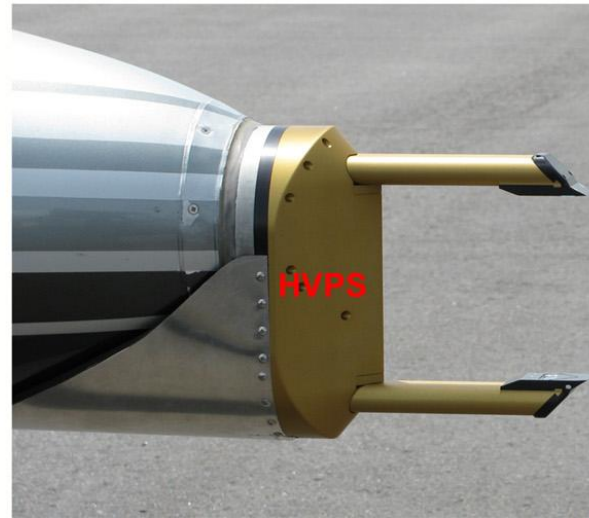
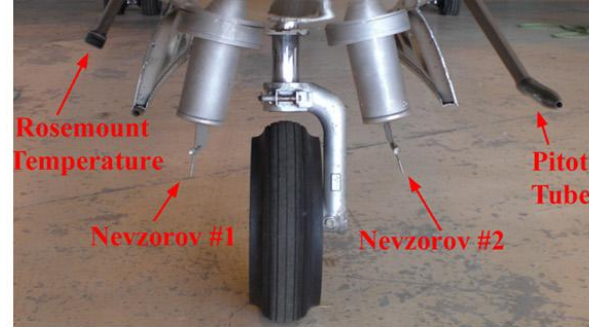


SPEC^{inc}

Participation in ICE-T with the SPEC Learjet



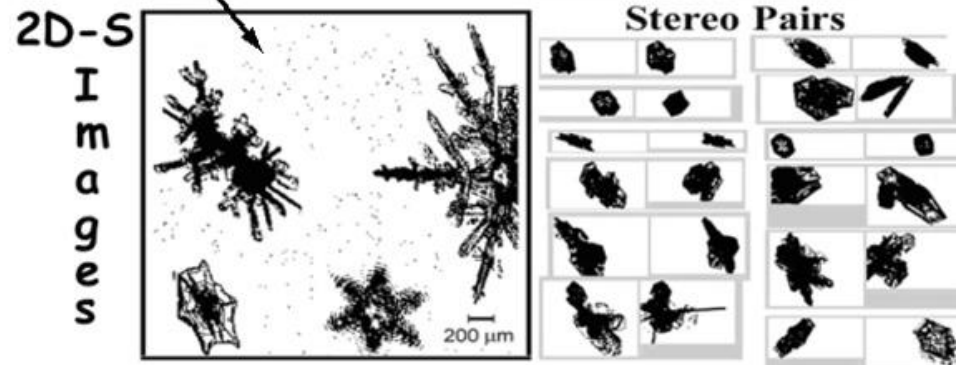
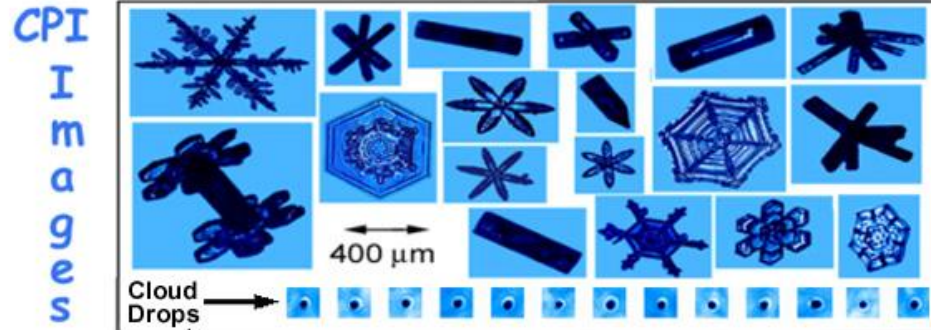
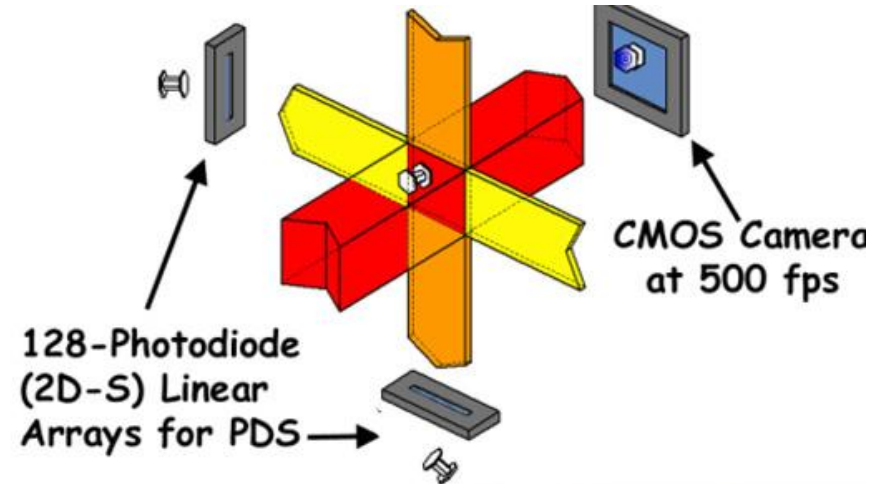
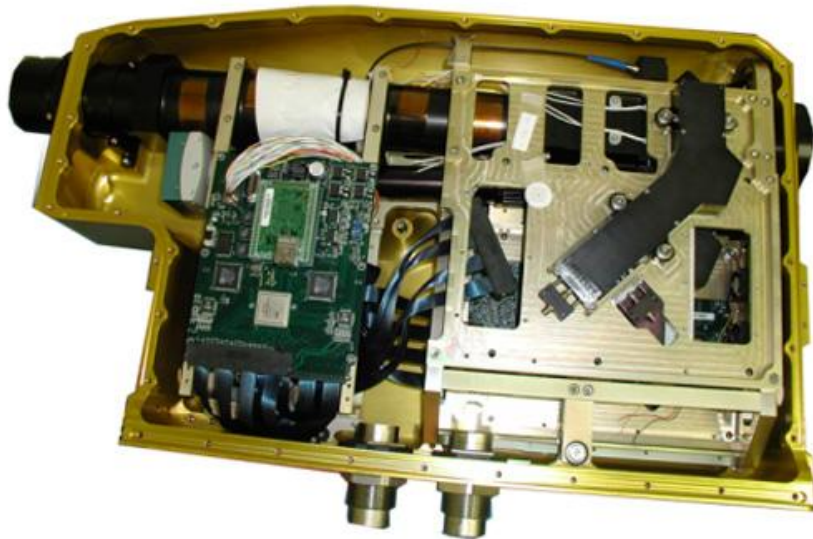
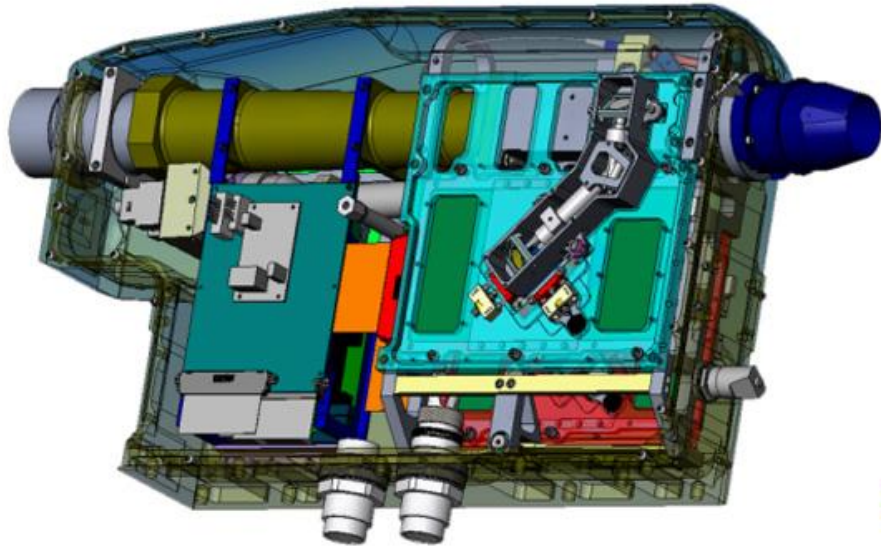
Paul Lawson and Brad Baker



Scientific/Flight Plan Overview

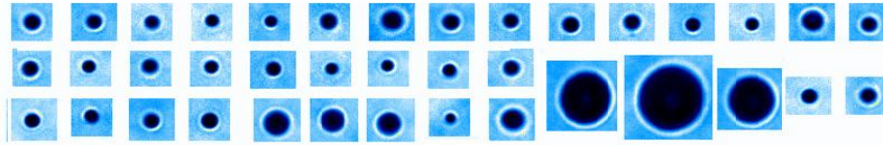
- **Learjet to 1) Penetrate New, Growing Cumulus at a Level Just Prior to Ice Nucleation (0 °C to - 5°C region) and Continue to make Rapid Penetrations while Climbing with the Updraft to Near Cloud Top (-10 °C to - 20°C), or 2) make Repeated Penetrations at a Constant Altitude (e.g., - 5°C), or 3) Dash and make One-pass Penetrations of as many Cu as Possible.**
- **New Instrumentation: 3V-CPI, Fast FSSP/CDP, HVPS Record Complete Particle Size Distribution from 1 μm to 2 cm.**
- **3V-CPI also records up to 400 frames per second of CPI Images Coincident with 2D-S Stereo Images. “Fish” for Ice > 30 μm.**
- **New Probe Tips and Inter-arrival Time Algorithms used to Remove Splashers and Shatterers from all Probes.**
- **Collaborative Modeling Effort with Morrison-Grabowski**

3V-CPI Developed Under NSF and Navy Funding. Combines Best Features of CPI and 2D-S

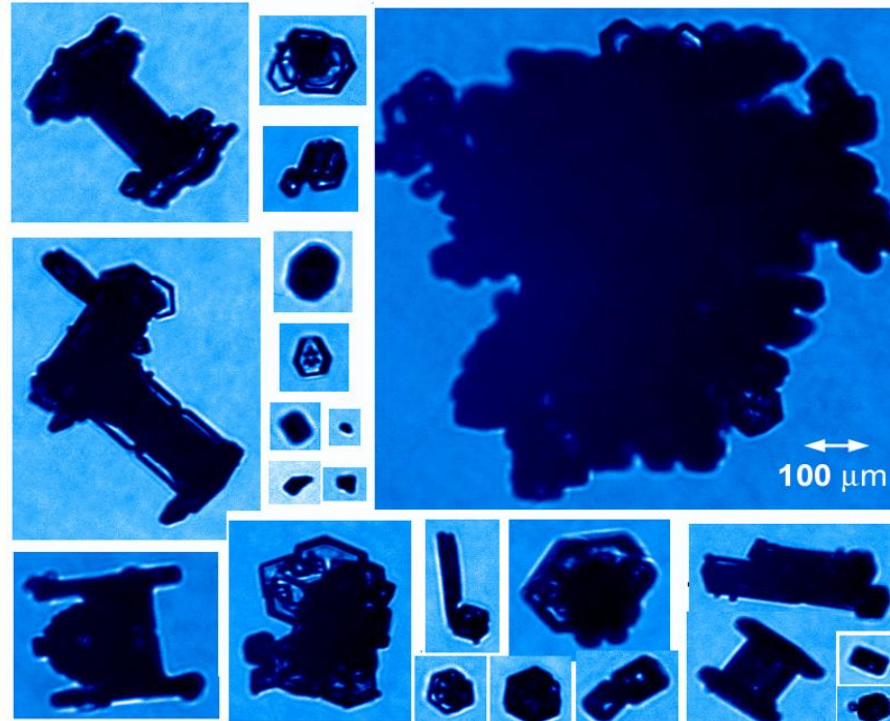


3V-CPI Images from NCAR GV (8-15-2010) in PREDICT

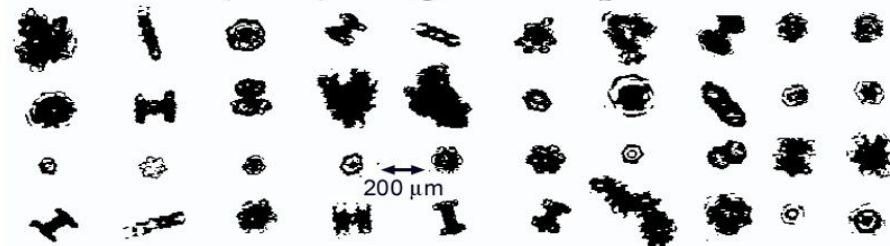
3V-CPI (CPI) Images of Water Drops in Cumulus



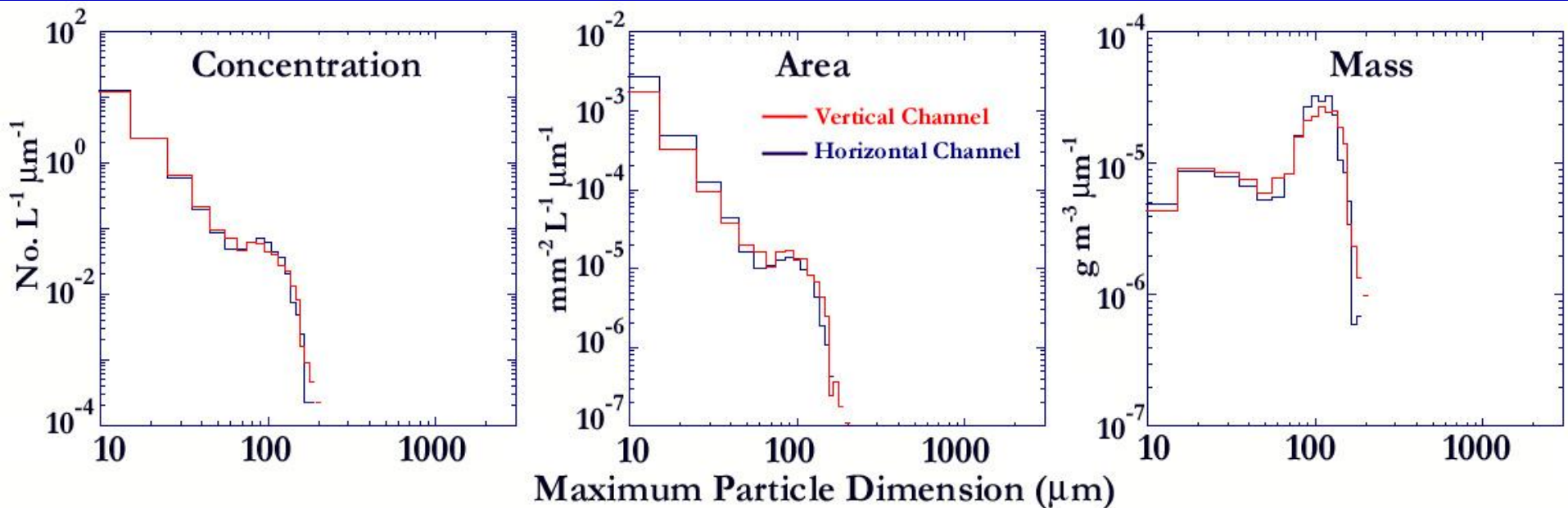
3V-CPI (CPI) Images in Tropical Anvil



3V-CPI (2D-S) Images in Tropical Anvil



Size Distributions from 2D-S Horizontal and Vertical Channels of 3V-CPI Probe Installed on NCAR GV in PREDICT (8-15-2010)



Features of the 3V-CPI

- **Retain all of the Present Features of the 2D-S:**
 - 1) Quantitative PSD from 10 μm to a few mm (e.g. Image both Cloud Drops and Ice Particles)**
 - 2) New Probe Tips and Inter-arrival time Algorithm Shatterer/Splasher Rejection**
- **CPI will be “Triggered” by the 2D-S.**
- **CPI Camera Frame Rate of 400 s^{-1}**
- **Three views of CPI/2D-S Images with Shatter/Splasher Rejection on Both Probes.**
- **Ability to “Fish” for Particles Larger than User-Selected Size (e.g., $> 30 \mu\text{m}$).**

Status of NSF Proposal and Learjet Readiness

- **NSF Proposal awarded.**
- **Instruments installed on Learjet except for 3V-CPI, which needs to be completed and flight tested (this is the Navy 3V-CPI. NCAR 3V-CPI was installed on the NSF GV for PREDICT). Fast FSSP will be borrowed from the DOE ARM.**
- **No current funding to support NCAR 3V-CPI installation on C-130**