

# Cosmic Dust Report

Dr. Marc Fries - Curator



- **No allocations since last CAPTEM meeting**
- **Two new requests received. Awaiting inventories from past PIs to re-allocate samples for a third pending request.**
- **Cosmic Dust database upgrades continuing**
  - Monthly meetings between CD processors and IT
  - Added a sub-sample tracking capability, numbered with comma system like Meteorite (e.g. L2010-Z-1,3)
  - Loan Requests are now stored in the CD database as .pdf files
  - Ability added to automatically generate emails to request renewals of loan agreements, etc.

# CAPTEM Subcommittee Report

Dr. Hope Ishii - Chair



- **The subcommittee reviewed 3 new requests since the spring 2017 CAPTEM meeting**
  - Total of 34 particles including 2 giant cluster particles
  - One recommended for full allocation (11 CS IDPs)
  - One recommended for partial allocation with revise and re-submit (20 cosmic and possible cosmic particles)
  - No allocation recommended for GC IDPs with revise-and re-submit (2 GC IDPs)
- **Subcommittee membership changes coming**
  - Current committee:  
Ishii, Flynn, Messenger, Wozniakiewicz, Taylor, Djouadi-Bouali
  - As of Jan. 2019: Bradley de Gregorio will replace George Flynn (>15 years of service) and Henner Busemann will replace Scott Messenger (15 years of service).

# Cosmic Dust Status: *Flights*

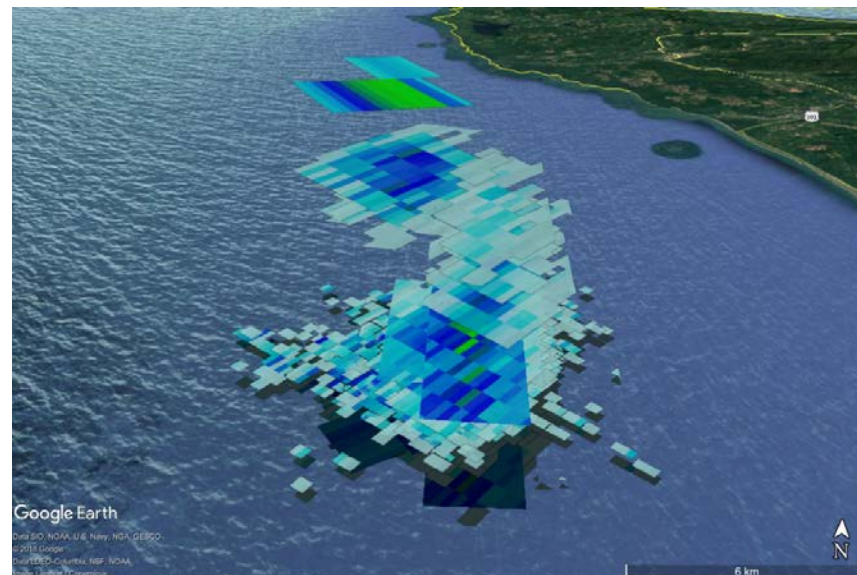


One ER-2 set of collectors exposed on a short flight (8 hours), beginning of February. Will expose further before collection.



# Cosmic Dust Status: *Flights*

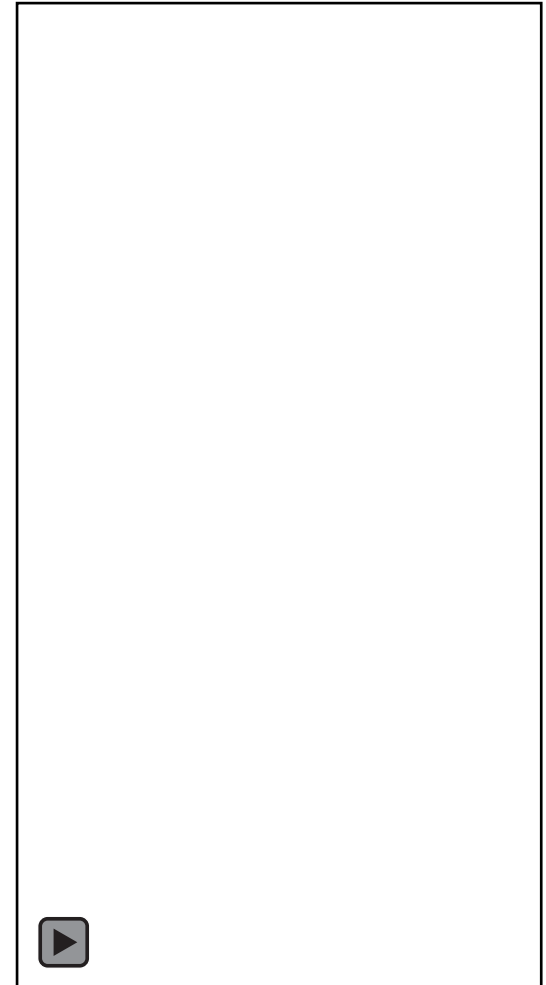
- No WB-57 flights since last CAPTEM meeting
- Requested an ER-2 flight to sample a massive meteorite fall off of the Washington state coast (08 Mar 2018)
  - Possibly the only way to obtain material
  - ~18 hour window to intercept dust before crossing into Canada, tracked with USAF collaboration
  - Flight could not be sorted





# Cosmic Dust Status: *Processing*

- Particle picking continues
- Freon replacement: **Replace with centrifugal force?**
  - Used to mix with oil to drip-coat collectors
  - Freon supply running short. Will need a replacement soon. Two options – Freon replacement, or a new coating method
  - Trial underway to test oiling collectors with spin coating





# Cosmic Dust Status: *Future I*

- **Institute/reaffirm policy where whole cluster particles will not be issued to individual PIs without compelling reason**

## **Preferred methods for study of CPs:**

- Consortium studies
  - Return of unconsumed material after analyses
  - Subdivision of CPs
  - or some combination thereof
- **Requirement will be added to CD requests that requestors must state the destructive-ness of their analyses**
    - Change will be made to Cosmic Dust Investigator's Guidebook

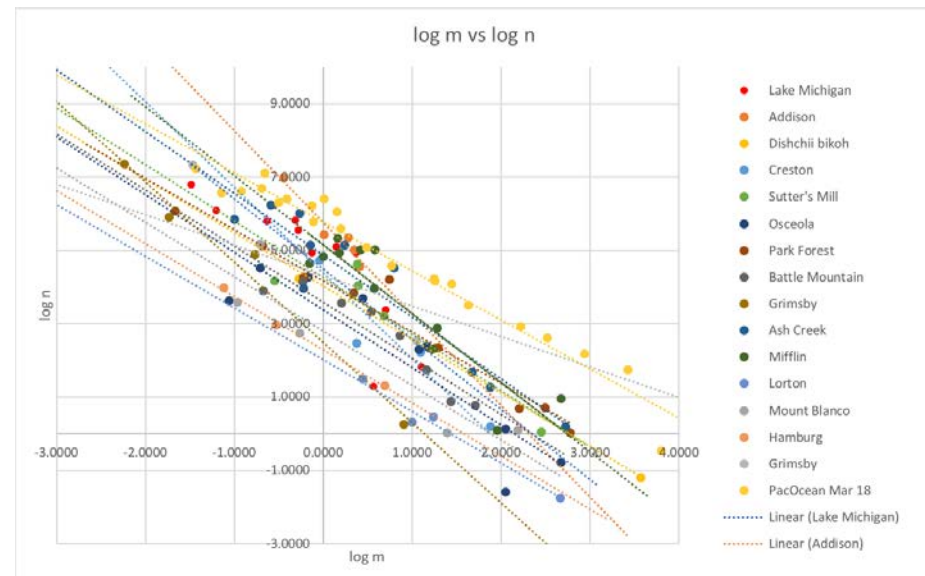


# Cosmic Dust Status: *Future II*



- **Whole-collector imaging prior to picking**

- No imagery currently exists of particles in as-received condition
- Two major reasons:
  - 1) good curation practice, and
  - 2) possibility for basic science with assessment of size on initial capture. Assess loss rate on picking. Measure size distribution to assess targeted collections
- Need to investigate new microscope, re-assignment of existing equipment?
- Will need ability to scan entire collector
  - Software, motorized stage





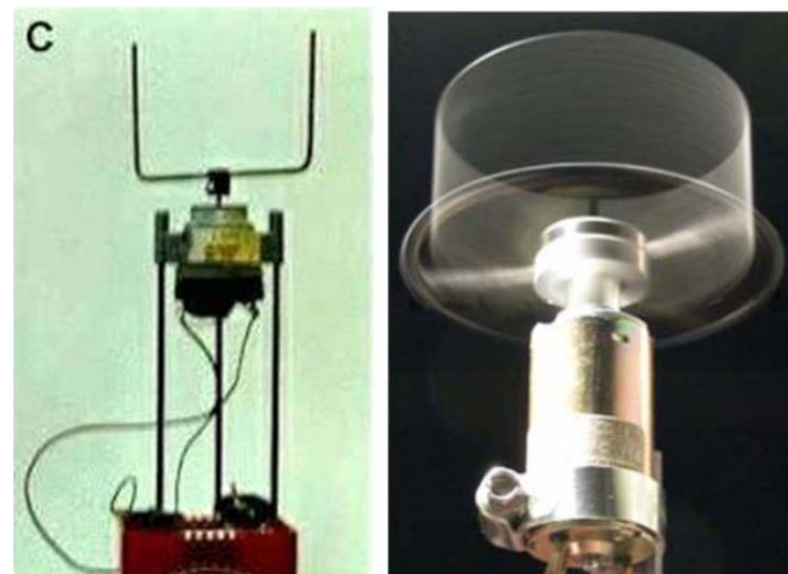
# Cosmic Dust Status: *Future III*

- Investigate phasing in dry collection
  - First, foam-based collection using methods developed with Dr. Scott Messenger
  - Mix of foam and oil-coated collectors will be flown in near term
  - Issues to address include:
    - Removing particles from foam. Six methods identified for testing with participation of Dr. Chris Snead. Vacuum tools, adhesives, cut foam, needle mount articulation
    - Degradation due to acidic aerosols without oil coating
    - Loss by airflow removal of particles? Need a formal assessment of collection efficiency of foam
  - There is no intent at present to **replace** oil collection with foam! Need testing of the above and community/CAPTEM feedback



# Cosmic Dust Status: *Future IV*

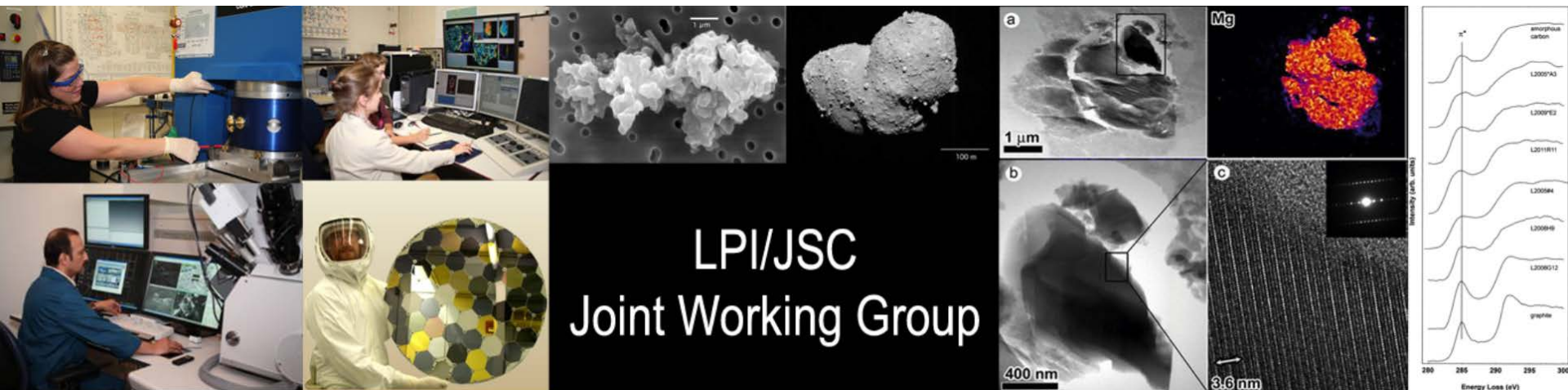
- **Balloon-borne collection will be investigated**
  - *Supplement* to aircraft collection, not replacement
  - Requires drawn-air collection using solar-powered fans
    - Low air speed facilitates dry collection
    - Long flight times (days, weeks?) samples large air volume despite low air speed
  - Uses foam, or large-area filters?
  - COTS, prior-use hardware exists for particulate and/or aerosol sampling
  - Reduces long-term risk versus:
    - Aircraft flight program descope
    - Collector hardware loss (only 2 WB-57 collector pylons in existence)





- **On-going ground-based high volume air sampling with large area filters**
  - Antarctic South Pole collection by Dr. Susan Taylor and her team
  - Mauna Loa collection by Ishii and Bradley?
  - Will maintain communication, extend Curation support for curating material from these projects

# Other Items



LPI/JSC  
Joint Working Group

## Sample Handling Training Opportunities: Second Training Session

- The LPI/JSC training sessions in small particle handling are of value to the community and are needed. Some requests have been submitted with skill levels that need improvement