Instrumentation and Preliminary Observations from the University of North Dakota Citation Research Aircraft during the NASA IPHEx Project

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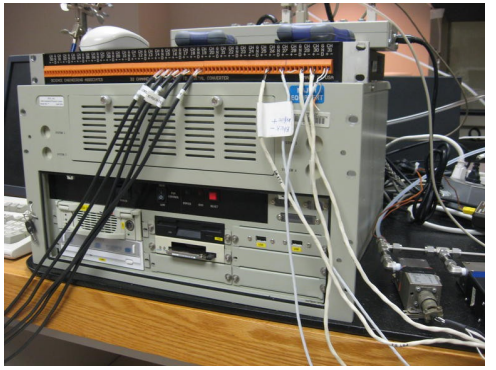
University of North Dakota Airborne Facility

- Cessna Citation jet aircraft modified for airborne measurements.
- Cloud physics and aerosol instrumentation.
- State-of-the-art aircraft data acquisition system.
- Robust open source data processing software.
- Experienced scientists.
- Top rated aviation educational institution.

Cloud Physics and Aerosol Instruments

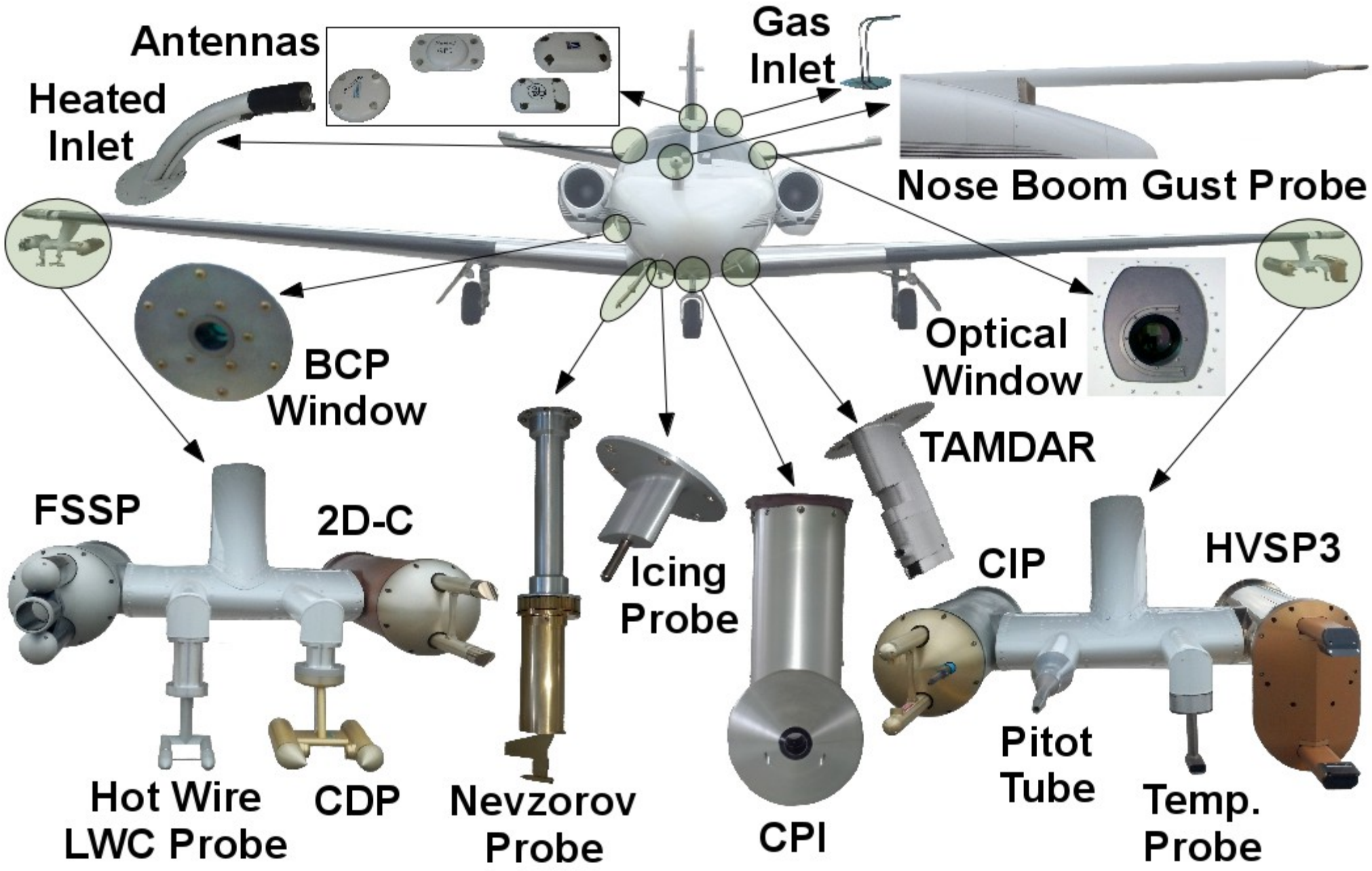
- Droplet Measurement Technologies [DMT] **Cloud Droplet Probe** [CDP] (Able to measure cloud droplets between approximately 3 and 50 µm diameter.)
- PMS **2D-C Optical Array Imaging Probe** (Able to detect cloud and precipitation particles between approximately 25 to 960 µm diameter.)
- King **Hot Wire Liquid Water Probe** (Able to measure cloud liquid water content.)
- **PMS Passive Cavity Aerosol Spectrometer Probe** [PCASP] (Able to measure particles between approximately 0.1 and 3.0 µm diameter.)
- **Cloud Condensation Nuclei Counter** [CCNC] (Able to measure the concentration of aerosols that activate at supersaturation between 0.2 and 1%.)

State Parameters Instruments

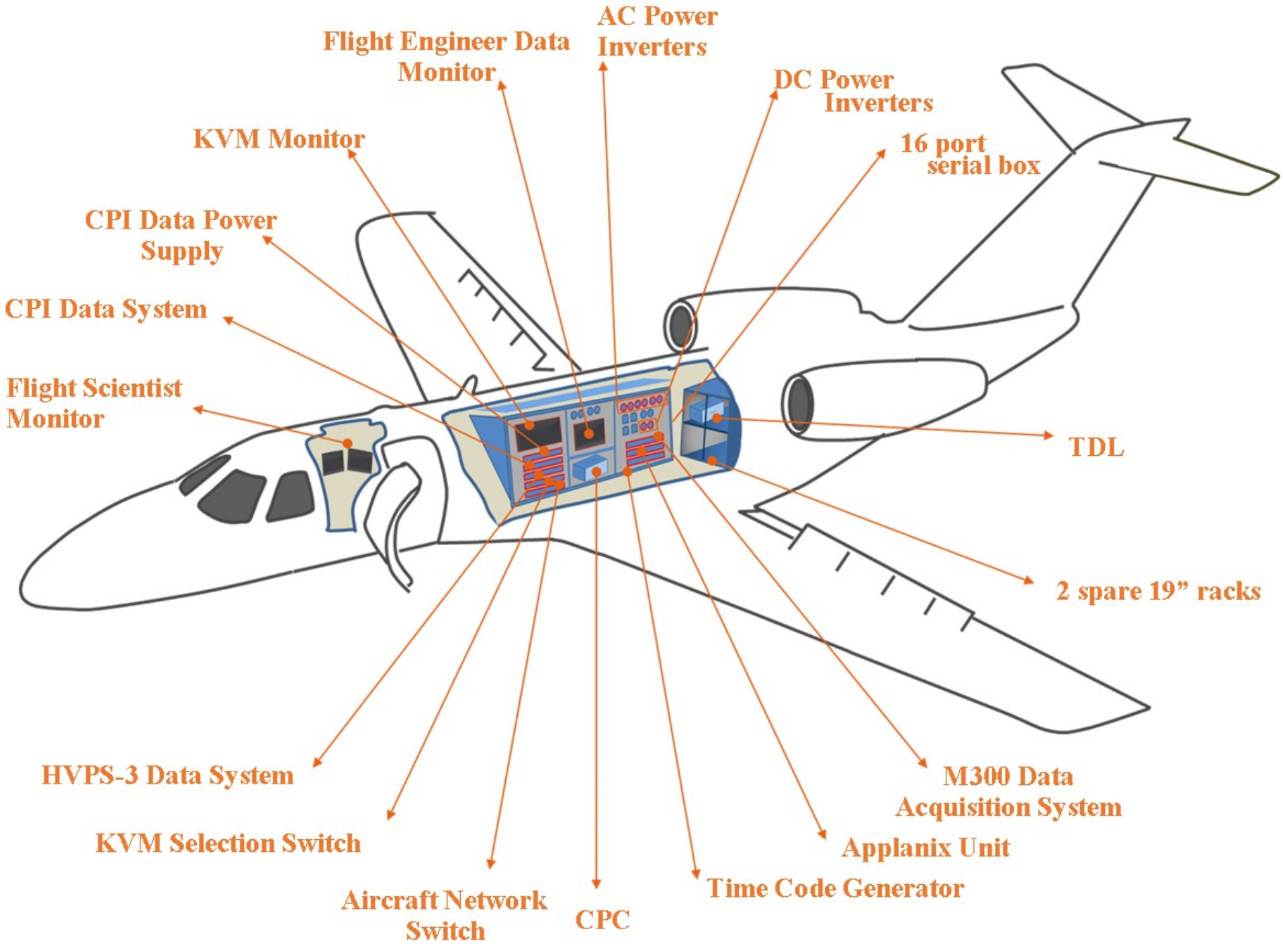


- APPLANIX **Position and Orientation System** (Able to measure position, velocity and acceleration relative to the earth's surface.)
- Nose boom with 5 port **Gust Probe** (In conjunction with POS, able to measure 3 dimensional winds.)
- EdgeTech Digital Aircraft **Hygrometer** (Able to measure dew point temperature.)
- Rosemount Aircraft **Temperature Sensor** (Able to measure total temperature.)
- **Pressure Transducers** (Able to measure static and dynamic pressure.)
- SEA M300 **Data Acquisition System** (Able to acquire instrument data.)

External Instruments: 2012



Internal Instruments: 2012



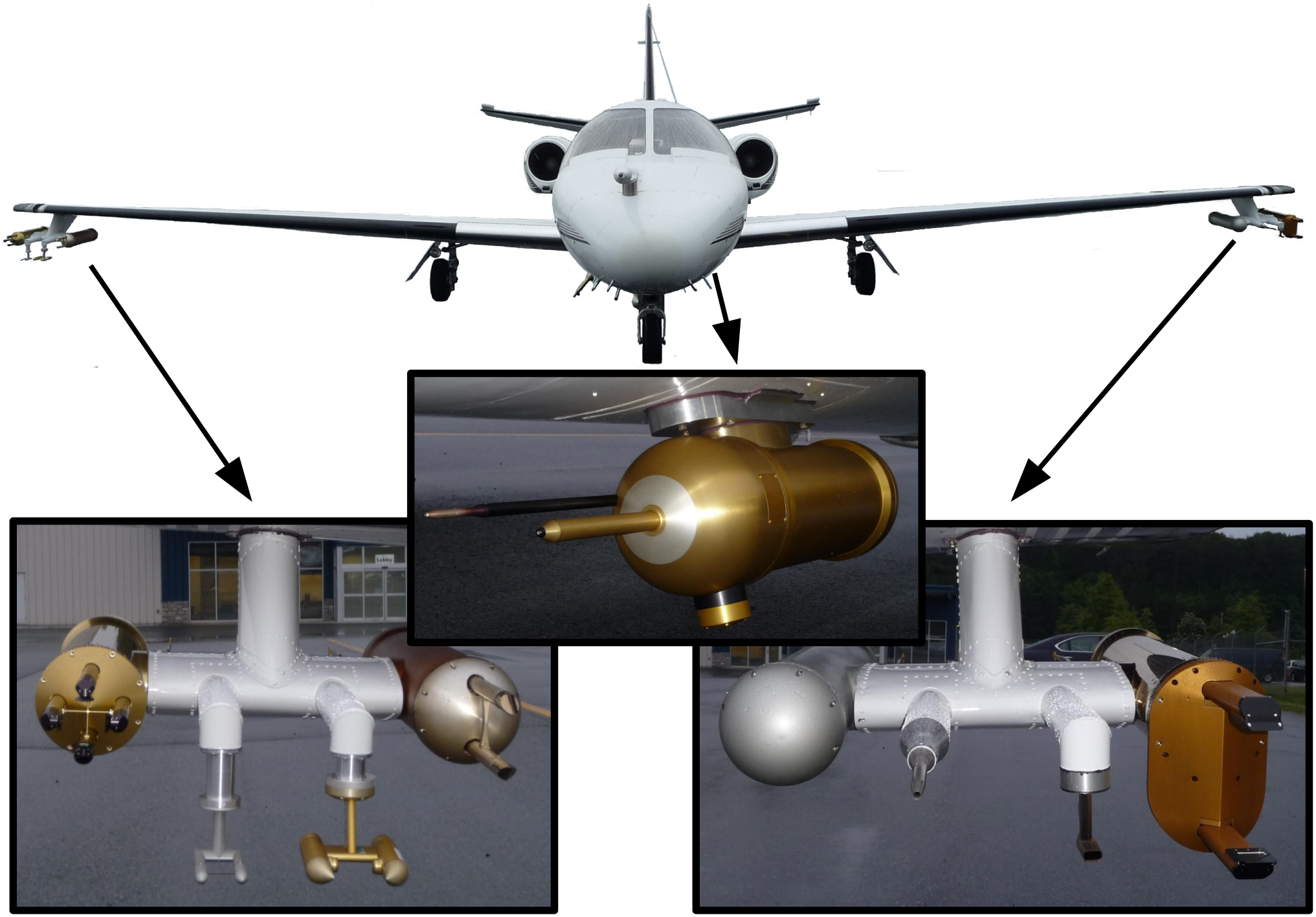
NASA IPHEx Field Project

The overarching objective of integrated hydrologic ground validation activities supporting the Global Precipitation Measurement (GPM) mission is to provide better understanding of the strengths and limitations of the satellite products, in the context of hydrologic applications. To this end, the GPM Ground Validation (GV) program is conducting one of several hydrology-oriented field efforts: the Integrated Precipitation and Hydrology Experiment.

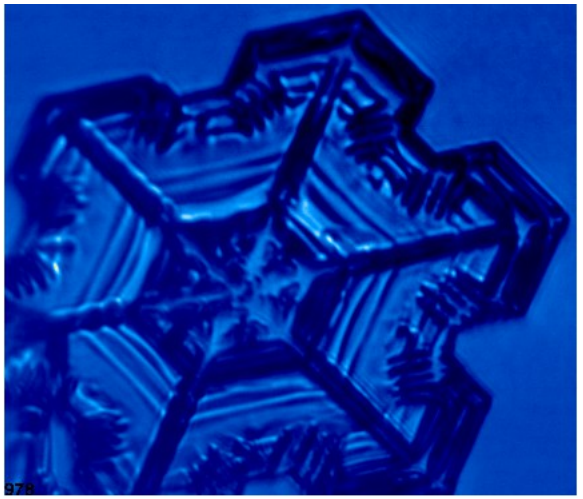
IPHEx Web Portal - https://fcportal.nsstc.nasa.gov/iphex

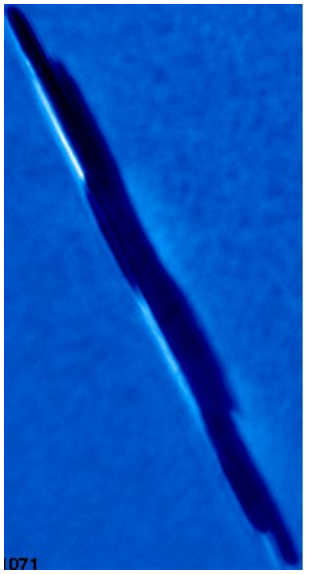
Flight Tracker - http://airbornescience.nasa.gov/tracker/

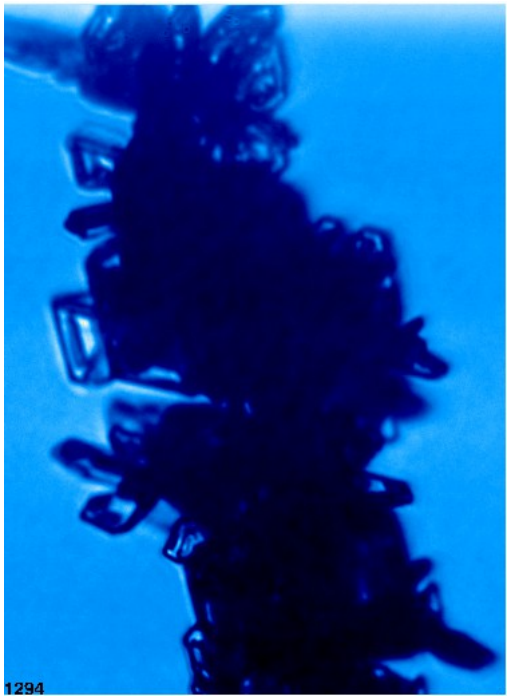
External Instruments: IPHEx

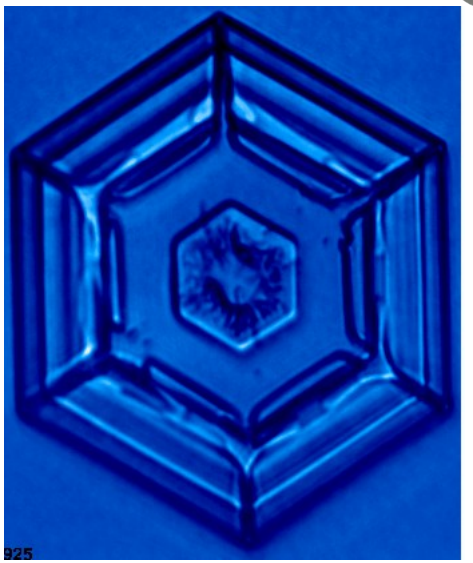


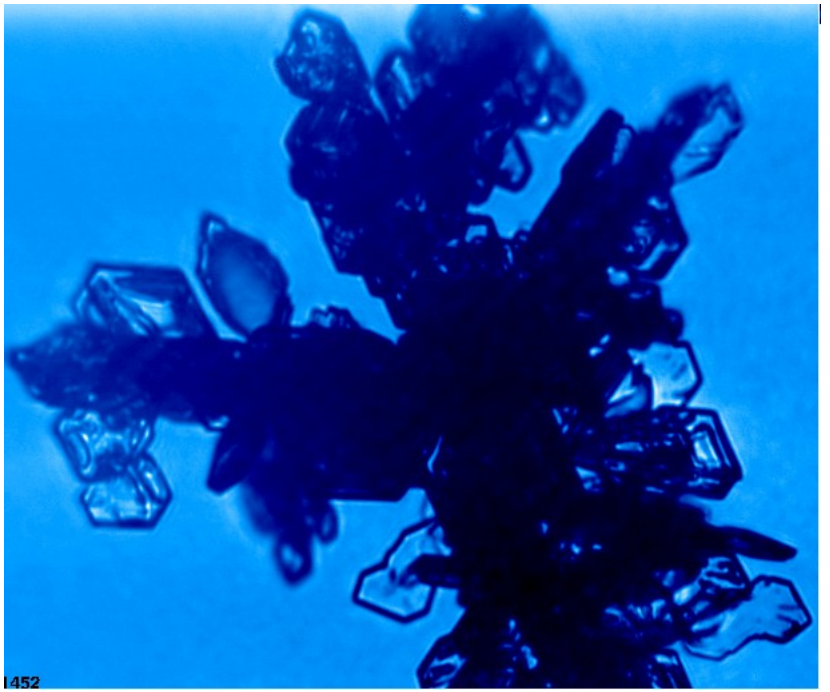
Cloud Particle Imager: 140518

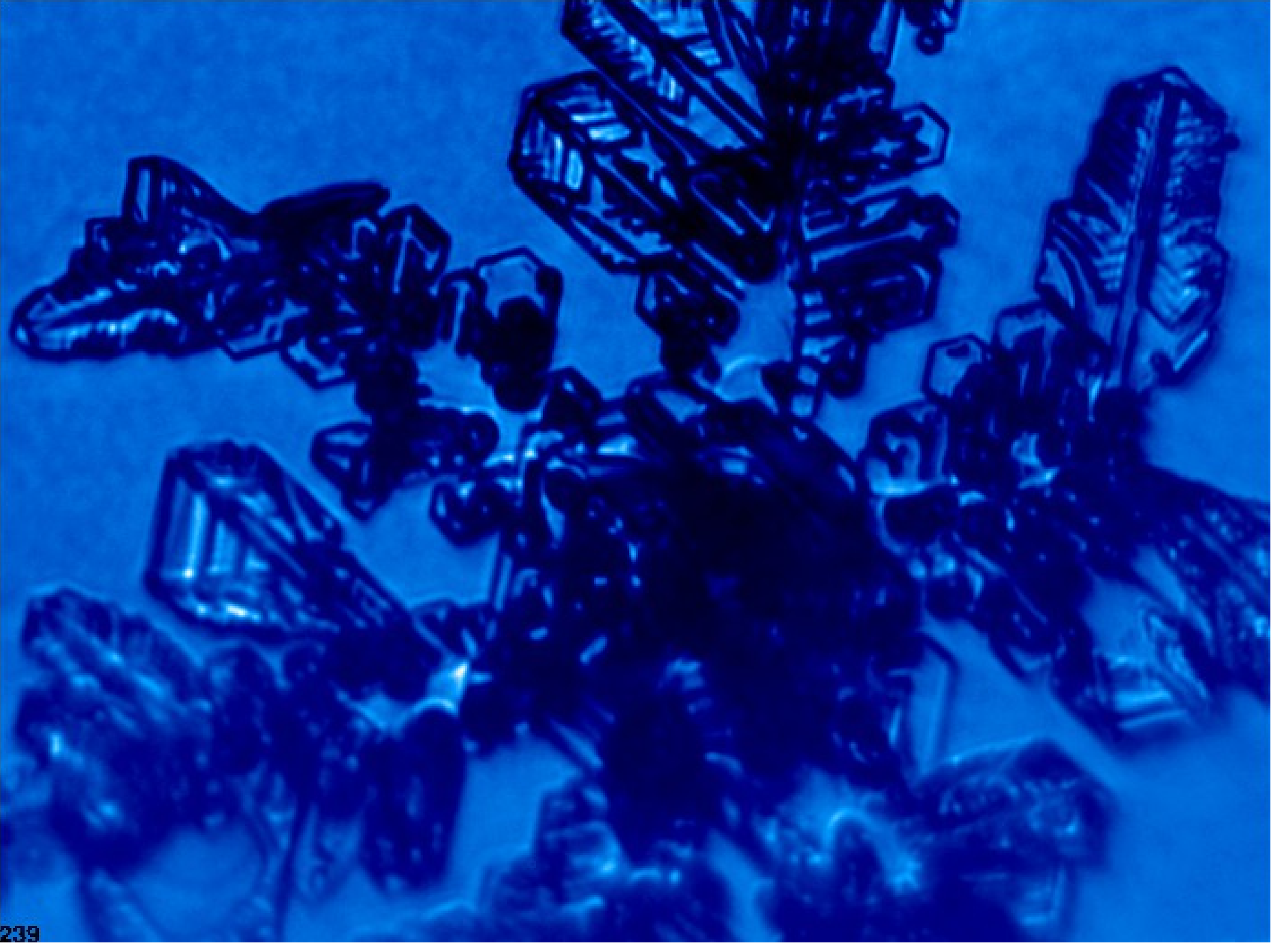












2D-C Probe: 140523