

# Stardust Sub-Committee Report to CAPTEM

March 24, 2018

Presented by Gary Huss for Rhonda Stroud (sub-committee chair)

# Current Stardust Committee Membership

- Rhonda Stroud (Chair, March 2017-)
- Philipp Heck
- George Flynn
- Andrew Westphal
- Ryan Ogliore (new 2017)
- Thomas Stephan (new 2018) replacing Scott Sandford
  
- Will keep to a rotation schedule of 1 to 2 members per year

# Stardust Collection 10<sup>th</sup> Anniversary

- Samples returned to Earth January of 2006.
- Cometary PE concluded at the end of 2006. Collection opened for general allocation in 2007.
- Interstellar PE concluded at the end of 2014. Collection opened for general allocation in late 2014.
  
- **The only source of materials for laboratory analysis for which there is a 100% confidence in cometary origin**
  
- **No more returned comet samples for two decades!**
  - 2038 *If* CAESAR makes it out of Phase A.
  - Some discussion of a Chinese Space Agency sponsored comet sample return for 2034, but US participation limited

# Much more high impact science to be gleaned from these collections over the next two decades.

To paraphrase the curator, Mike Zolensky: “the majority of high value cometary samples have yet to be analyzed”.

*But only 1 request received since Fall CAPTEM meeting.*

Ad-hoc review committee formed to evaluate status of the collection and allocation

- Rhonda Stroud, Gary Huss, Thomas Stephan, Alessandra Rotundi
  - Representative of international sample analysis community--- not just the allocation review committee
  - Conducted community survey and performed site visit to curation January, 2018
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- **Goal: Get more high value samples out to the researchers; maximize the science return of the collection**

# Community Survey

- 80 active researchers identified with current or previously allocated Stardust samples
- 8 question survey sent to each researcher, with individual follow-up from ad-hoc committee as necessary
  - Addressed researcher satisfaction with the request and allocation process, on-line catalog, and the likelihood of future requests

# Stardust Curation Site Visit

- Ad-hoc committee spent 1 ½ days visiting Stardust curation
- Met individually with the Stardust Curator, Stardust collection managers, Head Curator
  - Toured cleanroom, sample processing
  - Viewed online catalog
  - Discussed ways JSC sees to improve the process, and increase community engagement

# Survey Summary

- Investigators expressed very high levels of satisfaction with the sample allocation during the PE period, and immediately after
  - Samples allocated quickly
  - Little PI pre-selection of samples needed to generate important discoveries
- Most researchers still report receiving samples within a few months of submitting a request
- A few researchers report long delays (6 months to > 1 year), or receiving samples inconsistent with requests

# Survey Summary

- Large majority of researchers expressed a preference for keeping the rolling request timeline; not moving to a bi-annual process
- A few researchers expressed frustration with review process
  - Impression that only proposals from consortia would be accepted
  - Wanted greater transparency in review status / better proposal feedback
- **Greatest source of frustration is in navigating the catalog**
  - Information to make an intelligent, targeted sample request not readily obtained
  - Much of presented information not comprehensible except to experienced Stardust PI's



# Survey Summary

- Researcher requested catalog features
  - List of ranked tracks, by type (carrot, bulb, etc.)
  - Optical images of tracks to go with ranked list, at high enough resolution to identify major terminal particles
  - Links to published results associated with specific track or particles
  - More clear indication of sample status and history

# Site Visit Summary

- Facilities and staffing for processing samples are in good shape
- 10 years of storage of aerogel tiles removed from tray shows no physical degradation of the aerogel
  - Supports removal of remaining tiles from the tray, while corporate knowledge for this process is still fresh
- Some concern over pending shut down for air handling upgrades, and Hayabusa 2 lab construction
  - Planned for FY19
- Curation maintains an internal catalog of the samples with additional information
  - De Gregorio assembled a comprehensive catalog with full references to published literature while a contractor at JSC
  - New database structure for public catalog allows this information to be imported

# Recommendations- 1

- Improve request / allocation transparency by setting up an email alias for the submitted requests / inquiries
  - Ideally curator, head curator, allocation review committee chair all informed at each step in the process from request to shipment of samples
    - Will not generate email tsunami because #'s of annual requests in the 10s max not 100s.
  - Need to work out details for having messages sent to committee chair because this may involve a private email address and government business

# Recommendations -2

- Encourage more requests by making high value samples readily available
  - Prepare ~ 5 new keystones at 6 month intervals over the next year
  - Announce the availability of these samples to the full comet and sample return community
    - Draw in Rosetta community
    - With optical documentation to aid in preparation request proposals
- Evaluate the success of this strategy after 1 year
- Consider harvesting some terminal particles / preparing new TEM grids and potted butts on a regular basis for researcher who can't work with whole tracks

# Recommendations- 3

- Strong focus needed on improving the catalog
  - Import De Gregorio database
  - Curator review needed of existing sample descriptions for accuracy
    - High level expertise in mineralogy and analysis methods needed; can't be delegated to curation assistants
- Make information more accessible to experts and novices
- High level information about tracks and craters
- Better keyword searching so that researchers (and allocation committee) can check for availability of specific minerals across multiple tracks