# Apollo Laboratory Report

Spring 2016 CAPTEM meeting

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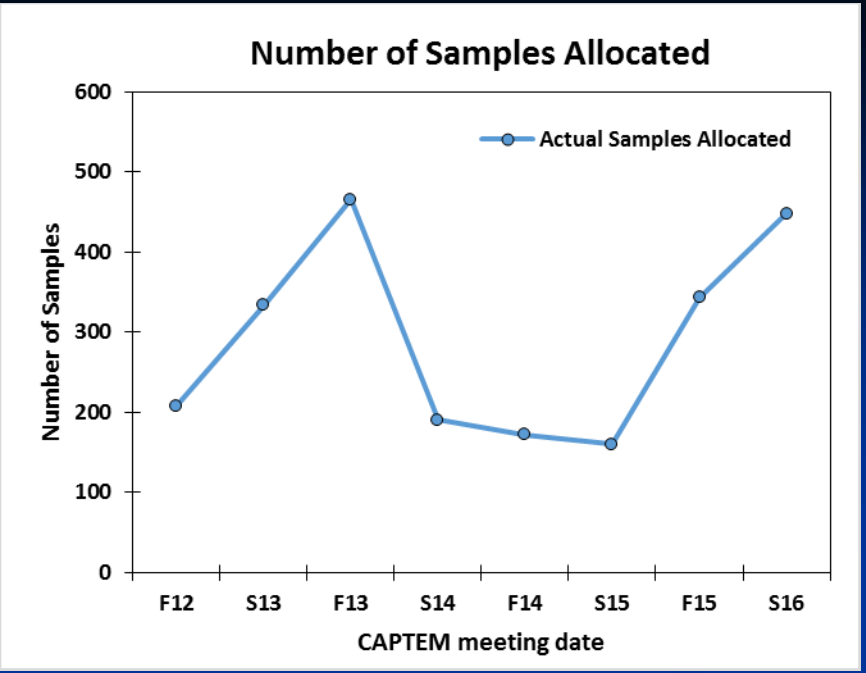
Apollo Sample Curator

# Allocations

- Since 10/1/2015, we have allocated the following:
  - 448 Apollo Samples sent to PIs
    - 182 Thin Sections
    - 138 Samples (chips, fines, etc.)
    - 128 Samples studied internally*
  - 66 additional samples complete, waiting to be mailed >LPSC

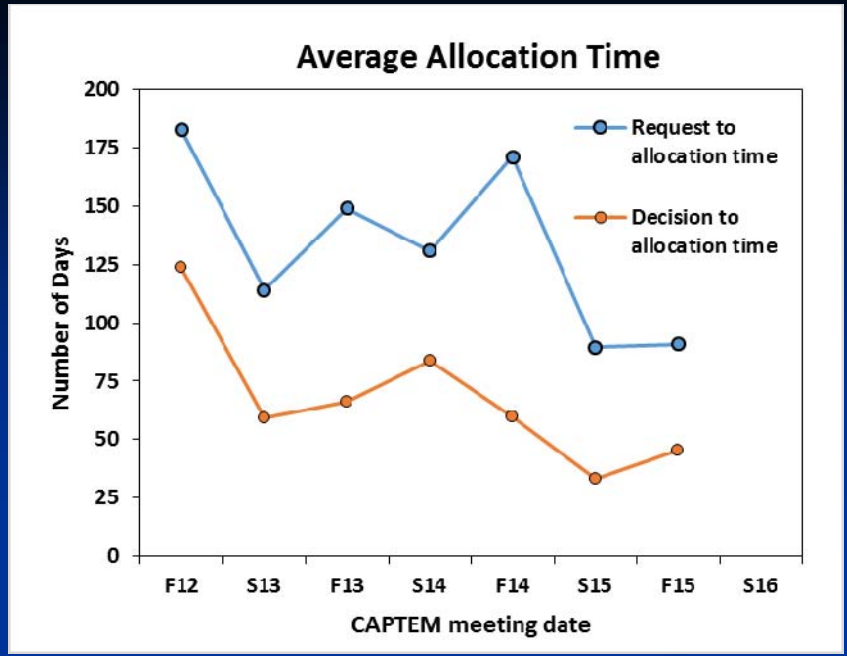
*Analyses for CAPTEM approved studies done at JSC now counted as allocations.

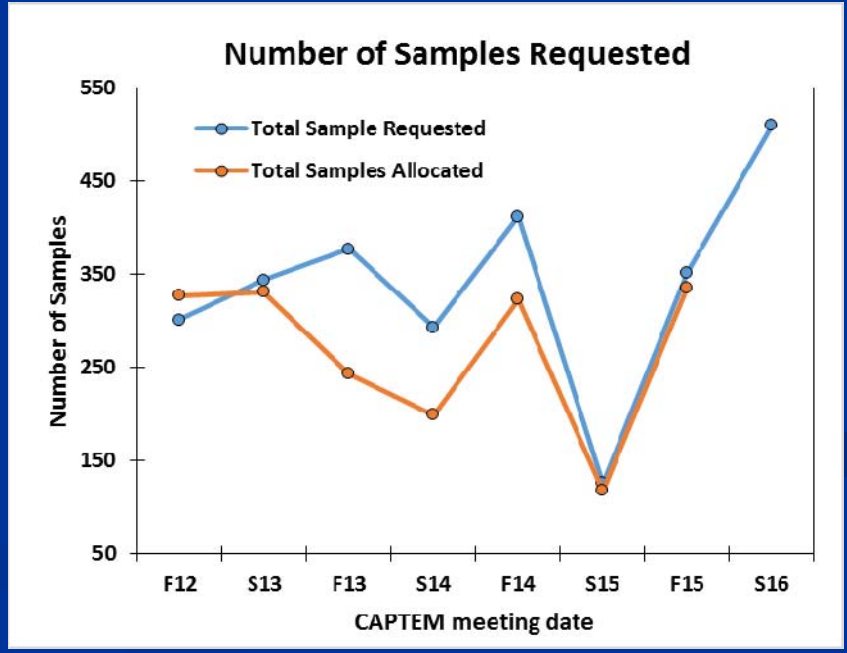
- PI visits – 4 visits, 13 days
  - Gattacecca (6); Weiss (4); Hirschmann (2); Schmitt (1)
- Thin Section Lab activity
  - 10 TS made; 131 TS cleaned; 14 TS repaired; 1 TS rounded




# Sample Requests

- All Fall 2015 CAPTEM requests (30) are complete
  - Two Spring 2015 requests are still awaiting PI action.
  - 100% sample allocation; average allocation time was 45 (91) days
- All Spring 2016 curatorial requests not needing PI action (9) are complete.
- 18 sample requests considered by the LSS for Spring 2016.
  - 6 passed, 9 passed with modifications; 3 were denied
  - 535 samples were requested, ~336 were approved.



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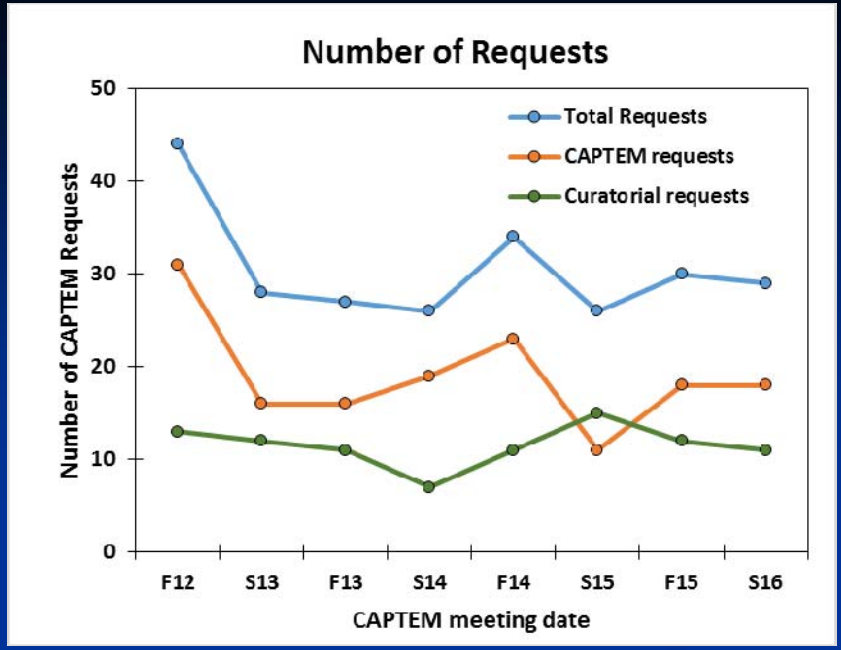


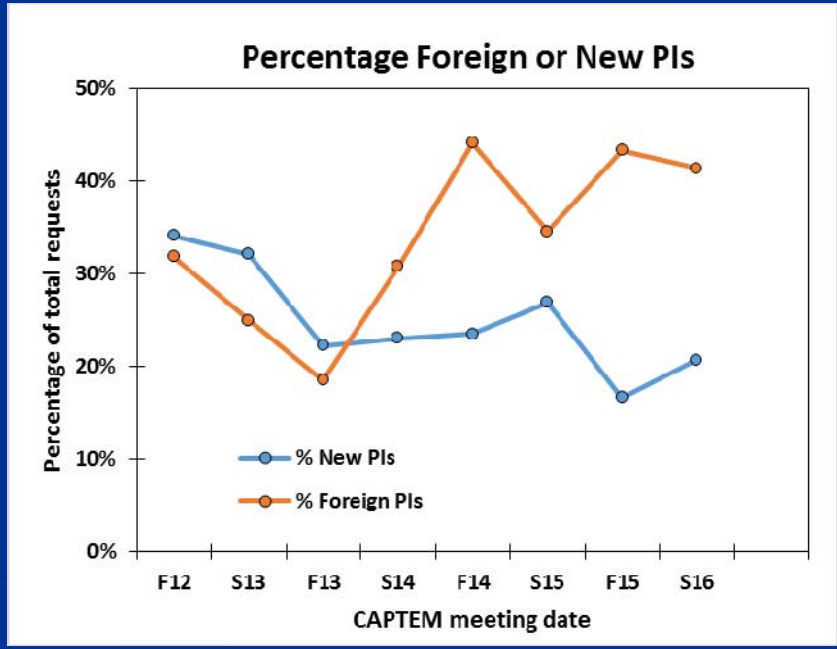

# Returned Samples

- Since 10/01/2015, over 1300 Apollo samples have been returned by PIs.
- Since 10/01/2015, we have processed 559 samples back in to the collection .
- Overall, we have 3500 samples to process in, 2000 of which are not checked in yet
  - Includes several large return sample collections from: Warren (350), Papanastassiou (400), Pillinger (100), Korotev (500), Clayton (100), and Walker (600).

# Outreach

- Lunar Thin Section Sets + Education Disk Program
  - 18 TS sets; 194 disks to K-12
- Lunar lab has hosted 68 tours for 384 people (88 inside lab)
  - Students/Interns/Teachers
  - Astronauts/Cosmonauts;
  - NASA HQ (CFO, CIO, OCC);
  - Captains of Industry
  - Congressional aides (Babin/Olson)
- Media Events
  - 3 film crews, including ABC
  - 2 radio/Skype interviews
  - Dr. Jill Biden (almost)
  - Ars Technica Article
- Suspected Lunar Samples (aka Dream Crushing) – 5 times.

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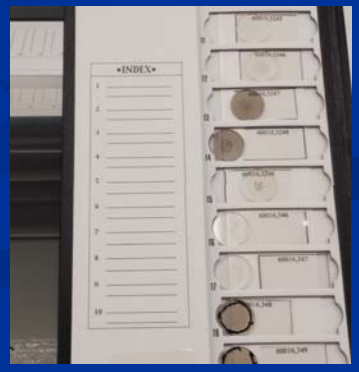
# Inventories and Loan Agreements

- All 122 lunar PIs are current on their loan agreements.
- The 2015 Lunar Sample Inventory was sent out to 98 external (to JSC) lunar PIs.
  - 100% compliance was (eventually) achieved.
- An additional 13 external PIs were exempt; either too new or too old (they chose to return samples instead).
- The 11 JSC lunar sample PIs had to do their inventory with JSC security (lots of fun).
- This summer will be the semi-annual JSC Curation lunar sample location inventory with JSC security.

# Thin Section Reorg

- Currently lunar thin sections are stored in the lunar vault in a variety of locations/containers.
  - Ideally all would be centralized.
- We recently built 20 new thin section cases, giving us capacity for 18,000 sections, plus >3,000 more in SCC
- There are currently ~15,500 flagged sections; >3,000 are in SCC
  - Great, this all fits no problem!
- Sadly, sections that predate our digital data base are not flagged
  - Represent another ~8,000 thin sections
  - The reason for the ~ is that many samples are polybag multiples (~4000 sections).
- Goal is to have everything rearranged by the Fall CAPTEM meeting
  - Photographs by next Spring



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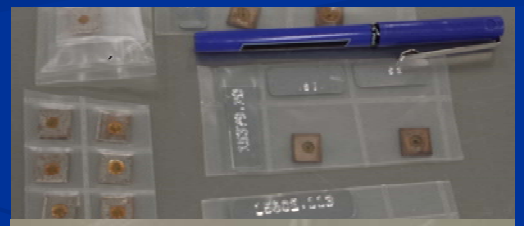


# Apollo Public Websites

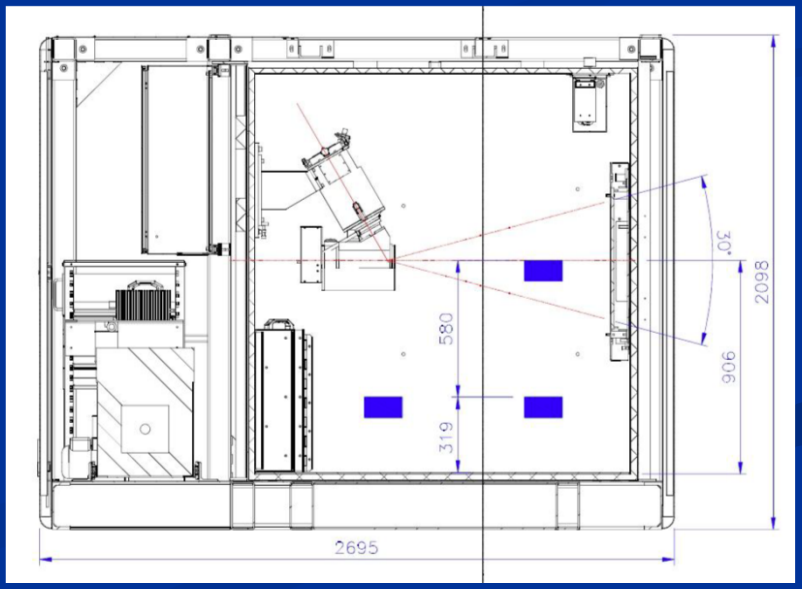
- Complete migration of Lunar Sample and Photo Catalog to a non-flash dependent website
  - Revamped Search Interface - More intuitive
  - List of available thin sections are included
  - Easier to limit photo searches, rotate images, report problems
  - Much Faster!
- Data, Photos, and references for the cores/drive tubes has been added to the website.
- Many new catalogs are online (or coming soon):
  - Catalog of Apollo Lunar Surface Geological Sampling Tools and Containers (JSC-23454 – March 1989 – Allton)
  - Apollo 12 Lunar Sample Information Catalog ( NASA TR R-353–Dec 1970 – Warner)
  - Table of Sample Depths for Apollo 15, 16, and 17 Drill Cores (Pub. 56 – March 1981 – Allton, Waltz, Dardano)
  - Drive Tubes 74002/74001 (January 1978 – Nagle)
  - Description of Core Samples Returned by Apollo 12 (NASA TM-X-58066 – Nov 1971 – Lindsey, Heiken, and Fryxell)
- We had all Apollo Sample History forms (F-75s) scanned
  - We now have 45,953 PDF files (90.4 GB) available internally

# MoonDB

- MoonDB is a quality-controlled data system to preserve, digitize, and curate lunar geochemical and petrological data and associated sample metadata and analytical metadata.
  - Project lead by Kerstin Lehnert of IEDA (at Lamont Doherty); funded through NASA's PDART program.
  - JSC curation is providing sample numbers, sample collection/processing metadata, and sample lithologies.
- Data from the first ~400 references has been ingested, many more to come (using lunar compendia as ref. source)
- Also working with lunar PIs to get unpublished (but vetted) data to be included as well.
- Data interface is under construction; PetDB is the template
- There will be a workshop and poster during LPSC:
  - Sunday meeting – 11:00-12:30, in The Woodlands Room
  - Yue Cai et al., Abstract #2738, Thursday evening poster session

# Micro-CT Lab

- We purchased a Nikon XTH 320 micro-CT system.
  - 4 interchangeable x-ray sources (180 kV, 225 kV, 225 kV rotating, 320 kV)
  - A 2000 pixel, 16-bit detector
  - Ability to handle large samples (100 kg, 300 mm diameter)
  - Bit of a monster (8000 kg, 9' x 7' x 6')
- The large lunar thin section lab will be renovated to house it.
- Timeline of the instrument
  - Demolition – March-April 2016
  - New construction – April-May 2016
  - Casework installed – June 2016
  - Hire a technician – July/August 2016
  - Instrument arrival – August 2016
  - System acceptance – September 2016
  - Data produced – Fall CAPTEM

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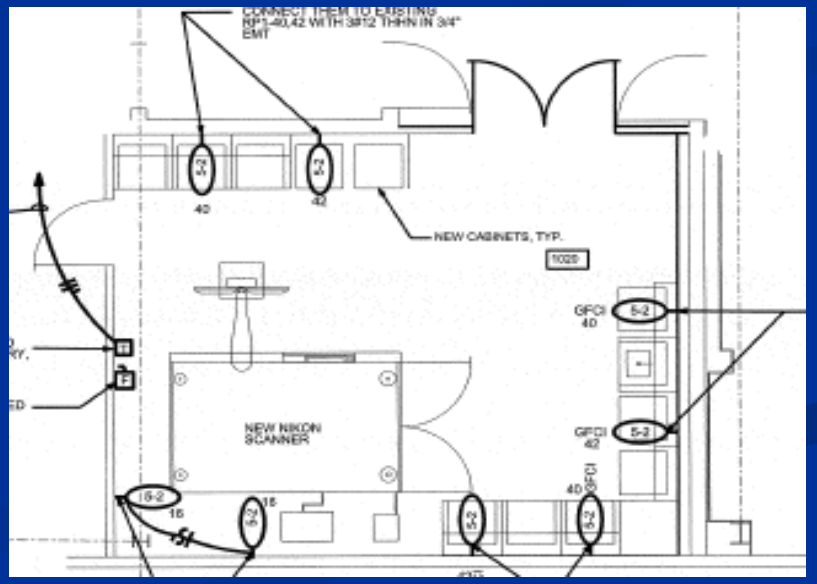

# Summary

Priorities for the next 6 months

1. Complete all new allocations (336 samples)
2. Clear two "old" allocations (need PI feedback)
3. Reorganize the thin sections into the new cases.
4. Bring the new micro-CT laboratory online and begin to produce data.
5. The JSC bi-annual lunar sample location inventory
6. Make inroads into processing return samples, especially large return collections
7. Figure out how to fill time after May…