

CAPTEM Minutes

Minutes of the Fifty-second Meeting of the Curation and Analysis Planning Team for Extraterrestrial Materials (CAPTEM)

Held at the Lunar and Planetary Institute in Houston, TX on Saturday, March 25th, 2017

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1. Agenda for Spring 2017 CAPTEM Meeting, March 25th

8:15 am

Welcome and Introductions (McKeegan)

CAPTEM: Kevin McKeegan (Chair), Cari Corrigan, James Day, Richard Greenwood (in place of Conel Alexander), Juliana Gross, Jeff Grossman, Munir Humayun, Hope Iishi, Sam Lawrence, Francis McCubbin, Larry Nittler, Elizabeth Rampe (Secretary), Devin Schrader, Rhonda Stroud, Allan Treiman, Arya Udry, Richard Walker, and Ryan Zeigler

Others attending: Judy Allton, Mike Callaway, Dave Draper, Cindy Evans, Marc Fries, Dan Garrison, Andrea Harrington, Julie Hoskin, Richard Hurt, Jim Karner, Jeremy Kent, Andrea Mosie, Larry Nyquist, Lisa Pace, Aaron Regberg, Kevin Righter, Celia Cecilia Satterwhite, Carol Schwarz, Eileen Stansbery, Jeff Taylor, Nancy Todd, Kim Willis, Vanessa Wyche, Tom Zega, and Nicole Zellner

Approval of minutes from Fall 2016 meeting (McKeegan, Rampe)

Status of action items from last meeting (McKeegan)

- 1) New appointments have been filled. Genesis (Nittler) , Asteroids (Humayun), Informatics (Lawrence)
- 2) Storing witness coupons (McCubbin)
- 3) NRC received white paper, and the report was delivered (McSween)
- 4) Anticipate working with HQ for needed analytical facilities. Pending.
- 5) Identify CAPTEM facilities contact person during today's meeting.
- 6) Continue to look at accuracy of lists of Subcommittees and keep track of who has been working on Subcommittees for how long.

Approval of/changes to agenda for Spring 2017 meeting (McKeegan, Rampe)

Saturday March 25th

8:40 am

Opening Remarks from EISD Director (Wyche)

9:00 am

NASA Headquarters briefing (Grossman)

9:30 am

JSC organizational report (Evans)

9:45 am

JSC facilities report (Pace)

10 am

Break

10:20 am

JSC Astromaterials curation report (McCubbin)

10:50 am

MWG curatorial/allocation report (Righter)
MWG dismissed for allocation meetings

11:20 am

Stardust curatorial/allocation report (Stroud)

11:30 am

Cosmic Dust curatorial/allocation report (Ishii)

11:40 am

Asteroid curatorial/allocation report (Humayun)

11:50 am

Genesis curatorial/allocation report (Allton)

Noon

Break for lunch

1:30 pm

Lunar samples curatorial/allocation report (Zeigler)

1:50 pm

Update on Apollo 11 sample bag (Zeigler)
Harassment of committee members and how to respond (Zeigler)

2:10 pm

Informatics report (Lawrence)

2:30 pm

Break

3:00 pm

Other activities:

- CAPTEM facilities contact person – volunteer needed
- New CAPTEM members: MWG Chair discussion
- Planetary Science Vision 2050 workshop (McKeegan/Grossman/McCubbin/Zeigler)
- Science bullets
- CAPTEM white paper/NRC study status (McKeegan, Grossman)

4:00 pm

New business:

- CAPTEM-sponsored initiatives or workshops
- Solicitation of ideas for marking 50th anniversary of Apollo 11

4:30 pm

Adjourn

Sunday March 26th

8:20 am

New business

Schedules for Fall (online) and Subcommittee meetings

- New agenda items for following meetings

9:00 am

Discussion of any CAPTEM findings to be brought to PSS

9:15 am

Action items summary (McKeegan, Rampe)

9:30 am

Meeting adjourned

2. New action items from this meeting

- (1) CAPTEM will continue to anticipate working with NASA Headquarters on developing an investment strategy for needed future analytical capabilities and facilities, following delivery of the NRC study. The NAS will be performing a similar study. Distribute announcement of NAS meetings within CAPTEM so that members can read minutes from meetings.
- (2) Update process for allocating Stardust samples to the community. Need to survey the PI community to characterize frustrations with the process of requesting samples and find out how better CAPTEM can serve them (Stroud, McCubbin).
- (3) Review the Stardust website.
- (4) Determine the rate and method of delivery of Hayabusa particles (Zolensky).
- (5) Organize data from previous studies to evaluate requests for Genesis samples (Allton, Nittler).
- (6) Find new members to serve on the Genesis Subcommittee.
- (7) Informatics Subcommittee members should continue to assess the online catalogs because many have been updated recently.
- (8) Identify the community standards for reporting results from extraterrestrial materials by surveying the community (Informatics Subcommittee, Treiman, Zellner, Gross, with Grossman as an advisor).

(9) Contribute ideas to celebrate 50th Anniversary of Apollo samples to Google Doc that will be set up by McKeegan.

(10) Investigate costs and logistics associated with changing the spring 2017 CAPTEM meeting to the Saturday before LPSC (McKeegan).

(11) Send requests for MWG chair.

(12) Find a date for virtual fall meeting.

3. Welcome (McKeegan)

Approval of the fall 2016 Meeting Minutes: Motion approved unanimously.

Disposition of action items from last meeting:

Action item 1: Membership of some Subcommittees needs revamping, including two chairs (Asteroids, Genesis).

Resolution: L. Nittler is now chair of the Genesis Subcommittee, M. Humayun is chair of the Asteroids Subcommittee, and S. Lawrence is chair of the Informatics Subcommittee.

Action item 2: Francis McCubbin will consider a role for CAPTEM in planning for storage and allocation of Mars 2020 mission witness coupons to be housed at JSC and will provide a briefing at the spring CAPTEM meeting.

Resolution: Witness coupons from the Mars 2020 mission will be stored at JSC.

Action item 3: Hap McSween will ensure that the NRC committee reviewing the status of NASA's analytical facilities relevant to CAPTEM have received the white paper CAPTEM wrote regarding this subject.

Resolution: Hap McSween confirmed the NRC committee received the white paper written by CAPTEM. The NRC report regarding NASA's analytical facilities has been delivered.

Action item 4: CAPTEM will anticipate working with NASA Headquarters on developing an investment strategy for needed future analytical capabilities and facilities, following delivery of NRC study.

Resolution: This action item is pending. CAPTEM is awaiting the results of the NRC study.

Action item 5: Identify a CAPTEM Facilities Contact Person.

Resolution: During today's meeting, Kevin McKeegan volunteered as the Facilities Contact Person for Lisa Pace.

Action item 6: Subcommittee chairs should send lists of their current members and appointment dates to CAPTEM Secretary.

Resolution: Current members and appointment dates have been tallied in an Excel spreadsheet.

4. NASA Headquarters report (Grossman)

Planetary Science Subcommittee Dissolving

The Planetary Science Subcommittee (PSS) will be replaced by Planetary Advisory Committee (PAC). This is a FACA committee, and members will report directly to Jim Green, rather than to the NASA Administrator. Nominations will be accepted through March 31st 2017. As a result of this change, the analysis group function of CAPTEM is completely independent.

R&A Programs: Budgets and Selections

We are under a CR until April 28th 2017. Headquarters is working under the assumption that the R&A budget will be similar to last year and that the curation budget will be what was outlined in the last couple of years.

LARS will have the same budget as FY16. There was a 43% selection rate in FY16. LARS selected four proposals from Genesis, four from Stardust, and four from Asteroid, though many are cross disciplinary. This is different from previous LARS selections because proposals were selected to support future sample return (i.e., "readiness," which includes instrument and technique development).

Three selection cycles for Emerging Worlds have been completed. Its budget is similar to what Cosmochemistry used to be. In FY16, there was a 21% selection rate.

Planetary Major Equipment currently has a \$1M budget.

The ROSES 2017 call is out as of February 14th 2017.

O-REx Participating Scientist Program call will be coming out next week to assist the mission during asteroid ops.

Meteorites

ANSMET is up and running under new three-agency agreement. Fuel problems and shortage of planes resulted in a shortened field season this year, and 219 meteorites were collected. The Meteorite Steering Group will have its first meeting under new three-agency agreement in April 2017. ANSMET has been funded under the NEO Program (Mike Kelley is the NEO lead on ANSMET) for five more years.

Sue Taylor is collecting micrometeorites in air under an Emerging Worlds proposal. The collected materials will become part of JSC cosmic dust collection.

Mission Updates

O-REx completed its first science activity (a training exercise) to look for Earth-Trojan asteroids. Cameras are operating and discovered main belt asteroids.

New Frontiers 4 proposals are due April 28th 2017, and the types of missions highlighted in the call includes two sample return opportunities (Moon and comets).

The Mars 2020 mission was called out specifically in President's budget. There are ongoing discussions about where to land and samples to collect. This mission could lead to sample return in 2030s.

The JAXA MMX mission to Phobos is going forward. An instrument was solicited from NASA. This may result in samples curated at JSC.

The Asteroid Redirect Mission was not favored in President's budget.

O-REx will be the next big sample collection. It is currently in outbound cruise, and gravity assist will occur in September. Asteroid approach will occur late summer 2018, sampling will occur in summer 2020, and samples will be returned in 2023. CAPTEM can expect a lot of activities surrounding the return of samples from O-REx.

Timeline of NAS Studies

The National Academy is performing a new study, Sample Analysis Future Investment Strategy, about how are we investing in sample curation and analysis and how we partner with international facilities. The new study should be out in a year.

5. Opening remarks from EISD Director (Wyche)

The goal of the Engineering Integration and Science Directorate at JSC is to integrate HEO and SMD activities (i.e., to integrate science needs with human exploration). ARES is a division under EISD (code XI). Current plans for EISD include development of cis-lunar habitation modules. There is no direction to go to the surface of the Moon, but the international community does have interest in this activity, and EISD will support them in their efforts.

6. JSC organizational report (Evans)

Cindy Evans is the ARES Division Chief, and Lisa Pace is the Deputy Division Chief. ARES is made up of the Astromaterials Acquisition and Curation Office (XI2), the Astromaterials Research Office (XI3), and Exploration Science Office (XI4). New Civil Servants include Sam Lawrence, Jeremy, Julie Mitchell, Aaron Regberg, Andrea Harrington, and Liz Rampe. ARES has a robust Advanced Curation team! The ARES Strategic Plan was released, including five reports. These reports include a set of near term and strategic goals through 2030. Many goals are directly relevant to curation, including the need to establish a facilities plan.

7. JSC facilities report (Pace)

Lisa Pace is the Chair of strategic facilities, and she discussed the strategic facility plan. A professional engineering firm was hired to do a facilities assessment of the ARES buildings at JSC, and the assessment is due next week. Building 31 is >50 years old, and three of the four buildings where ARES has facilities will be demolished or claimed by other buildings in the coming years. Building 31N (where the Apollo samples are curated) was upgraded five years ago and is in better shape than Building 31 main.

Major findings of the assessment were to support future collections. In FY19, advanced curation and cleaning facilities will be under construction for O-REx and Hayabusa 2 samples. The assessment recommended consolidating ARES facilities in close proximity to one another. Building 29 could be combined with a new or renovated Building 31. Building 29 would house research, mission ops, exploration science, and Building 31 would house curation and research. Next steps include making the case to the Center about moving to Building 29.

A new facility concept for Building 31 will include flexible space modular containment facilities. Planning will be ready for potential sample returns from New Frontiers 4.

8. JSC Astromaterials curation report (McCubbin)

Updates to the Office

Ryan Zeigler is the new manager of the Astromaterials Acquisition and Curation Office. New hires include Andrea Harrington (Civil Servant, medical geologist), Aaron Regberg (Civil Servant, geomicrobiologist), Christopher Snead (contractor, small particle handling), Dan Coleff (contractor, run the micro XCT), and Carla Gonzales (contractor, process Stardust samples).

Curation Support to New Missions

90% and 100% design reviews for O-REx and Hayabusa 2 labs were both successful, and construction will begin in FY19 on the facilities.

Francis continues to be an ex-officio member of the Mars 2020 Return Sample Science (RSS) Board and will be archiving witness materials and coupons in the next 6 months from Mars 2020. Francis will request a new Subcommittee for archiving witness materials soon.

Many sample return missions will be proposed through New Frontiers 4, and curation is in a supporting role in all of those proposals.

Allocation highlights since November 9th 2016

Two Stardust allocations were worked and three samples were allocated. 30 Cosmic Dust samples and three Hayabusa samples were allocated. 21 Genesis flown samples and eight non-flight reference samples were allocated. 206 Apollo samples were allocated and 119 Apollo samples have been returned. 322 meteorite samples were allocated and 264 meteorite samples were returned. 180 new meteorites were announced from the 2013, 2014, and 2015 seasons and were published in the Spring 2017 newsletter. Samples (~220) from the 2016-17 ANSMET season are

expected to arrive at JSC in late March. Over 1800 samples were allocated in 2016. The 10-year average is 1449/year, and the projection for 2017 is 1423.

Outreach highlights

Thousands of people have benefited from educational disk and outreach programs. In FY17, there have been two sample disk certification workshops and two refresher trainings. Since October 2016, 289 disks (157 lunar/132 meteorite), 8 thin section packages, and 27 Lunar and Mars soil simulant sample packs have been on short term loan to educators, museums, and students. 22 public outreach displays have reached over 2,504 teachers, students, and members of the public. Many social media sites feature Astromaterials (including Facebook, Twitter, Instagram, and a blog myares.wordpress.com)

Vision for advanced curation

For the future of curation, we must ask, how do we enhance current collections, maximize return from existing collections, and prepare for new collections?

In the near term, the following tasks must be achieved: advances in small particle handling in glove boxes to prepare for processing O-REx and Hayabusa 2 samples, determine the microbial ecology of cleaning labs, develop advanced cleaning and cleanliness verification protocols, quantify effects of micro-XCT on ability to conduct other types of analytical techniques on samples, and update existing sample compendia (beginning with Mars).

In the longer term, the following tasks must be achieved: develop new methods/collectors for Cosmic Dust that do not involve silicone oil, develop process improvements to ATLO that are consistent with the Curation and Planetary Protection Offices, identify a mechanism to report new micro XCT results, establish protocols and facilities requirements for implementing cold curation and cold sample processing, perform a study to determine facilities requirements for samples under BSL-4 to prepare for sample return from PP Class V objects, and establish new compendia when a need is identified by scientific community.

There was discussion about preparing for cold storage of extraterrestrial materials. All curational facilities (including the White Sands Test Facility) would have the same conditions, and proposers who ask for samples that require cold storage must demonstrate that they can keep samples cold when they request samples for study. These requirements for PIs would be developed with CAPTEM.

9. Lunar samples allocation/curatorial report (Zeigler)

Update on Apollo Sample Bag

The issue has been resolved. The bag that held the first Apollo sample was bought through an auction from the US Government. The buyer was able to keep sample bag because it was ruled in court that the rights as the buyer outweighed those of NASA.

Apollo sample display in Germany

A pristine triangular glass display was broken during installation and the lunar sample was exposed to air. The sample is now off display and in a safe. These types of displays cannot be made anymore

because the vendor can no longer make them. Zeigler is actively looking for another vendor to create pristine displays.

Facilities update

There was a water leak on September 15th 2016 of a water line to supply chiller. This flooded the thin section lab, the gun lab, and the micro XCT lab (though the instrument was not in there yet). There was no sample damage, but there was significant damage to labs. Cabinets were removed and everything in the micro XCT lab was cleaned. The thin section lab was gutted. A new thin section lab is expected this spring.

The Cosmic Dust lab also had a leak, and Jeremy Kent reported on rust contamination in the lab at LPSC. He found Fe-oxides and oxyhydroxides.

Lessons learned: leak detection will be installed and there will be more routine maintenance.

The micro-XCT lab has been partially installed. It was an all-day installation, and the instrument sits on top of a few inches of stainless steel. Three of four sources are running. Preliminary scans on terrestrial rocks have been done. In the late summer 2017, Apollo and meteorite samples will be measured. Zeigler is still working on how to distribute the data on Apollo samples to the community. On the short term, these data will be available by request. Announcements of new scans will be made in the semi-annual newsletter. Data will have to be transferred by the large file transfer system.

Harassment of committee members and how to respond

In January 2017, multiple lunar CAPTEM members were contacted by the same individual in a harassing manner. If committee members are contacted by people in a harassing manner in the future, be polite, but don't give out too much information. We are obligated to respond. If you are contacted from this person in particular, point him towards Zeigler.

Allocation report

206 Apollo samples have been allocated (140 thin sections, 66 samples – chips, fines, etc.), and 299 returned samples have been processed. There is a downward trend in new PIs, but an increase in foreign PIs since spring 2013. There is no thin section lab activity because of the flooding.

Public website updates

Apollo public websites were updated: curator.jsc.nasa.gov/lunar/references includes papers that report on each sample.

The Sample Catalog includes microscope images, photos, and .tifs that are on PDS.

It is difficult to find the search page, so here it is: <https://curator.jsc.nasa.gov/lunar/references/#>

Ryan thanked Larry Nyquist and Dimitri Papanastassiou for all of their service to the lunar samples!

10. MWG allocation/curatorial report (Righter)

788 samples of Antarctic meteorites were allocated to 79 investigators. 219 + 180 new meteorites (2012, 2013, 2014, 2015 seasons) were published in the fall 2016 and spring 2017 newsletters.

Jim Karner reported on the shortened ANSMET field season this year. The season was descoped from eight to six people, and the field site was changed from Shackleton Glacier to Elephant Moraine (EET). There were issues with weather and fuel, and deployment was delayed, resulting in a 2-week season.

2016-2017 ANSMET samples will be arriving at JSC in late March (~220 samples from EET).

Webpage updates

60 papers from 2016 were added to the bibliography, the new PI Guidebook was uploaded, the collection spreadsheet was updated, and webpage content and organization was updated.

Educational samples

Since October 2016, disks were sent out 169 times, meteorite hand samples went out 13 times, meteorite display samples went out 28 times, and college disks and thin sections went out 6 times.

New instrument

A new microprobe was just delivered to Cari Corrigan. A new stage motor is on the way, and the instrument is close to being up and running.

Updates to Subcommittee

Alexander Conel is due to rotate off soon, so a new chair is needed. MWG has discussed a new chair, and potential chairs will be brought to McKeegan during this meeting.

O-REx Sample Return Mission

A complete materials archive collection will be assembled at JSC from March 2015 through and after launch, for contamination knowledge. 395 materials have been archived so far. Most items are made of Al, epoxy, or steel. The archive also includes witness plates. One of each witness plates was immediately analyzed and the rest were archived. These samples are in the previous Space Exposed Hardware Lab (now the MIC lab).

Curation facilities for O-REx and Hayabusa-2 samples are currently being designed. They are both Iso 5 cleanrooms and will be designed at same time. Construction will begin in 2019 (near the time of sample collection) and will be completed ~1 year before samples arrive.

Coordinated analysis training (Draper)

LPI and ARES collaborated on training of coordinated analysis. Four early career scientists came to JSC and focused on handling very small samples to teach techniques developed at JSC. This will likely be a continuing training opportunity on an ~annual basis. Draper welcomed input from CAPTEM on what to focus on.

11. Subcommittee chair reports

In addition to the allocation functions under CAPTEM, McKeegan encourages Subcommittee chairs and members to become active in the planning functions. Communicate as a group, talk to the community, and think about the future of sample curation and allocation.

Stardust (Stroud)

Rhonda Stroud has taken over as chair for Andrew Westphal. Andrew is still serving on the Subcommittee. Andy Davis is going to rotate off, so Ryan ~~Ogliori~~ (Ogliore (Washington University)) is now on the Subcommittee. The Stardust Subcommittee is looking to rotate more regularly to replace older members.

There has been a drop off in sample requests over last few years, perhaps because of frustrations with the process (Ex: one frustration in the community is that PIs can only have so many samples). The Subcommittee is currently reviewing requests on a rolling basis, and it may do this on 6 month timeline to speed up sample requests. Over the next 6 months, the Subcommittee will do a formal review to characterize community frustrations and update the process for allocating samples to the community.

Cosmic Dust (Iishi)

Four Cosmic Dust requests and 30 particles have been allocated over the last year. Incoming Subcommittee members include Susan Taylor, Penelope Wozniakiewicz, and Zahi Djouadi-Bouali. Outgoing Subcommittee members include Larry Nittler, Matthew Genge, and Giles Graham.

From Mike Zolensky (not present): Flags are only flying from one plane out of Ellington Field, so there are fewer opportunities to collect Cosmic Dust. Kathleen McBride at JSC is learning to microtome.

High Volume Air Sampling Collections: The first collection was collected in 2010 on the US Marshall Islands. Now there are three new collections. One or two will be NASA-curated, at least in part. These collection include Halley VI Research Station CASlab (CAS = clean air sector, collected in 2012), NOAA's Mauna Loa Observatory (2016), and South Pole Station (2016).

Publicity and outreach to high schools to teach students how to identify Cosmic Dust materials would be beneficial.

Cosmic Dust is not yet curated at the White Sands Test Facility, but there are cabinets there for curating Cosmic Dust. Some samples will go to White Sands in Fall 2017. Iishi and Zeigler will discuss long-term offsite storage for Cosmic Dust.

Asteroids (Humayun)

Subcommittee members have changed, and Keller and Cook are new members. There have been no requests for allocations over the last 6 months. No new materials have been sent to NASA from JAXA, but NASA is expecting more. 25 particles are curated at JSC currently.

Genesis (Allton, Nittler)

Larry Nittler is the new Subcommittee chair. Allocations from November 2016 through March 8th 2017 include 21 Genesis-flown samples to three PIs and eight reference pieces to two PIs. Eight of 20 PIs have returned inventories. 4396 samples are at JSC, 55 at White Sands, and 234 are with investigators.

A Genesis Solar Wind Sample Analysis and Techniques Workshop was held the Sunday before LPSC.

Re-processed ACE data demonstrated the first-ever observation of mass dependent fractionation (elemental), which provides motivation for new science with Genesis samples.

The CME in October 2003 resulted in the highest measured proton speeds.

Laser scribing capability is on hold since the micro-XCT was installed. It is in storage and not currently operational, but manual inscription is possible.

There are 417 entries in the bibliography as of December 2016, including 124 peer-reviewed publications, 248 LPSC abstracts, four PhD dissertations, one masters thesis, 15 US Government NASA Genesis reports, six Utah Test Range soil reports, and four Genesis Lab Biological tests.

New allocations include regime samples. Samples from regime arrays appear less damaged than others.

A suggested update to the Genesis compendium of science results is to include successful methods of analysis as an aid to the review Subcommittee as well as community at large. A suggested update to the Genesis materials compendium is to capture information from the original science team on collector history and characteristics.

Need to find a new Subcommittee member to replace Dimitri Papanastassiou.

Informatics (Lawrence)

Subcommittee members include Sam Lawrence, Jeff Taylor, Andy Westphal (for one more yr), Dave Joswiak, Larry Nittler, Justin Hagerty, and Tim McCoy. The preliminary astromaterials catalog assessment has been completed. The PDS roadmap effort is underway, and ARES submitted an official response to the request for information. An important question for the Informatics Subcommittee to address is, how can geochemical data be most effectively archived and communicated? There was discussion about MoonDB and whether it would be useful to create a “MarsDB” and/or a “MeteoriteDB.” The Informatics Subcommittee will continue to assess the online catalogs. There was additional discussion about data management and aiding the community in developing Data Management Plans for grant proposals. Developing DMPs can be a struggle because different members of the community want different types of data archived (Ex: a geochemist would value different datasets than a spectroscopist or a modeler). It was decided that a survey will be generated to identify the community standards for reporting results from extraterrestrial materials.

12. Other activities

Planetary Science Vision 2050 Workshop

The floor was opened for comments from those who attended the workshop at the end of February in Washington, DC. Allan Treiman talked about sample return at the workshop and the technology improvements necessary (i.e., better sample collection mechanisms and delta V to get to and from locations). There were many talks on sample return and a white paper from CAPTEM (Planetary Science in the Next Decades: The Astromaterials Perspective). Larry Nittler is on the science organization committee of the workshop will include sample return in the report. The entire workshop was recorded and is on LPI website.

Sample Analysis Future Investment Strategy report

Dr. Abby Sheffer (program officer on Space Studies Board) is gathering info from the community on extraterrestrial analytical facilities. She will ask CAPTEM for formal involvement, and is assembling a committee now to make findings. McKeegan asked the CAPTEM members to keep everyone informed if anyone hears from Sheffer. There may be some problems with conflict of interest with NASA, and if so, this will have to be addressed.

Decadal midterm

There will be a meeting in May regarding a midterm of the Decadal Survey. Guidance from CAPTEM will be necessary.

Facilities contact person

The duties of the facilities contact person include interfacing with Lisa Pace about science priorities, requirements for instruments and laboratories, procedures in laboratories, and updates to laboratories. McKeegan volunteered and will delegate specific questions to other CAPTEM members.

New Chair for MWG

The MWG put forward four candidates that were discussed by the broader CAPTEM members. CAPTEM members ranked the order of the candidates and voted on the ranking. It passed unanimously by a show of hands. McKeegan will work with McCubbin and Righter to select the new MWG Chair.

13. New items/Futurisms/Planning from the Chair*Space hardware Subcommittee*

Jeff Taylor is the Chair of Space Hardware Subcommittee. It is only activated whenever there is a request, and a request is expected soon. Mike Zolensky recruited two members to serve on the Subcommittee, Don Brownlee and Fred Horz.

Need for science bullets/nuggets

If a significant finding is made regarding sample science, send the finding to McKeegan and he will disseminate them to the community. Sam Lawrence would like the same for lunar sample science. McKeegan requested a single PowerPoint slide describing the highlights of the finding with a reference. Grossman asked for a science nugget from each major collection to add to the Congressional justification of the budget. Grossman asked for these before each spring meeting. These will also be shared with the PAC.

*Other initiatives/workshops*50th anniversary of Apollo sample return

We are 2+ years from the 50th anniversary of the return of the first Apollo samples. This will be a big national celebration and CAPTEM should be involved. The celebration should highlight what we have learned from the samples and what we can learn in the future. We discussed ideas for this celebration, including special sessions at appropriate meetings, archiving stories from people who were at JSC when the samples arrived, meeting with Apollo astronauts, and asking John Wood to make a commemorative painting. Judy Allton and Andrea Mosie already have oral histories from some people though the Historical Astronomy Division of AAS that could be shared. Kevin asked CAPTEM members to talk to the community and gather ideas. He will set up a Google Doc to record these ideas.

Microanalysis Society 50th anniversary

This year is the Microanalysis Society's 50th anniversary. A special session on the history of NASA in analysis equipment may be appropriate at a major conference.

Spring 2018 CAPTEM meeting

Zeigler proposed we have the 2018 spring CAPTEM meeting the Saturday before LPSC in The Woodlands. It would interfere with the Brown Vernadsky Microsymposium and it may conflict with a Genesis workshop. McKeegan will talk to the LPSC meeting organizers to see if there are auxiliary rooms available and will investigate costs. There was a consensus to pursue changing the 2018 spring CAPTEM meeting to the Saturday before LPSC in The Woodlands.

Virtual Fall 2017 CAPTEM meeting

McKeegan will set up and distribute a Doodle poll for scheduling the virtual fall 2017 CAPTEM meeting. There are quite a few meetings in the fall to avoid (e.g., GSA annual meeting and O-REx science team meeting).

14. Summary of action items (Rampe)

- (1) CAPTEM will continue to anticipate working with NASA Headquarters on developing an investment strategy for needed future analytical capabilities and facilities, following delivery of the NRC study. NAS will be performing a similar study. Distribute announcement of NAS meetings within CAPTEM so that members can read minutes from meetings.
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(8) Identify the community standards for reporting results from extraterrestrial materials by surveying the community (Informatics Subcommittee, Treiman, Zellner, Gross, with Grossman as an advisor).

(9) Contribute ideas to celebrate 50th Anniversary of Apollo samples to the Google Doc that will be set up by McKeegan.

(10) Investigate costs and logistics associated with changing the spring 2017 CAPTEM meeting to the Saturday before LPSC (McKeegan).

(11) Find a date for virtual fall meeting.

Adjourn.