CIRPAS

The Center for Interdisciplinary Remotely-Piloted Aircraft Studies (CIRPAS) was established at the Naval Postgraduate School in Monterey, California by the Office of Naval Research in the Spring of 1996 to provide Manned and Unmanned Air Vehicle flight services to the scientific and engineering communities.

CIRPAS became an University National Oceanographic Laboratory System (UNOLS) National Facility on 27 September 2002

THE AIRCRAFT FLEET

UV 18-A Twin Otter

Pelican (2)

Predator (3)

FACILITIES:

- **Marina Facility**

  3500 ft runway - manned operations only

  30,000 sq ft maintenance hangar

  Instrumentation and Calibration Laboratory

  Maintenance and Payload integration shops

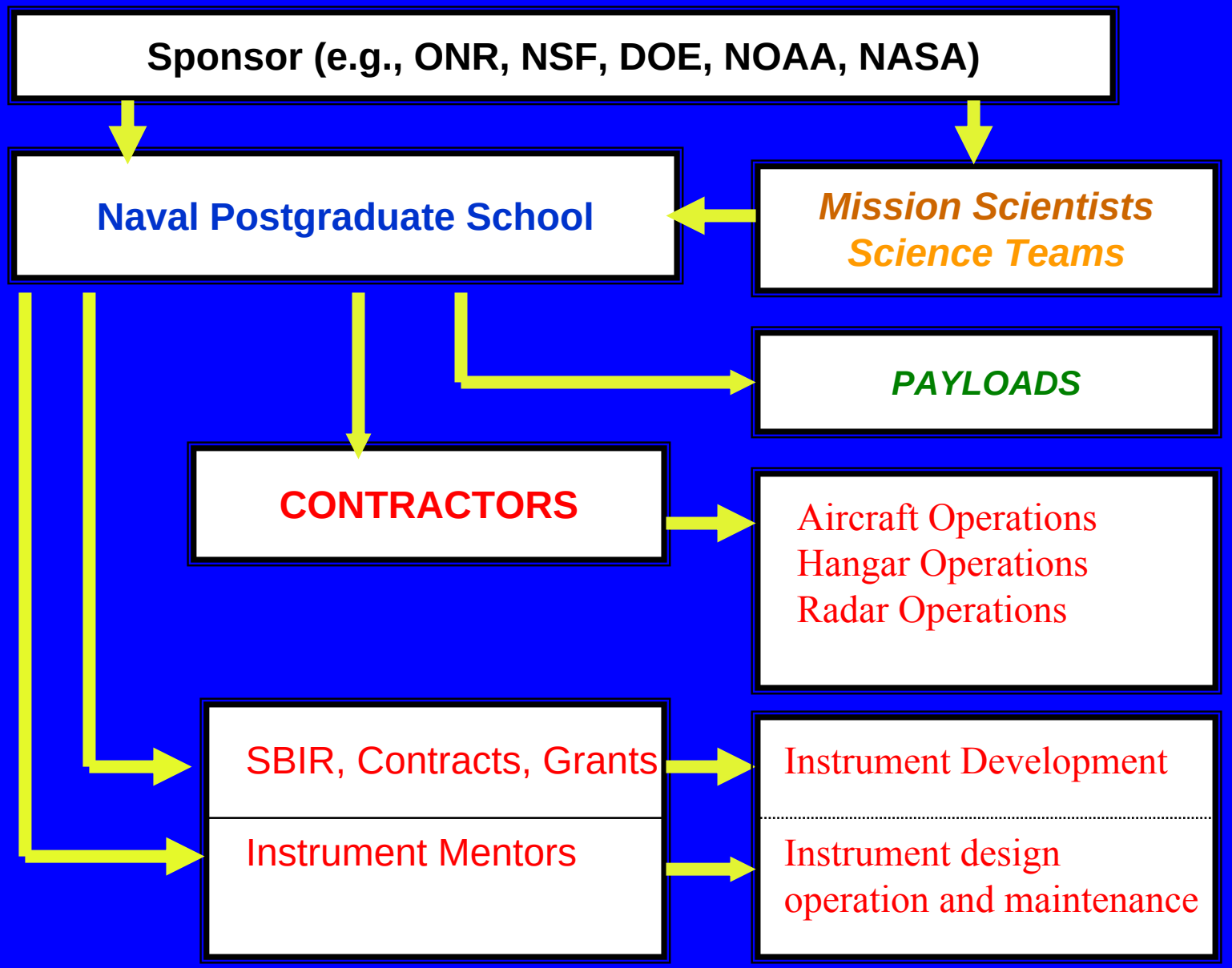
  Offices

GROUND BASED ASSETS

MWR-05X Mobile Storm Radar

Mobile Wind LIDAR

CIRPAS OPERATIONS DIAGRAM



CIRPAS CUSTOMERS AND SERVICE

Individual Scientists or Science Teams:

CIRPAS may provide aircraft and any or all its "facility instruments" or "research instruments". Also, may integrate customer's own instrument into the payload.

Use of CIRPAS "research instruments" requires mentor support.

Research Aircraft: Twin Otter

- Research Capacity: 1500 lbs
- Research Power: 5600 W at 28 VDC, 4000W 110VAC 60 hz:
- Speed: 100-140 Kts
- Practical Ceiling: 18000 ft.

Twin Otter: Facility Payload

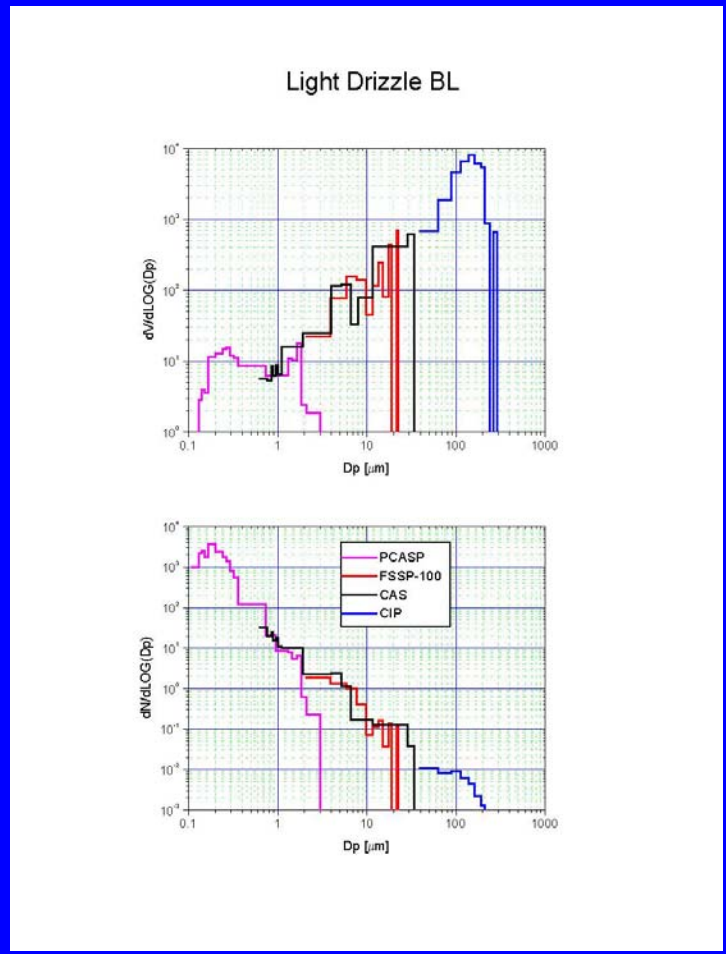
- **Nose:**
  - Temperature
  - Dew Point
  - Pressure
    - Static
    - Dynamic
    - Sideslip
    - Attack angle
  - GPS/INS
  - IR Temperature
  - Liquid Water Content
  - Aerosol Inlet

Twin Otter: Facility Payload

Wings: CAPS, FSSP, PCASP, CIP, PIP, APS

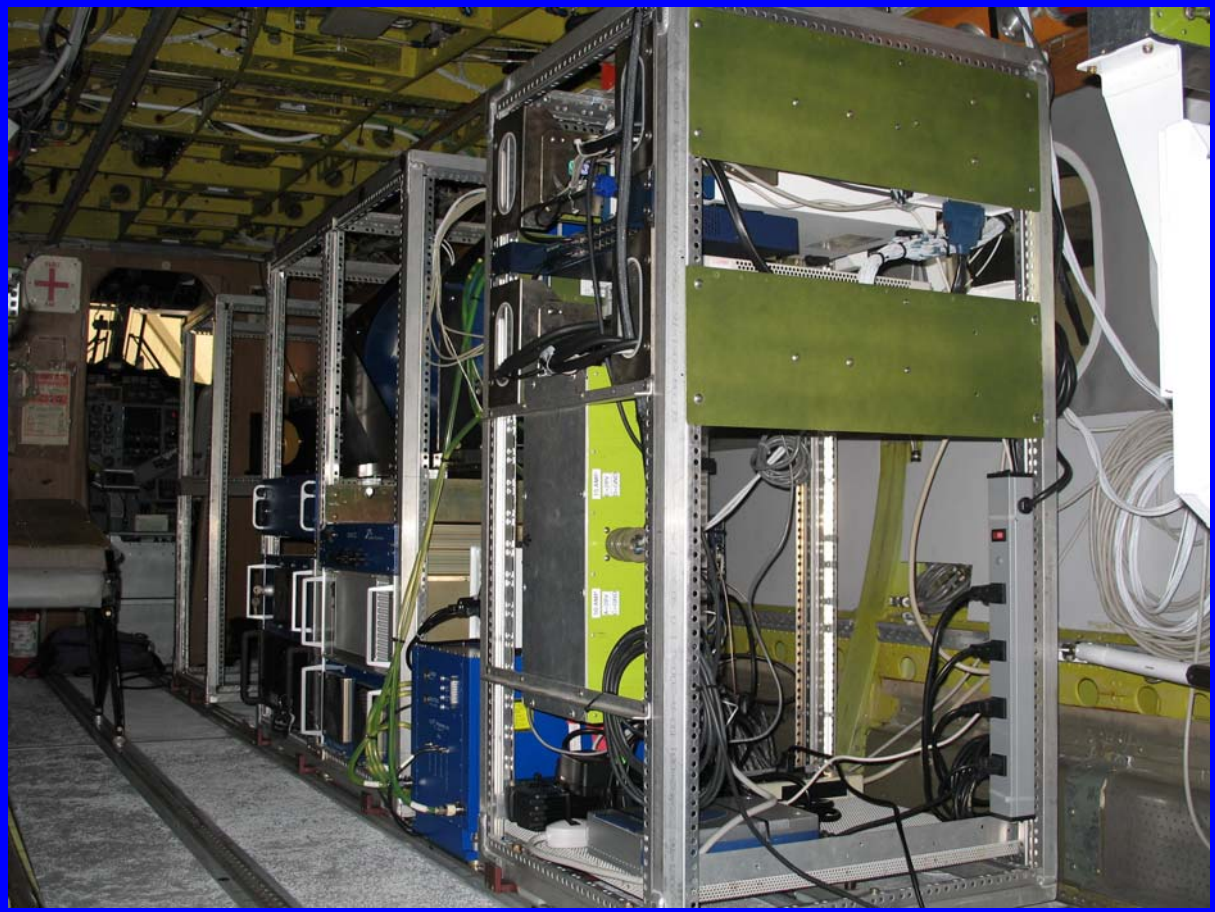
Hard points and pods for 'research' or 'guest' instruments

Aerosol and Cloud Spectrometers



Twin Otter: Facility Payload

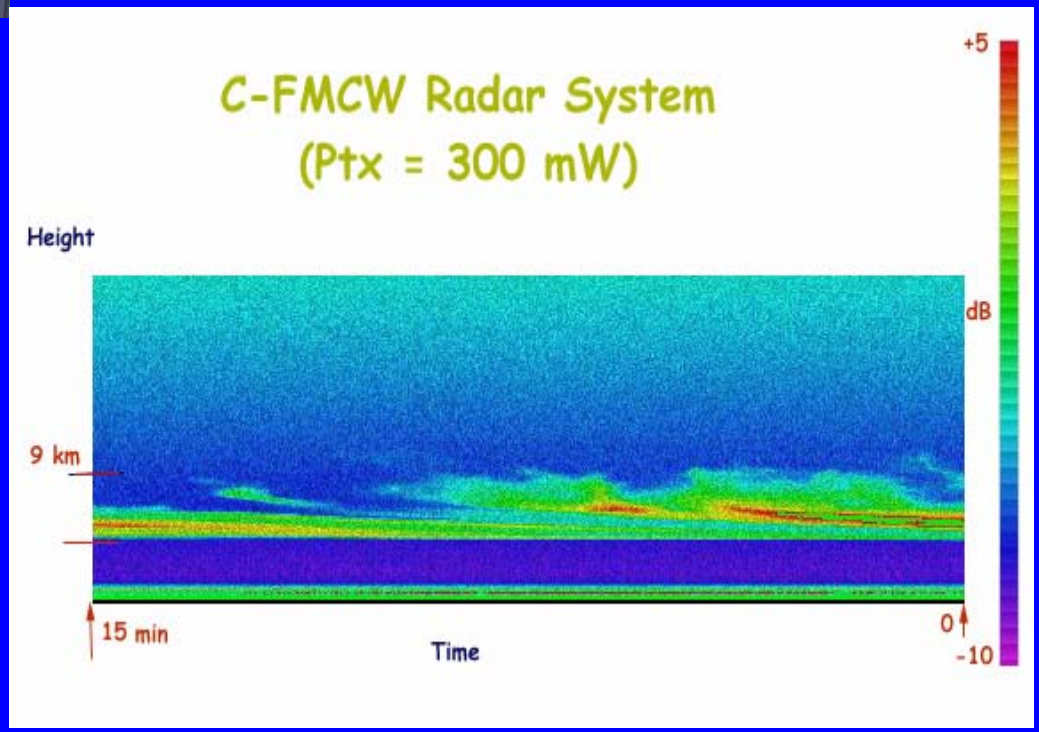
Cabin: Nephelometer, Sootphotometer, CPCs, UFCPC, Data System
Racks for 'Research' and 'Guest' Instruments.



CIRPAS Research Instruments and their mentors

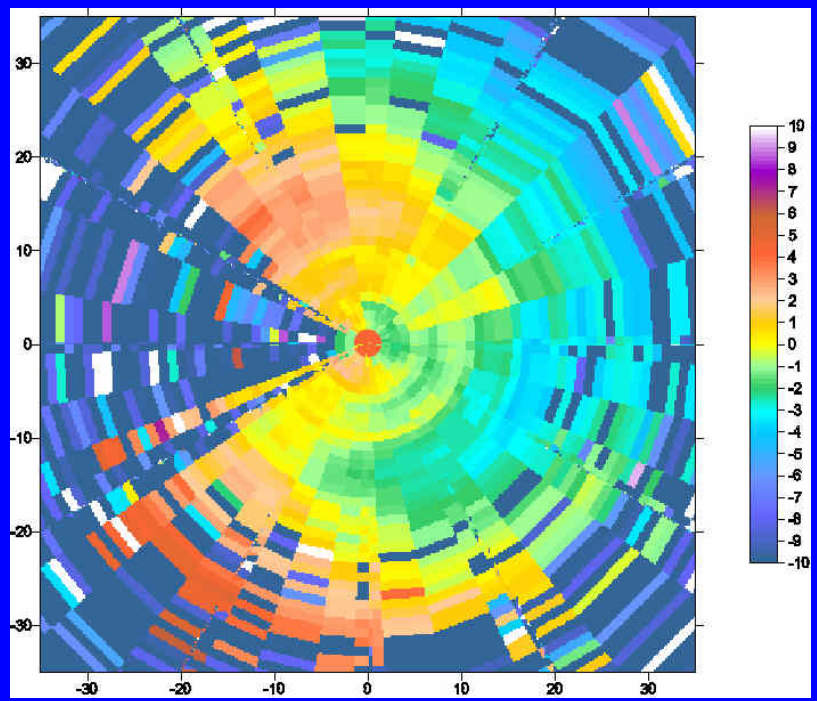
Instrument	Mentor
•Cloud radar (95 Ghz):	Bruce Albrecht, U. of Miami
•Turbulence and Fluxes:	Carl Friehe, UC Irvine
•Wind Lidar:	Dave Emmett, Simpson Weather Associates
•Phased Doppler Drop Spectrometer:	Patrick Chuang, UC Santa Cruz
•Aerosol Mass Spectrometer:	John Seinfeld, Caltech
•Counterflow Virtual Impactor:	John Seinfeld, Caltech
•Twin DMAS	Rich Flagan, Caltech
•PILS	John Seinfeld, Caltech
•CCN	John Seinfeld, Caltech

CIRPAS Research Instrument Example (Cloud Radar: Albrecht)

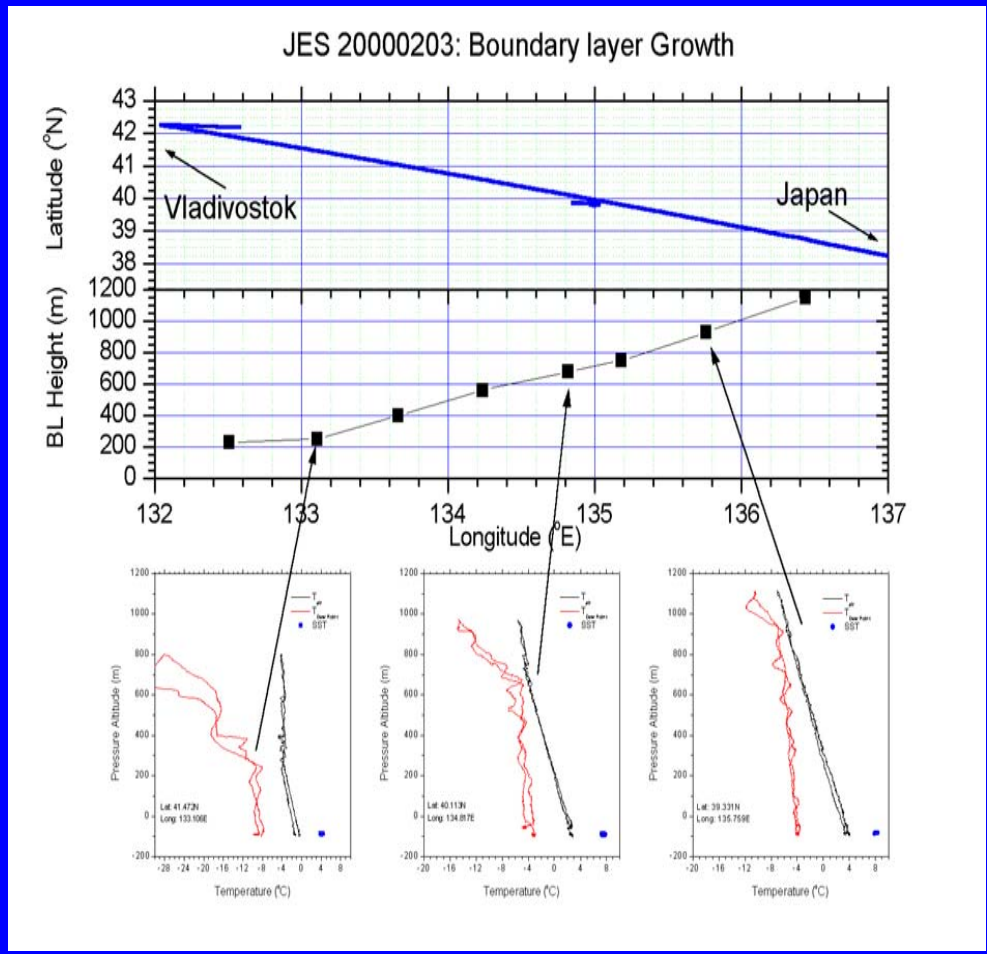


CIRPAS Research Instrument Example (Wind Lidar: Emmett)

TODWL two axis scanner



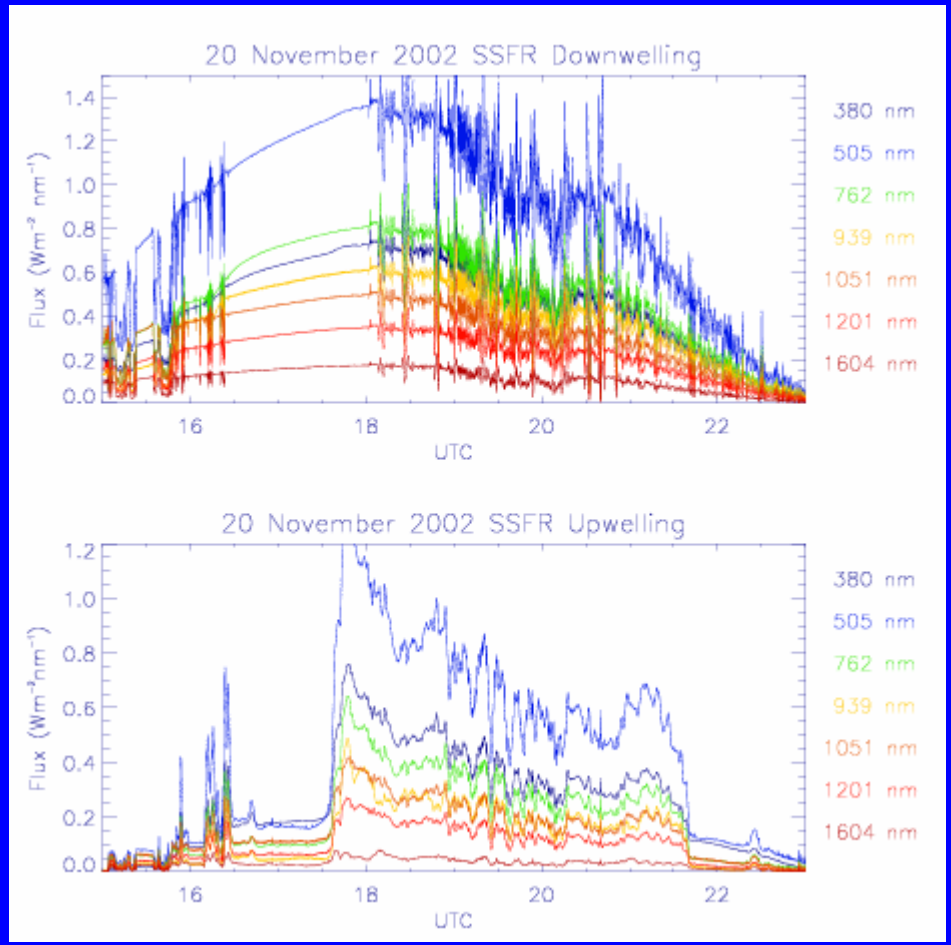
CIRPAS Research Instrument Example (Flux package: Friehe)



Instruments under development and their mentors

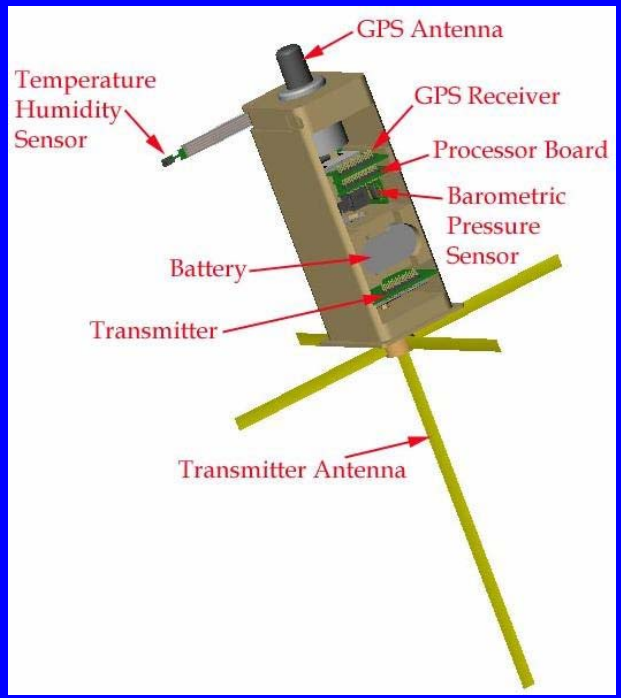
Instrument	Mentor
•SP2	Facility
•NMASS	Facility
•Stabilized Radiometer Platform	Anthomy Bucholz
•Multiangle Scatter Probe	John Seinfeld
•2D-Stereo Spectrometer	Facility
•Towed Body for Turbulence	Carl Friehe
•Photoacoustic Absorption	Facility
•3-Column DMAs	Facility

NEW INSTRUMENTATION
Stabilized Radiometer Platform



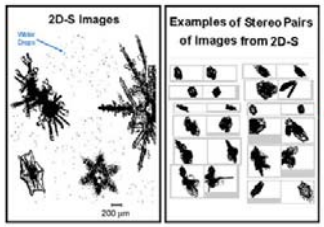
NEW INSTRUMENTATION

MICRO-SIZED AIR-LAUNCHED EXPENDABLE METEOROLOGICAL SENSOR (MAXMS)



NEW INSTRUMENTATION
2D-Stereo and CPI

Collaborative NSF/NAVY Effort to Develop 3V-CPI (Combination of 2D-S and CPI) for NSF HIAPER Aircraft



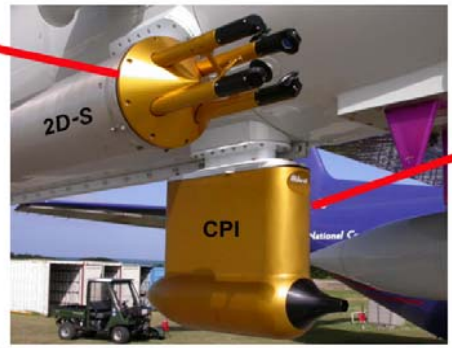
Sizes Particles 10 μm to 1.28 mm

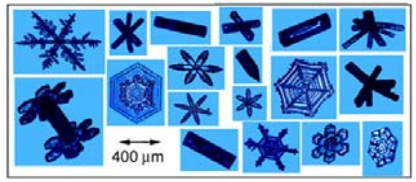
Large Sample Volume

Ultra High Data Rate

Excellent Particle Size Distribution

2D-S and CPI Probes Installed on NCAR C-130





High Resolution (2.3 μm pixel)

256 (8-bit) Gray Levels

Excellent Images of Particle Shape

How to request CIRPAS Support

Naval Postgraduate School
CIRPAS Twin Otter Request Form

Please complete these planning forms and mail, fax or e-mail to:
CIRPAS: C/O Bob Bluth, 3200 Imjin Road, Marina, CA 93933; Tel (831)-384-2776, Fax (831)-384-3277, e-mail rtbluth@nps.navy.mil.

Mission Scientist :		**Mission Dates:**	
Institution:		**Phone Number:**	
Address:		**Fax Number:**	
e-mail address:		**Flight Hours:**	
Mission Location:		**Number of flights:**	
Proposal Title:		**Funding Agency:** **If NSF then also** **Proposal number:**	

List all other PIs on science team.

	Name	Institution	Position	Dates Involved
1				
2				
3				
4				
5				

Describe mission objectives, location, and flight path requirements:

Sensors

CIRPAS Facility Measurements (Check which measurements are required)

☐ Time (UTC)	☐ Total Temperature	☐ FSSP Particle Size	☐ O_3
☐ Position (Lat/Lon)	☐ Dew Point	☐ CAPS Particle Size	☐
☒ Altitude GPS	☐ Static Pressure	☐ APS Particle Size	☐
☐ Ground Speed	☐ Dynamic Pressure	☐ CIP 2-D Particle Size	☐
☐ Ground Track	☐ Surface Temperature	☐ PIP 2-D Particle Size	☐
☐ Heading	☐ Mean Wind Speed	☒ TSI Scatter, 3λ	☐
☐ Pitch	☐ Mean Wind Direction	☐ PSAP Absorption, 3λ	☐
☐ Roll	☐ Vertical Wind Speed	☐ 2-D Stereo Particles	☐
☐ True Airspeed	☐ CN/Ultrafine	☐ NMASS CPC's	☐
☐ Radar Altitude	☐ PCASP Particle Size	☐ SO_2	☐

CIRPAS Research Measurements (Check whose collaboration is desired)

Request form on the CIRPAS and on the UNALS web sites:

www.cirpas.org

http://www.unols.org

How we can work with ARM

- Bring aircraft and instruments to IOPs
- Share instrument development costs through SBIR
- Offer ARM mentorship of instrumentation
- Provide Phased Array Radar or wind lidar to IOPs