EXPLORE
SOLAR SYSTEM & BEYOND

Dr. Stephen Rinehart
Director, Planetary Research Programs

PAC Meeting
June 21, 2022
ROSES-21 is nearly complete

• Remaining programs:
  • OREx-PSP

• The general drop in proposal pressure was also seen for LDAP (since the PAC in February)

• First year of NoDD is nearly complete (more on that later)
<table>
<thead>
<tr>
<th>Planetary Science Division ROSES 21 Program</th>
<th>Step-1 Due Date</th>
<th>Step-2 Due Date</th>
<th>Panels Held</th>
<th>Selections/Proposals</th>
<th>Selection Dates</th>
<th>Days from Step-2 to Select</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planetary Protection Research</td>
<td>04/12/2021</td>
<td>05/13/2021</td>
<td>Yes</td>
<td>5/10 (50%)</td>
<td>10/15/2021</td>
<td>155</td>
</tr>
<tr>
<td>Exoplanets Research Program</td>
<td>04/02/2021</td>
<td>05/27/2021</td>
<td>Yes</td>
<td>22/183 (12%)</td>
<td>10/6/2021</td>
<td>132</td>
</tr>
<tr>
<td>Development and Advancement of Lunar Instrumentation</td>
<td>04/16/2021</td>
<td>06/16/2021</td>
<td>Yes</td>
<td>5/44 (11%)</td>
<td>1/21/2022</td>
<td>219</td>
</tr>
<tr>
<td>Yearly Opportunities for Research in Planetary Defense</td>
<td>04/22/2021</td>
<td>06/17/2021</td>
<td>Yes</td>
<td>12/23 (52%)</td>
<td>10/19/2021</td>
<td>124</td>
</tr>
<tr>
<td>Cassini Data Analysis Program¹</td>
<td>05/07/2021</td>
<td>07/09/2021</td>
<td>Yes</td>
<td>15/38 (39%)</td>
<td>10/8/2021</td>
<td>92</td>
</tr>
<tr>
<td>Hot Operating Temperature Technology</td>
<td>06/01/2021</td>
<td>08/03/2021</td>
<td>Yes</td>
<td>7/38 (18%)</td>
<td>11/12/2021</td>
<td>101</td>
</tr>
<tr>
<td>Juno Participating Scientist Program</td>
<td>06/14/2021</td>
<td>08/13/2021</td>
<td>Yes</td>
<td>10/27 (37%)</td>
<td>11/12/2021</td>
<td>91</td>
</tr>
<tr>
<td>VIPER Mission Co-Investigator Program</td>
<td>07/02/2021</td>
<td>08/31/2021</td>
<td>Yes</td>
<td>8/50 (16%)</td>
<td>12/21/2021</td>
<td>112</td>
</tr>
<tr>
<td>Planetary Science and Technology Through Analog Research</td>
<td>07/23/2021</td>
<td>10/07/2021</td>
<td>Yes</td>
<td>xx/49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Frontiers Data Analysis Program¹</td>
<td>09/03/2021</td>
<td>11/04/2021</td>
<td>Yes</td>
<td>7/21 (33%)</td>
<td>1/24/2022</td>
<td>81</td>
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<tr>
<td>Mars Science Laboratory Participating Scientist Program¹</td>
<td>09/15/2021</td>
<td>11/05/2021</td>
<td>Yes</td>
<td>25/50 (50%)</td>
<td>1/21/2022</td>
<td>77</td>
</tr>
<tr>
<td>Mars Data Analysis¹</td>
<td>09/24/2021</td>
<td>11/18/2021</td>
<td>Yes</td>
<td>20/66 (30%)</td>
<td>5/10/2022</td>
<td>173</td>
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<tr>
<td>Discovery Data Analysis¹</td>
<td>09/28/2021</td>
<td>11/23/2021</td>
<td>Yes</td>
<td>9/31 (29%)</td>
<td>3/26/2022</td>
<td>107</td>
</tr>
<tr>
<td>Planetary Science Early Career Award</td>
<td>N/A</td>
<td>12/08/2021</td>
<td>Yes</td>
<td>5/27 (19%)</td>
<td>4/17/2022</td>
<td>130</td>
</tr>
<tr>
<td>Payloads and Research Investigations on the Surface of the Moon</td>
<td>12/01/2021</td>
<td>02/24/2022</td>
<td>Yes</td>
<td>2/29 (7%)</td>
<td>6/7/2022</td>
<td>169</td>
</tr>
<tr>
<td>Lunar Data Analysis¹</td>
<td>N/A</td>
<td>12/20/2021</td>
<td>Yes</td>
<td>7/35 (20%)</td>
<td>6/16/2022</td>
<td>112</td>
</tr>
<tr>
<td>Martian Moons eXploration Participating Scientist Program</td>
<td>MOVING TO ROSES-22</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future Investigators in NASA Earth and Space Science and Technology</td>
<td>N/A</td>
<td>02/11/2022</td>
<td>Yes</td>
<td>32/230 (14%)</td>
<td>6/15/2022</td>
<td>124</td>
</tr>
<tr>
<td>OSIRIS-REx Sample Analysis Participating Scientist Program</td>
<td>N/A</td>
<td>04/26/2022</td>
<td>Yes</td>
<td>xx/58</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Highlighted in Yellow = Cross-Divisional
Not solicited this year: MatISSE, ICAR, Habitable Worlds

1: DAPR Program
Proposal pressure

Not much new data, but the reduction in proposal pressure appears to be continuing:

• LDAP proposal pressure down significantly
• XPR proposal pressure flat

Program Officers are also reporting that it is becoming more difficult to recruit reviewers

• Are these things correlated?
FINESST

Selections for FINESST21 are well distributed, based on proposal topic

The percentage of female students has steadily increased from 2019 to 2022 to nearly parity this year

• Female PIs also increased, but up to ~30%

Unified FINESST funding within the R&A Portfolio this year

• DAPs (mission lines) still fund their own awards

Gender inferred from first name at 90% confidence from https://gender-api.com
Spike in March as ROSES-21 closed out

Current look-back

Received ~30% of the proposals we might have normally expected.
NoDD programs

We will be reporting NoDD statistics, in general, for the past year.

<table>
<thead>
<tr>
<th>Program</th>
<th>Total ROSES21-22</th>
<th>Within the Last Year</th>
<th>Proposals 5-12 months old</th>
<th>#props in 270 days prior to 2/1/22</th>
<th># of these notified</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.2 EW</td>
<td>38</td>
<td>16</td>
<td>0</td>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td>C.3 SSW</td>
<td>91</td>
<td>59</td>
<td>0</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>C.4 PDAR</td>
<td>54</td>
<td>37</td>
<td>2</td>
<td>26</td>
<td>14</td>
</tr>
<tr>
<td>C.5 EXO</td>
<td>65</td>
<td>23</td>
<td>1</td>
<td>38</td>
<td>41</td>
</tr>
<tr>
<td>C.6 SSO</td>
<td>19</td>
<td>12</td>
<td>2</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>C.12 PICASSO</td>
<td>23</td>
<td>13</td>
<td>0</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>C.16 LARS</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Notes:
Selection rates are good!
Proposals are still meeting high standards.
It is taking us too long to get proposals reviewed and notified But we’re getting better!
Beginning: some proposals languished while we waited for additional proposals

Now: Time to notification is improving. Goals: 50% of PIs notified in <150 days; 90% in <235 days. (Target is 80% within 180 days)
NoDD: Informal Feedback after 1 year

Community Feedback:
The majority of feedback from the community has been very positive

Program Officer Feedback:
NoDD is more work

Concerns:
Low proposal pressure
Time to notification

Reminder: We decided to do a three-year trial of NoDD, and we knew that the first year would be the toughest as everything transitions.
No-Budget Experiment with DDAP

DDAP did a “no budget” experiment this year:

• Proposers were only asked to identify their proposal as “small”, “medium”, or “large”

• Work effort tables still required, justification for major expenses still required, but detailed institutionally-approved budgets not required

• Successful!
  • No evidence for “gaming” of the size boundaries
  • No evidence of bias in scoring based on proposal size
  • Budgets coming in low enough that additional selections may be possible
  • Very positive feedback from proposers

<table>
<thead>
<tr>
<th></th>
<th>FY21</th>
<th>FY22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>&lt;$75k</td>
<td>&lt;$125k</td>
</tr>
<tr>
<td>Medium</td>
<td>&lt;$175k</td>
<td>&lt;$175k</td>
</tr>
<tr>
<td>Large</td>
<td>&lt;$300k</td>
<td>&lt;$300k</td>
</tr>
</tbody>
</table>
DAPR Status for PSD

**Completed:**

- Habitable Worlds (ROSES-2020)
- Exoplanet Research Program (ROSES-2021)
- Five Data Analysis Programs (DAPs; Cassini, Discovery, Lunar, New Frontiers, and Mars; ROSES-2021)
- Mars Science Laboratory Participating Scientist Program (MSL PSP; ROSES-2021)

**In-progress/ Future:**

- OSIRIS-REx (ROSES-2021)
- Habitable Works, Exoplanet Research Program, MMX-PSP, and five DAPS (ROSES-2022)

DAPR Status for SMD

- A dedicated SMD-wide DAPR lead is in the process of being identified.
- DAPR will become standard practice for SMD reviews in the future, with an opt-out option. SMD is currently bolstering technical capabilities in order to facilitate this expansion of DAPR.
DAPR Success Metrics

Most programs continue to have high levels of compliance, but some recent solicitation responses have had higher levels of non-compliance. 2nd iterations show clear improvement!

Q: Would an additional DAPR Town Hall(s) for PSD be welcome?

Only 2% of respondents responded negatively about the quality of the peer review under DAPR and whether it should be for the program being reviewed in the future. [>83% positive]

The Dual-Anonymous Peer Review process led to panel discussions being focused on the science rather than on the identities of the team members.

Data is still being collected from reviews in the last several months. A comprehensive study from the DAAR is forthcoming.
FY21 Budget

RESEARCH BUDGETS OVER TIME

- New Lunar Programs
- Outer Planets
- International Missions PSPs
- New Frontiers
- Mars
- Discovery
- R&A from other sources
- PSD R&A
FY22 Budget

Repeat of slide from last PAC

R&A lives here, along with AMMOS, PDS, etc.

Enacted FY22 budget is $79.6M less than the PBR

Awaiting approval of operating plan

R&A Protected!
Reminders on ROSES 22

• Continuations from ROSES21
  • No-Budget experiment with DDAP
  • Dual-Anonymous Peer Review for all Data Analysis Programs (DAPs)
  • No Due Date (NoDD) programs (open now!)
    • https://science.nasa.gov/researchers/NoDD

• Remember rules on duplicate proposals (see C.1)

• Compliance: We are checking and strictly enforcing compliance rules. Non-compliant proposals may be returned without review or be declined on this basis regardless of intrinsic merit score from the panel.
  • Please remember, compliance rules exist in part to ensure readability and accessibility.
ROSES22: Some changes

• PMEF turning into PSEF (as already mentioned)
• Some calls to watch for:
  • Apollo Next Generation Sample Analysis 2 (ANGSA-2)
  • Analog Activities to Support Artemis Lunar Operations
  • Artemis III Geology Team
  • Martian Moons eXploration (MMX) PSP
  • Preparatory Science Investigations for Europa
• PDART: under ROSES22, PDAR will not accept any proposals for
development or validation of tools
  • Reason: The Planetary Data Ecosystem review highlighted some
    weaknesses in how tools are developed and supported. We need to
    change how this is done moving forward.
Talking about Money: Definitions

We are continuing work to improve transparency in the R&A budget. As part of this, introducing two definitions:

• The Planetary R&A Portfolio (R&A): This includes all activities funded under the R&A budget line.

• The Planetary Research Program (PRP): This includes all research activities
  • Includes activities funded under R&A and those funded through mission lines
  • Includes both openly-competed and closed-competition research
A Word about “Openly-Competed”

PSD defines a program as openly-competed if it is announced publicly and available for proposals.

- An openly-competed program **may** have restrictions on who can apply
  - Early Career Awards have strict eligibility requirements
  - A call could have a stated preference for awards from particular institutional types (e.g. MSIs)
- What is not “openly-competed”?
  - Work that is directly funded at the Centers (e.g. ISFM)s
Planetary R&A Portfolio

<table>
<thead>
<tr>
<th>Core</th>
<th>Astrobiology</th>
<th>Technology</th>
<th>Directed (incl. ISFM)</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exoplanet Research Program</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratory Analysis of Returned Samples</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Lunar Data Analysis Program</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar System Observations</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>R&amp;A Discretionary Activities**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planetary Major Equipment ANGSA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planetary Science Enabling Facilities SSERVI***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early Career Award Citizen Science FINESST****</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Data Science Initiatives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>These programs are all part of the Planetary Research Program as defined on the next slide.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openly-competeted</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not openly-competeted</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not included in the PRP</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

All programs in the R&A Portfolio budget line are included here if they have funding in FY22 or beyond

*: NAI has residual funding on tasks into FY23 but not beyond

**: Discretionary Activities support research activities that do not fit into other programs

***: SSERVI is bookkept under JRPA (Joint Robotics Program for Exploration)

****: FINESST is funded from both R&A and from mission lines
A Snapshot of the Planetary R&A Portfolio

Breakdown of Research funding in 811073 (2022)

- Reserves: 1.4% (Allocated to programs over the course of the year to meet unexpected needs)
- Support: 13.5%
- SSERVI: 4.8%
- Facilities: 2.5%
- Directed: 9.9%
- Technology: 6.7%
- Astrobiology: 22.8%
- Core: 38.4%

The fraction of the budget that goes to support is very low! (Compare it to your institutional overheads!)
## Planetary Research Program

<table>
<thead>
<tr>
<th>Portfolios’ contribution to the Planetary Research Program</th>
<th>From the R&amp;A Portfolio</th>
<th>Core Programs</th>
<th>Astrobiology Programs</th>
<th>Technology Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discovery Program</td>
<td>DDAP</td>
<td>PSPs (InSight, VIPER, Lucy...)</td>
<td>FINESST*</td>
<td>Contributions**</td>
</tr>
<tr>
<td>New Frontiers</td>
<td>NFDAP</td>
<td>PSPs</td>
<td>FINESST*</td>
<td>Contributions**</td>
</tr>
<tr>
<td>Outer Planets and Ocean Worlds</td>
<td>CDAP</td>
<td>Preliminary Science Investigations – Europa (PSI-E)</td>
<td>FINESST*</td>
<td>Contributions**</td>
</tr>
<tr>
<td>Mars Program</td>
<td>MDAP</td>
<td>PSPs</td>
<td></td>
<td></td>
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<tr>
<td>Planetary Defense</td>
<td>YORPD***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESSIO</td>
<td>DALI</td>
<td></td>
<td>Contributions****</td>
<td></td>
</tr>
</tbody>
</table>

*: FINESST funding comes from multiple lines
**: Program lines sometimes contribute to R&A solicitations for specific items
**: YORPD is a mix of activities and may need some additional breakdown
**: ESSIO is planning to expand research funding in coming years, but it is TBD how that will be implemented
A Snapshot of the PRP

Some of the numbers here are estimates

<table>
<thead>
<tr>
<th></th>
<th>Budget</th>
<th>Fraction of PSD Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research (no ISFM)</td>
<td>$222.5M</td>
<td>6.95%</td>
</tr>
<tr>
<td>Research (w/ISFM)</td>
<td>$244.4M</td>
<td>7.64%</td>
</tr>
<tr>
<td>All (incl. support)</td>
<td>$274.2M</td>
<td>8.57%</td>
</tr>
</tbody>
</table>
Some notes on future work:

There is still work to do:

• Some activities are a mix (e.g. Astrobiology Support includes both support activities and openly-competed research). Continuing to try to separate out these activities while maintaining clarity in budget lines.

• IDEA: We want to weave IDEA throughout all of our programs, rather than have IDEA in a silo. Depending on how this is implemented, it could result in mixing of research and non-research activities.
Backup Slides
Reviewers: A little bit of data