

**CAPTEM Minutes****Minutes of the Forty-Ninth Meeting of the  
Curation and Analysis Planning Team for Extraterrestrial Materials  
(CAPTEM)****Held virtually by WebEx on Monday, October 26<sup>th</sup>, 2015****Table of Contents**

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## 1. Agenda for Fall 2015 CAPTEM Meeting, October 26<sup>th</sup>

### 1:00 PM

#### *(1) Welcome, roll call (McSween)*

- CAPTEM: Hap McSween, Aaron Burton, Conel Alexander, James Day, George Flynn, Juliane Gross, Kieren Howard, Rhiannon Mayne, Kevin McKeegan, Larry Nyquist, Dimitri Papanastassiou, Jeff Taylor, Allan Treiman, Andrew Westphal
- Others: Jeff Grossman, Cindy Evans, Dave Draper, Francis McCubbin, Eileen Stansbery, Judy Allton, Ryan Zeigler, Mike Zolensky, Kevin Righter, Cari Corrigan

#### *(2) Approval of minutes from Spring 2015 meeting (McSween, Burton)*

#### *(3) Status of action items from last meeting (McSween)*

- Appoint a CAPTEM member as liaison for allocation requests of space-exposed hardware (Done)
- Transmit Lunar Cleanliness Report to HQ and JSC Astromaterials (Done)
- Add CAPTEM Conflict of Interest policy to website (Done)
- Add MWG appendix for the CAPTEM charter to websites (Done)
- Present findings regarding preservation of extraterrestrial materials and R&A reorganization to PSS (Done)
- Write a white paper on the effects of R&A reorganization and submit to HQ (Done)
- Clarify language for adding curators to the CAPTEM Charter (this meeting)

### 1:10 pm

#### *(4) NASA HQ report and issues needing attention/action (Grossman)*

### 1:30 pm

#### *(5) Issues from JSC/ARES needing attention/action (Evans, Draper, McCubbin)*

- Charter change for appointing subcommittee members [**Attached**]

### 1:45 pm

#### *(6) Curator/Subcommittee issues requiring CAPTEM attention/action (5 min max each)*

- Cosmic Dust (Zolensky, Flynn)
- Genesis (Allton, Nyquist)
- Asteroid Returned Samples (Zolensky, McKeegan)
- Stardust (Zolensky, Westphal)
- Lunar Samples (Zeigler, Treiman)
- MWG (Righter, Alexander)
- Informatics (Westphal)
- Facilities (Papanastassiou)

(7) Discussion/approval of proposed protocol for review of requests for space-exposed hardware (Taylor) [**Attached, also note recommendation at bottom**]

(8) PSS meeting report (McSween)

- NASA response to CAPTEM finding on sample retention from missions
- NRC will evaluate restructured R&A program
- Returned Sample Science Board for Mars 2020 mission
- Science nuggets – see <http://www.lpi.usra.edu/nuggets/>
- Decreasing R&A funding rates – what to do?
- Any new findings for PSS?

(9) New business?

2:45 pm

(10) Spring CAPTEM meeting schedule

- Saturday, March 20, 2015 (before LPSC, to avoid Easter weekend) at LPI
- MWG and Lunar allocation meetings on Friday and Sunday, respectively

(11) CAPTEM membership rotations (McSween)

- Thank you George Flynn and Dimitri Papanastassiou, for your long service on CAPTEM; Dimitri will continue as a member of the Lunar and Genesis subcommittees. Thank you Kieren Howard, for your service on MWG and CAPTEM.
- Replacements for Flynn (Hope Ishii), Papanastassiou (TBD), and Howard (Devin Schrader) (all beginning January 2016).
- Nominations for CAPTEM chair (beginning January 2017).

(12) Summary of action items (Burton)

3:00 pm

*Adjourn*

## 2. New actions for CAPTEM Fall 2015

- (1) Consider how to define the space-exposed hardware collection, particularly: i) what properties make a piece of space-exposed hardware curatable; ii) who makes the decision on what is or is not curatable, and iii) when is the decision made of whether or not something should be included in the collection (JSC, Taylor, Grossman).
- (2) Consider scientific data management standards for the sample analysis community (Westphal).

## 3. Welcome (McSween)

Approval of Spring 2015 Meeting Minutes: Motion approved unanimously.

## 4. NASA Headquarters report (Grossman)

### *Funding*

NASA is currently operating under a continuing resolution and funding levels are hoped to remain constant.

### *R&A Programs*

The ROSES programs targeted a ~20% selection rate in 2014. It is unclear whether or not this will be continued into ROSES 2015.

The National Research Council is performing a study on the effects of the NASA R&A program reorganization.

Proposals submitted to ROSES 2015 had a new requirement to include a data management plan for nearly all of the programs. There was considerable variation in the level of detail provided in the data management plans. CAPTEM was asked to consider defining scientific data standards for the sample science community.

### *Curation Policy*

There is a new top-level policy directive for all NASA science collections that was developed with the Interagency Working Group on Scientific Collections (IWGSC) and Office of Science and Technology Policy (OSTP), which will be managed out of the NASA Office of the Chief Scientist. Specific policy requirements for astromaterials and space-exposed hardware are being drafted. It is anticipated that CAPTEM will be asked to review the draft language for the Spring CAPTEM meeting. Curation plan requirements for missions are also being developed to define what state curation plans need to be in specific stages of mission development.

### *ANSMET*

The new agreements between NASA, the NSF and the Smithsonian Institution are continuing to undergo legal review. ANSMET was fully funded through the NEO program.

## **5. Astromaterials Curation and Facility Report (Evans / McCubbin)**

### *General*

Francis McCubbin started as Astromaterials curator on June 29<sup>th</sup>, 2015. Cindy Evans remains the Astromaterials Acquisition and Curation Office manager. Ryan Zeigler was named deputy manager of the Astromaterials Acquisition and Curation Office.

### *Planning for future samples*

McCubbin was named Mars Sample Curator. Marc Fries was named Curator of Planetary Ices and Organics as well as Curator for the Asteroid Redirect Mission (ARM).

### *Advanced Curation*

Fries is the NASA JSC Lead for Advanced Curation; he is working with Aaron Burton (NASA JSC) and Michael Calaway (Jacobs / NASA JSC). Fries, Calaway and Lisa Pace visited the cold curation clean room at Montana State University in Bozeman, MT to begin preparing for eventual cold curation sample return (e.g., comet surface sample return). The advanced curation lab obtained an Agilent 6890N GC-MS (gas chromatograph with mass spectrometer) and ThermoQuest Trace GC with FID (flame ionization detector) at no cost to the Astromaterials Acquisition and Curation Office. These instruments will be used for advanced curation research and testing.

The Strata-1 regolith experiment is being developed and certified for flight to the International Space Station in 2016 (Marc Fries is the Principal Investigator). Data obtained from this project will assist with tool and equipment design for handling regolith in microgravity. It will also help with understanding regolith mechanical properties to help with activities such as anchoring that could support the ARM, OSIRIS-REx and Hayabusa2 missions.

### *Mission Support*

OSIRIS-REx and Hayabusa2: Curation is archiving and documenting materials from spacecraft, and cleaning and deploying witness plates for construction phases. Curation is also contracting for the lab designs for OSIRIS-REx and Hayabusa2 curation labs.

Mars 2020: McCubbin and Evans visited JPL to meet with the Mars 2020 project about potential collaboration and curation involvement in Mars 2020. Details of the collaboration are still being formalized. Curation is continuing to support planetary protection requirements for Mars 2020 as well as the organic contamination Meeting of Experts. McCubbin has also been appointed as an ex-officio member of the Mars 2020 Return Sample Science Board.

Asteroid Redirect Mission (ARM): A curation budget was included in the budget planning cycle (HEOMD). Sample return requirements are feeding forward into Orion hardware requirements. Curation is also participating in an EVA tool working group. Marc Fries has been named the ARM curator and attended the first ARM FAST meeting.

Other Human Exploration Initiatives: Curation is involved in preliminary activities of forward-looking initiatives including Human Assisted Mars Sample Return, Human Exploration of Mars architectures, and other human exploration initiatives.

### *Allocation Highlights*

Overall, approved allocation numbers are up since a low point in 2014. A high number of returned lunar and meteorite samples have now been repatriated. In addition, 636 meteorite samples were transferred to the Smithsonian Institution. A total of 169 new meteorites were

announced in in the Spring and Fall 2015 newsletters. These meteorites were from the 2010 – 2013 ANSMET seasons. A total of 895 meteorites were returned from the 2013 and 2014 ANSMET seasons, with 335 and 560 meteorites collected each season, respectively. Cindy Evans will be participating in the next ANSMET mission in November.

### *Outreach*

The Educational Disc and Outreach programs have reached thousands of people. Curation held 10 Sample Disk Certification workshops, and four Authorized Trainer trainings in FY15. For FY cumulatively, curation has loaned 927 educational disks (523 lunar / 404 meteorite), along with 49 thin-section packages (26 lunar / 23 meteorite). In addition, 556 Lunar and Mars Soil Simulant sample packs have been loaned to educators, museums and students. There were 12 public outreach events that used curation-supplied displays; these events reached over 3,968 people. In addition, many of the Astromaterials samples/collections have been featured on various social media sites including the ARES blog, myares.wordpress.com, Facebook (NASA ARES), Twitter, and Instagram.

## **6. Curator / Subcommittee issues requiring CAPTEM attention / action**

### *Cosmic Dust (Zolensky, Flynn)*

There are no outstanding requests from the Cosmic Dust collection. Mike Zolensky reported that curation has been searching for a replacement for Freon as a cleaning agent; they have until December to decide. George Flynn reported on the successful analysis by Messenger et al. (2015) of pristine cosmic dust particles obtained with the oil-free, polyurethane foam substrate collector. Although there remain unanswered questions about the efficiency of the oil-free collectors and the ability to find individual particles, this technique offers a way to collect particles without exposing them to silicone oil contamination that interfered with several desired measurements. At the very least, it seems like a viable complementary method to the oil-based collectors going forward.

### *Genesis (Allton, Nyquist)*

There is one pending request that requires additional input from the PI. The laser subdivision capability is currently unavailable for multiple reasons, including age of the instrument (it is no longer supported by the vendor), and the laser lab is being moved temporarily to permit installation of the micro CT scanner. There are currently no subdivision tasks in the queue, although laser subdivision may be required for SiC and 13-C CVD targets. Options going forward include: repairing the existing laser scribe, acquiring a newer instrument (which would lower operating costs), outsourcing specific subdivision tasks, or sharing samples sequentially without subdivision as was done for oxygen, nitrogen and neon measurements.

### *Asteroid Returned Samples (Zolensky, McKeegan)*

JSC will receive another five Itokawa particles from the Hayabusa mission. All particles received to date have undergone PET. There is one pending request for a Hayabusa sample that is still waiting for additional information from the PI.

### *Stardust (Zolensky, Westphal)*

There were four new sample requests for this meeting of the Stardust subcommittee, as well as two sample requests that are pending (for three months and two months respectively). The first one is being processed, after which the second will be completed.

To date, there have been 141+ refereed publications; these are compiled in a Papers compendium.

There was a Stardust Workshop immediately before the 2015 MetSoc conference in Berkeley, CA. The workshop included 32 talks and 5 posters. Attendees of the workshop are working on a white paper focused on unsolved problems in planetary science that can be addressed by analyses of Stardust samples, with emphasis on instrumentation and sample preparation technique development. The meeting was supported by a grant from NASA, and CAPTEM was a sponsor of this meeting. There is also a working group with 21 members considering a book or special issue of *Meteoritics & Planetary Science*.

#### *Lunar Samples (Zeigler, Treiman)*

Since LPSC, 343 Apollo samples have been allocated. Four sample allocations are on hold, pending PI feedback and visits. The thin section lab has made 11 new thin sections, cleaned 750, repaired 160, and rounded four thin sections. A total of ~1,250 samples have been returned, and 669 samples were processed in. The Lunar lab has given 57 inside tours for 259 people and 51 viewing area tours for 669 people. In addition, 13 thin section sets and 162 disk allocations for outreach were made.

At the most recent Lunar Sample Subcommittee meeting, a total of 30 new requests for 391 Apollo samples were made; 323 new Apollo samples were approved. There was some discussion of making lunar reference powders and changing the 50% (by mass) sample reserve policy for Apollo samples. These items will be revisited at the Spring CAPTEM meeting.

Renovations on the new Micro-CT lab will begin in early January, and should be completed by late Spring. Solicitation of official bids for the Micro CT will occur soon, and the instrument is expected to be delivered by early summer.

A total of 20 new thin-section cases have been constructed to supplement the eight existing thin-section cases. As the existing thin-sections are moved into the new cases, each sample will be macroscopically photographed to ensure a consistent photographic record of all existing lunar thin sections. These images will be included with information about their respective samples in the Apollo sample database.

#### *Meteorite Working Group (Righter, Alexander)*

At the Fall MWG meeting, there were 38 new requests. A total of 593 samples were allocated to 75 investigators. There is one request that is still pending, as the PI requested that allocation be delayed. A total of 169 new meteorites from the 2010 – 2013 ANSMET field seasons were published in the Spring and Fall 2015 newsletters. Also, 636 samples were transferred to the Smithsonian Institution. Staging of the 2014-2015 ANSMET samples from the Dominion Range will begin this fall. The annual meteorite inventory is in progress. A new freezer was purchased for the meteorite processing laboratory. It was installed in August is working well. A new cabinet was purchased to address expansion needs. Custom modifications have been completed and the cabinet will be installed soon. The meteorite database is nearing completion and is undergoing final testing.

Mitch Haller left the meteorite processing lab in August to start graduate school at the University of Maryland. Rachel Funk started as a new meteorite processor in August. She earned her Master's degree at the University of Houston studying LAR shergottites. Julie Hopkin is the new Collections Manager at the Smithsonian Institution, replacing Linda Welzenbach.

*Informatics (Westphal)*

The informatics subcommittee is evaluating different methods for making data publicly available, including the Planetary Data System. In addition, they are evaluating requirements on proprietary data. These issues will be revisited at the Spring CAPTEM meeting.

*Facilities (Papanastassiou)*

There were no new facilities issues to report. However, Dimitri Papanastassiou is leaving the facilities subcommittee. A replacement has yet to be identified, but one is expected to be selected before the Spring CAPTEM meeting.

## **7. Discussion of possible CAPTEM role in curation and allocation of space-exposed hardware (Taylor/Zolensky)**

CAPTEM discussed a protocol for the review of space-exposed hardware requests. The protocol was approved by unanimous vote, pending minor grammatical edits. Once these edits have been made, the approved language will be added to the CAPTEM charter.

## **8. PSS Meeting Report (McSween)**

McSween updated CAPTEM on relevant news from the Planetary Science Subcommittee (PSS):

- The CAPTEM finding that the reservation requirement of 75% of mission-returned samples for future use for all such missions, including flagship missions, has been ratified by the NASA Science Subcommittee and approved by NASA.
- The National Research Council is evaluating the NASA R&A reorganization.
- NASA established a Returned Sample Science board to provide advice on sample collection and caching for the Mars 2020 mission. McSween is co-chair of that Board, and McCubbin is a member.
- The importance of Science Nuggets was re-emphasized for communicating important science results. Guidance can be found at [www.lpi.usra.edu/nuggets](http://www.lpi.usra.edu/nuggets).
- There is concern that the decrease in R&A funding rates is contributing to a continued decrease in the number of funded PIs, which is detrimental to science. NASA is aware of this issue.

## **9. New business? (All)**

With Dimitri Papanastassiou rotating off the facilities committee, there is a new need for a facilities liaison (rather than a Facilities Subcommittee chair). This is expected to be filled prior to the Spring 2016 CAPTEM meeting.

## **10. Spring CAPTEM Meeting Schedule**

The Spring 2016 CAPTEM meeting will be held at the Lunar and Planetary Institute in Houston, Texas on Saturday, March 20, 2016, immediately prior the Lunar and Planetary Science

Conference. The Lunar Subcommittee will meet on Friday before at the LPI, and the MWG will meet on Sunday before at the LPI.

### **11. CAPTEM membership rotations (McSween)**

CAPTEM thanks George Flynn and Dimitri Papanastassiou for their long service on CAPTEM. Dimitri will continue to serve as a member of the Lunar and Genesis subcommittees. CAPTEM also thanks Kieren Howard for his service on MWG and CAPTEM. Replacements for Flynn (Hope Ishii), Papanastassiou (TBD) and Howard (Devin Schrader) will begin in January of 2016. CAPTEM also discussed nominations for CAPTEM chair to begin serving in January, 2017, and McSween will send out electronic votes to CAPTEM members and JSC curators.

### **12. Summary of action items (Burton)**

Two action items came from this meeting:

- Consider how to define the space-exposed hardware collection, particularly: i) what properties make a piece of space-exposed hardware curatable; ii) who makes the decision on what is or is not curatable, and iii) when is the decision of whether or not something should be included in the collection (Taylor, Grossman).
- Consider scientific data management standards for the sample analysis community (Westphal).

Adjourn.