

Summary of Operational Instruments

NASA Instruments - Operational	PI/Co-J/PM	Type of Instrument	Objective/ Description	Airborne Platforms	Status	Funding Sources	Decadal Survey Tier
ACR (Airborne Cloud Radar) aka CVR (CloudSat Validation Radar)	PI: Vane, Deb (transferred for Cloudsat few years ago) PI (historical): Durden, Steve 43708 PM: Dinardo, Steve	Radar	Airborne Cloud Radar (ACR) is a 94-GHz (W-band) vertical pointing Doppler cloud profiling radar that directly measures the absorption of solar radiation by clouds.	DC-8, P-3, Kings aircraft	* Flown for Several science flight experiments, including: 2003 (EOS AMSR-E Wakasa Bay, P-3); 2006 (CloudSat Underflight Experiment, Kings) * Currently used as ground-based radar for CloudSat * Currently in trailer behind bldg 169, (2/12)	Cloudsat	
AirMSPI (Air Multiangle SpectroPolarimetric Imager)	PI: Diner, Dave 4-6319	Camera	AirMSPI is a spectropolarimetric camera that uses moderately high resolution imagery at nine view angles, in four bands ranging from the infrared to the ultraviolet to measure aerosol and cloud microphysical properties.	ER-2	* Under development, funded by AITT * On schedule for instrument delivery at end of 2009	ROSES AITT funding FY08:\$454K, FY09: \$400K FY10: \$150	2-ACE
ALIAS (Aircraft Laser Infrared Absorption Spectrometer)	PI: Christensen, Lance PI (historical): Chris Webster	Spectrometer	High resolution scanning TDL spectrometer designed to make direct simultaneous measurements of HCL, NO ₂ , HNO ₃ , CH ₄ and N ₂ O in the polar stratosphere at sensitivities of tens of parts per 10 ¹² .	WB-57 or ER-2	* More than 30 flights 8/1990-present * Funded for FY09-12. Anticipate that it will fly during NASA TC4 mission in 2011.	NASA Upper Atmospheric Research Program	1-CLARREO,2-ACE,2-GEO-CAPE,3-GACM
APR-2 (Dual Frequency Airborne Precipitation Radar)	PI: Tanelli, Simone	Radar	Airborne dual-frequency (13.4/35.6-GHz) precipitation radar simultaneously measures vertical profiles of rainfall/cloud reflectivities, drop size distribution, fall velocity, and linear depolarization ratios.	DC8 and P-3	* Flown in 4 flight campaigns - 2001 (CAMEX-4, DC-8); 2003 (EOS AMSR-E Wakasa Bay, P-3); 2006 (NAMMA, DC 8); 2007 (TC-4, DC-8), with 2010 planned	Proposals to NASA NRAs on these science field experiments.	2-ACE
AVIRIS-C (Airborne Visible InfraRed Imaging Spectrometer - Classic)	PI: Green, Rob 49136	Spectrometer	AVIRIS measures upwelling spectral radiance in 224 contiguous spectral channels/bands with wavelengths from 400 to 2500 nanometers. Data is used for a variety of applications/analysis.	ER-2, Twin-Otter and WB-57	* Flown '87-Present * Flown extensively in 2008 in support of HypsIRI-PPFT and other science research experiments * Next scheduled flight March 2009.	FY08 funding: \$1850K	2-HypsIRI, 3-SCLP
AVIRIS-NG (Airborne Visible InfraRed Imaging Spectrometer - Next Generation)	PI: Green, Rob	Spectrometer	AVIRIS-NG measures upwelling spectral radiance in 426 contiguous spectral channels/bands with wavelengths from 380 to 2510 nanometers. Data is used for a variety of applications/analysis.	twin-otter, ER-2	*In development		
CILS (Carbon Isotope Laser Spectrometer) (surveyed formerly ALIS)	PI: Christensen, Lance	Spectrometer	Compact spectrometer that measures 13C/12C in CO ₂ and CH ₄ to sub-per mil sensitivity for fieldwork.	Twin otter, UAV, DC-8, West balloon	* Just finished development. Has successfully acquired data.		
CO2LAS (Laser Absorption Spectrometer)	PI: Spiers, Gary 4-7831	Spectrometer	Measures atmospheric CO ₂ to a precision of 1-2 ppm in the lower troposphere.	twin otter, planned for DC-8	* Currently under consideration for Ascends decadal survey mission. *Currently under development, has performed engineering flights	AITT funding: FY08: \$148K, FY09: \$118K	2-ASCENDS
HAMS R (High Altitude MMIC Sounding Radiometer)	PI: Lambrigtsen, Bjorn 4-8932	Radiometer	Microwave atmospheric sounder for the 3-D distribution of temperature, water vapor, and liquid water in the atmosphere.	ER2 or DC8 or Global Hawk UAV	* 3 flight campaigns - 2001 (CAMEX-4, ER-2), 2005 (TCSP, ER-2), 2006 (NAMMA, DC-8) * Expect to fly in 2010 field campaign	AITT proposal funded to reconfigure HAMS R for Ikhana/Global Hawk UAVs; FY08:\$483K, FY09: \$316K b) expect to respond to likely '09 NRA for hurricane field campaign in 2010. Testbed for PATH/GeoSTAR	3-PATH
JLH (JPL Laser Hygrometer)	PI: Herman, Bob 3-4720 PM: Troy, Rob	Hygrometer	Diode laser hygrometer measures the water vapor volume mixing ratio (0.1 to 1000 ppmv) in the upper troposphere and lower stratosphere along the aircraft path for both level flight and spirals.	WB-57, ER-2 aircraft	* Newly Operating and Validated Instruments Comparison Experiment (NOVICE) in 2008 * Considering validation for NPP/NPOESS in 2009, UAV mission in 2009, UAS-AVE in 2009, Guam in 2011	Atmospheric Composition Focus (FY09-FY12)	1-CLARREO, DESDyml, 3-PATH, GACM, SCLP
JLH shortpath	PI: Herman, Bob	Hygrometer	Diode laser hygrometer has a different optical configuration from the basic JLH, measures the water vapor volume mixing ratio (10 to 20000 ppmv) in the troposphere and lowermost stratosphere along the aircraft path for both level flight and spirals.	DC-8 aircraft	* Ready to fly	No identified future funding.	1-CLARREO, DESDyml, 3-PATH, GACM, SCLP
Mark IV	PI: Toon, Geoff 4-8259	Trace Gas	Measures many trace gases.	High altitude research balloons, NASA DC-8 aircraft	* Flown 22 times on high altitude research balloons (1989 to present). * Performed 3 campaigns (40+ flights) on the NASA DC-8 aircraft (1987, 1989, 1992) * Performing balloon flights on an approximately annual basis.	FY08: \$450k from NASA's Upper Atmosphere Research Program	
MASTER (MODIS/ASTER simulator) (Moderate Resolution Imaging Spectroradiometer/Advanced Spaceborne Thermal Emission Reflectance Radiometer)	PI: Hook, Simon 4-0974	Airborne Simulator	MASTER has 50 spectral channels located between 0.4 and 13 pm. MASTER consists of three main components: the recorder/digitizer, the spectrometer and the scan head.	Beechcraft, Caravan, ER-2, WB-57	* Several monthly campaigns per year starting 1998.	Sponsored by EOS ASTER project office	2-HypsIRI
MTP (Microwave Temperature Profiler)	PI: Mahoney, Michael 4-5584	Temperature Profiler	Measures microwave temperature profile above, at and below flight level which is used to construct temperature curtain and isentropes surfaces along the flight track.	DC-8, ER-2, WB-57, Geophysica, Gulfstream V (HIAPER), Global Hawk	* 49 field campaigns * Still in operation with a half dozen future campaigns already planned	NASA UARP and RSP for TC4 data analysis, NASA UARP and RSP for TC4 and other data analysis and Global Hawk integration and GloPac flights. NSF/UCAR for completion of HIAPER START-08 and HIPPO data analysis NASA TCP for ARCTAS if selected NSF/UCAR for completion of HIAPER MTP construction and training	
PALS (Passive Active L- and S-Band)	PI: Yueh, Simon 43012 PM: Dinardo, Steve 44212	Radiometer	L-band microwave radiometer and radar measures soil moisture and sea surface salinity (0.2 psu over open ocean).	Twin Otter, C-130, P-3	2008 slow motion campaign; 2009 high wind campaign Feb/Mar	AITT, SMAP, NASA RTOP	1-SMAP, 3-PATH
POLSCAT (Polarimetric Scatterometer)	PI: Yueh, Simon	Scatterometer	Polarimetric scatterometer ku-band microwave radar evaluates terrestrial snow cover and ocean surface winds.	NCAR C-130, Twin Otter, P-3	* Past experiments completed in 2002, 2003, 2006, 2007, 2008 and 2009 * More flights planned for later this year as well as anticipated for spring 2010	RTOP	3-SCLP
PRISM (Portable Remote Imaging SpectroMeter)	PI: Mouroulis, Pantazis (Zakos)	Spectrometer	UV-NIR (350 nm to 1050 nm) Coastal Ocean Science Instrument	DHC-6 Twin Otter, UAV	Operational NASA facility instrument		
UAVSAR L-Band (Unmanned Aircraft Vehicle Synthetic Aperture Radar)	PI: Hensley, Scott 4-3322 PM: Lou, Yunling 4-2647	Radar	Polarimetric L-band synthetic aperture radar (SAR) takes differential interferometric measurements for measuring surface deformation (earthquakes, volcanoes ice topography) and other dynamically changing phenomena.	Gulfstream III (C-20)	Operational; 20+ FRs/year	Currently funded by ESTO. Seeking additional funding from Jack Kaye	1-DESDyml, 3-SCLP

UAVSAR P-Band Unmanned Aircraft Vehicle Synthetic Aperture Radar)	Moghaddam, Mahta (USC) PM: Lou, Yunling 4-2647	Radar	The NASA/JPL UAVSAR is a pod-based repeat-pass polarimetric SAR that currently operates in L-band (1.2 Ghz). The AirMOSS radar replaces the L-band front-end electronics and antenna with components that operate at P-band. AirMOSS utilizes a passive dual-polarized array antenna based on the GeoSAR P-band antenna design to take advantage of the good polarization isolation over the bandwidth of 280 to 440 MHz.	Gulfstream III (JSC)	Operational	AirMOSS EV-1	
ULH (Unmanned Aerial System Laser Hygrometer)	PI: Herman, Bob	Diode laser hygrometer	ULH has upgraded electronics and realtime capability compared to JLH/JLH shortpath. Instrument measures the water vapor volume mixing ratio (0.1 to 1000 ppmv) in the stratosphere along the aircraft path.	WB-57, ER-2, Global Hawk	* Newly Operating and Validated Instruments Comparison Experiment (NOVICE) in 2008 * GloPac Global Hawk campaign scheduled for summer 2009.	Atmospheric Composition Focus (FY09-FY12)	1-CLARREO.D ESDyntl,3- PATH,GACM, SCLP
WISE (Wide-field Infrared Survey Explorer)	PI: Rignot, Eric 4-1640	Radar	High Frequency (2-20 MHz) Radar Sounder measures ice thickness especially over warm ice where other high frequency systems can not penetrate to make this measurement.	Single Otter and Piper Seneca aircraft	* Two one week deployments in 2006: Glaciers in Alaska and northern and southern ice-fields in Patagonia. Again in Greenland in 2008 ~ 10 days, 2008 Alaska a wee. 2009 also Greenland 10 days. Future plans for Greenland, and Alaska in 2010.	IPY (\$600K over 3 years) and PIDDP (Safaeinli 3 years but this is only for rad hard transmitter and radar development. We will use the radar as a testbed to test new hardware performance)	1-DESDyntl, 3 SCLP