus on risk and uncertainty is the growing recognition that the climate is changing far more rapidly than was thought just five years ago. Aurora Flight Sciences and Harvard University propose to miniaturize the Harvard Integrated Cavity Output Spectroscopy (ICOS) instrument for use in the unique reel-down payload pod of the "StratoCruiser", a proposed propulsive high-altitude balloon gondola. Combining the persistence of balloon platforms, the vertical measurements of soundings, and the mobility of aircraft the StratoCruiser will enable new understanding of stratospheric phenomenon. The focus of the proposed effort will be to enhance the StratoCruiser reel-down payload capability through size, weight, and/or power (SWaP) reduction in the dual laser, 50 cm cell, ICOS instrument. The soundings from the StratoCruiser ICOS-based observing system provide laboratory quality, in situ detection of radicals, isotopes, ozone, reactive intermediates, long-lived tracers and condensed and vapor phase H2O and HDO over the US for a period of 4-6 weeks.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California



Miniaturization of Airborne Integrated Cavity Output Spectroscopy Instrument Project Image

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Primary U.S. Work Locations	
California	Massachusetts

Project Transitions

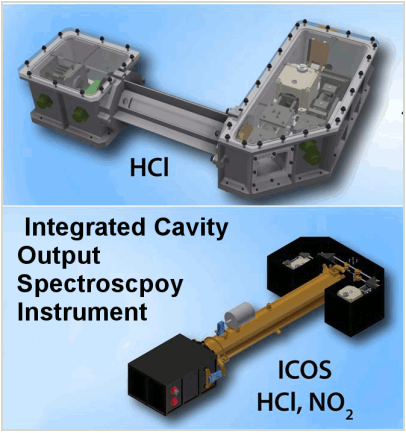
June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137669)*

Images



Project Image
Miniaturization of Airborne Integrated Cavity Output Spectroscopy Instrument Project Image
(https://techport.nasa.gov/image/137283)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

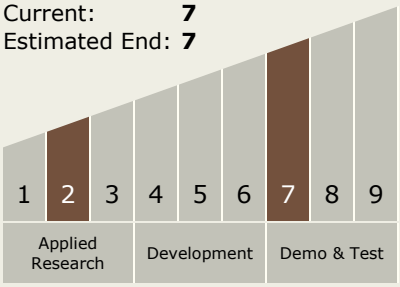
Carlos Torrez

Principal Investigator:

Justin Mcclellan

Technology Maturity (TRL)

Start: **2**
Current: **7**
Estimated End: **7**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  └ TX08.3 In-Situ Instruments and Sensors
    └ TX08.3.4 Environment Sensors

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System