Science Productivity Metrics

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SOFIA Users Group #10
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Measuring Productivity

1. Status of GI Projects
   Allows interaction with GIs, assessment of needs, ability to determine corrections to policies

2. Publications
   Measures rate of production of scientific results and their impact.

3. Production split by SI
   Allows assessment of scientific production by instrument to inform decisions related to the instrument suite.
1. Status of Guest Investigator Projects

Each project dispositioned into one of these categories:

- **Published**: refereed journal article using data
- **Ongoing**: will be combined with upcoming observations
- **In preparation**: GI working on draft/plans to write
- **Not reduced**: calibrated data not yet available
- **Incomplete**: less than half of proposed observations complete, or GI indicates cannot publish subset
- **Unpublishable**: GI or SMO believe scientific results will never be obtainable with the acquired data
Basic Science

- Published
- No data
- No status
- Unpublishable
- Incomplete
- Not reduced
- In preparation
- Ongoing
15 “no status”: Did not reply to queries
through Cycle 3

- Published: 47% anticipated published
- In preparation
- Not reduced
- Incomplete
- Unpublishable
- No data
- No status
- Ongoing
Implications of Project Status Study

• About half of SOFIA observations anticipated to be published by the Guest Investigators
  – Opportunity for archival research?
  – 18% deemed unpublishable by Inst Sci, or highly incomplete
  – 14% did not receive data
  – about 15% appear publishable

• Science Center wants to increase publication rate
  – Offering increased support to guest investigators
    • Funding was significantly increased Cycle 4
  – Adding staff to User Support, to enable instrument scientists to remain involved after observations are taken
  – *Suggestions from the SUG are welcome*
2. Publications

- Publication tracking is on our website
  - https://www.sofia.usra.edu/Science/publications
  - https://dcs.sofia.usra.edu/dataRetrieval/SofiaPublications.jsp
  - Allows tracking and linkage to features of Data Cycle System

- Target publications per hour
  - Metric in the SOFIA Outreach Plan: 20 hrs/paper
  - Count all science flights with 8 hrs/flight
  - Through end of 2015: Already at 18.9 hrs/paper
  - Maintaining rate, with 808 RH expect 43 papers from Cycle 4
Publication rate

Cumulative Publications

Projection for 2016 scales to 12 months from actuals as of 10/28/2016
<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Date</th>
<th>Publication</th>
<th>Science Topic</th>
<th>Keywords</th>
<th>Instruments</th>
<th>Program</th>
<th>Data Source</th>
<th>Image</th>
<th>Files</th>
<th>Links</th>
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<tbody>
<tr>
<td>Croiset, B.</td>
<td>Mapping PAH sizes in NGC 7023 with SOFIA</td>
<td>2016-03</td>
<td>Croiset et al. (2016) A&amp;A, 590, 26</td>
<td>Interstellar</td>
<td>FLITECAM FORCAST</td>
<td>02_0056</td>
<td>CYCLE 2</td>
<td></td>
<td></td>
<td></td>
<td>[astro-ph] [ADS] [Teletalk]</td>
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<tr>
<td>Gudorf, A.</td>
<td>Challenging shock models with SOFIA OH observations in the high-mass star-forming region Cepheus A</td>
<td>2016-01</td>
<td>2016 A&amp;A 585, A45 [DOI]</td>
<td>Interstellar medium</td>
<td>GREAT</td>
<td>01_0113</td>
<td>CYCLE 1</td>
<td>PDF</td>
<td>[ADS]</td>
<td></td>
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<tr>
<td>Wyrowski, F</td>
<td>Infall through the evolution of high-mass star-forming clumps</td>
<td>2016-01</td>
<td>2016 A&amp;A 585, 149 [DOI]</td>
<td>Star formation</td>
<td>GREAT</td>
<td>01_0174</td>
<td>CYCLE 1</td>
<td>PDF</td>
<td>[astro-ph] [ADS]</td>
<td></td>
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<tr>
<td>Ricacher, C.</td>
<td>First supra-THz Heterodyne Array Receivers for Astronomy with the SOFIA Observatory</td>
<td>2015-12</td>
<td>accepted to IEEE Instrumentation</td>
<td>Other</td>
<td>INSTRUMENTATION</td>
<td></td>
<td></td>
<td>PDF [astro-ph] [ADSpre]</td>
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</tbody>
</table>

[astro-ph] [ADS] [Teletalk] [astro-ph]
3. Productivity by Science Instrument

- GREAT and FORCAST dominate time and publications
- EXES and FIFI-LS relatively new but lagging
  - FIFI-LS Principal Investigator engaging team to publish GTO papers during current gap in flights (fall ‘16 to spring ‘17)

<table>
<thead>
<tr>
<th>SI</th>
<th>#Papers</th>
<th>Flights</th>
<th>Hours/Paper</th>
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<tbody>
<tr>
<td>FORCAST</td>
<td>31.5</td>
<td>78</td>
<td>16.8</td>
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<tr>
<td>GREAT</td>
<td>43</td>
<td>66</td>
<td>10.4</td>
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<tr>
<td>HIPO</td>
<td>2</td>
<td>4</td>
<td>13.6</td>
</tr>
<tr>
<td>FLITECAM</td>
<td>1.5</td>
<td>11</td>
<td>50</td>
</tr>
<tr>
<td>FIFI-LS</td>
<td>0</td>
<td>35</td>
<td>∞</td>
</tr>
<tr>
<td>EXES</td>
<td>2</td>
<td>15</td>
<td>51</td>
</tr>
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</table>
Summary: Measuring Productivity

1. Status of GI Projects
   Implemented mitigations to improve GI project completion.
   Beginning to collect status for Cycle 3.

2. Publications
   Slow by steady increase in SOFIA publications.

3. Production by Science Instrument
   Publications arise predominantly from FORCAST and GREAT, which have established communities.
   FIFI-LS had late development of calibration procedure and still lacks data from Water Vapor Monitor.