Observing Time Utilization

Erick Young
SOFIA Science Center
Types of SOFIA Observing Time in Table

• General Investigator Time
  – Selected investigations from the annual Call for Proposals
  – 80:20 split in offered time

• Guaranteed Time
  – Given to the instrument teams as reward for developing instruments for SOFIA
  – Separate US and German processes
    • US allocations defined in Science Utilization Policies
    • German allocations set by mutual agreement at GSSWG

• Director’s Discretionary Time
  – Set at 7% of the science time

• Calibration Time
  – Time charged to the observatory to maintain calibration
  – Includes setup star at beginning of flight

• Other
  – Everything else, including climbs, descents, dead legs, and engineering tests

• Not Included are Commissioning Flights, Ferry Flights, and pure Engineering Flights
# Cycle 3 Time Utilization (Actuals)

<table>
<thead>
<tr>
<th>Campaign</th>
<th>Net Flights</th>
<th>Instrument</th>
<th>Flight Hours</th>
<th>GTO Hours</th>
<th>GI Hours</th>
<th>Cal Hours</th>
<th>DDT Hours</th>
<th>OTHER</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC3A</td>
<td>1</td>
<td>EXES</td>
<td>47.67</td>
<td>21.38</td>
<td>14.62</td>
<td>5.47</td>
<td>0.00</td>
<td>6.21</td>
<td>1 Cancelled</td>
</tr>
<tr>
<td>OC3B</td>
<td>8</td>
<td>FIFI-LS</td>
<td>75.63</td>
<td>12.85</td>
<td>44.25</td>
<td>9.50</td>
<td>0.91</td>
<td>8.12</td>
<td></td>
</tr>
<tr>
<td>OC3C</td>
<td>6</td>
<td>FORCAST</td>
<td>53.45</td>
<td>3.22</td>
<td>29.87</td>
<td>12.70</td>
<td>0.00</td>
<td>7.62</td>
<td></td>
</tr>
<tr>
<td>OC3D</td>
<td>7</td>
<td>FORCAST</td>
<td>66.22</td>
<td>6.08</td>
<td>40.91</td>
<td>12.83</td>
<td>0.00</td>
<td>6.39</td>
<td>3 Cancelled</td>
</tr>
<tr>
<td>OC3E</td>
<td>2</td>
<td>FLIPO</td>
<td>13.91</td>
<td>4.83</td>
<td>4.20</td>
<td>0.00</td>
<td>0.00</td>
<td>4.88</td>
<td></td>
</tr>
<tr>
<td>OC3G</td>
<td>5</td>
<td>GREAT</td>
<td>47.69</td>
<td>22.92</td>
<td>16.26</td>
<td>3.50</td>
<td>0.00</td>
<td>5.02</td>
<td>1 Cancelled</td>
</tr>
<tr>
<td>OC3H</td>
<td>5</td>
<td>EXES</td>
<td>29.31</td>
<td>5.83</td>
<td>14.57</td>
<td>4.70</td>
<td>0.00</td>
<td>4.21</td>
<td></td>
</tr>
<tr>
<td>OC3I</td>
<td>5</td>
<td>FORCAST</td>
<td>46.44</td>
<td>1.54</td>
<td>29.48</td>
<td>9.30</td>
<td>0.00</td>
<td>5.42</td>
<td>1 Cancelled</td>
</tr>
<tr>
<td>OC3J</td>
<td>3</td>
<td>FLITECAM</td>
<td>28.18</td>
<td>3.03</td>
<td>13.28</td>
<td>7.92</td>
<td>0.00</td>
<td>3.96</td>
<td>1 Cancelled</td>
</tr>
<tr>
<td>OC3K</td>
<td>9</td>
<td>FIFI-LS</td>
<td>74.15</td>
<td>20.70</td>
<td>30.58</td>
<td>13.13</td>
<td>0.00</td>
<td>9.73</td>
<td></td>
</tr>
<tr>
<td>OC3L</td>
<td>9</td>
<td>FORCAST</td>
<td>83.47</td>
<td>6.81</td>
<td>50.35</td>
<td>16.82</td>
<td>0.00</td>
<td>9.49</td>
<td>In Progress</td>
</tr>
<tr>
<td>OC3M</td>
<td>10</td>
<td>GREAT</td>
<td>93.75</td>
<td>13.65</td>
<td>47.23</td>
<td>8.65</td>
<td>20.17</td>
<td>12.05</td>
<td>In Progress</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>70</strong></td>
<td></td>
<td><strong>659.86</strong></td>
<td><strong>122.86</strong></td>
<td><strong>335.59</strong></td>
<td><strong>104.52</strong></td>
<td><strong>21.08</strong></td>
<td><strong>83.08</strong></td>
<td></td>
</tr>
</tbody>
</table>

As of 13 Nov 2015
OC3L and OC3M are scheduled times

SOFIA Users’ Group 18 November 2015
Director’s Discretionary Time

• DDT is set at 7% of the science time by the Science Utilization Policies SOF-1087 (Jan. 2008)

• Allocated to Science Center Director for:
  – Targets of Opportunity not specified in annual CfP
  – Special projects the Director feels are good for the Observatory
  – Potentially high impact observations that were too risky to pass the TAC process

• Based on 400 Science hours in Cycle 2 and 625 Science Hours in Cycle 3, the DDT allocation was estimated as 28.0 and 58.8 hours, respectively.
  – 17.86 hours in Cycle 2 used
  – 21.08 hours in Cycle 3 used
## Use of DD Time to Date

<table>
<thead>
<tr>
<th>P.I</th>
<th>Title</th>
<th>Instrument</th>
<th>Obs Date</th>
<th>Time (hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>02_0100</td>
<td>P. Garnavich (Univ. of Notre Dame)</td>
<td>&quot;Mind the Gap: Filling in the Holes in IR Spectra of Type 1a Supernovae&quot;</td>
<td>FLITECAM</td>
<td>Feb 2014</td>
</tr>
<tr>
<td>75_0001</td>
<td>R.T. Hamilton (USRA/SOFIA)</td>
<td>&quot;Observations of a Bright Type Ia Supernova in M82&quot;</td>
<td>FLITECAM</td>
<td>Feb 2014</td>
</tr>
<tr>
<td>75_0002</td>
<td>R.D. Gehrz (Univ. of Minnesota)</td>
<td>&quot;Probing The Ejecta And Surroundings of SN 2014J In M82&quot;</td>
<td>FORCAST</td>
<td>Mar 2014</td>
</tr>
<tr>
<td>75_0003</td>
<td>W. Vacca (USRA/SOFIA)</td>
<td>&quot;FORCAST Observations of a Bright Type Ia Supernova in M82&quot;</td>
<td>FORCAST</td>
<td>Mar 2014</td>
</tr>
<tr>
<td>-</td>
<td>J. Spyromilio (ESO)</td>
<td>&quot;DDT proposal to observe Supernova 2014J (J09554214+6940260) in M82 with SOFIA&quot;</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>75_0014</td>
<td>Jochen Eisloffel</td>
<td>Catching the Outbursting New FU Orionis object 2MASSJ06593158-0405277 on the Rise</td>
<td>FORCAST FIFI-LS</td>
<td>Feb 2015 Sep 2015</td>
</tr>
<tr>
<td></td>
<td>Erick Young</td>
<td>Director's Project upGREAT Demonstration [C II] map of Horsehead Nebula</td>
<td>upGREAT</td>
<td>Dec 2015</td>
</tr>
<tr>
<td></td>
<td>Erick Young</td>
<td>Compensation Time for GREAT support of US General Investigators -- 1 hour of DDT per 6 hours of US GI time</td>
<td>GREAT</td>
<td>Cycle 2 Cycle 3</td>
</tr>
</tbody>
</table>

SOFIA Users’ Group 18 November 2015
GREAT Compensation Time

• DD Time awarded to GREAT Consortium as compensation for support of US community since GREAT is funded by Max Planck Society
  – Instrument support
  – Flight support
  – Data processing to Level 3

• Algorithm used is 1 hour of compensation time for every 6 hours of US GI time
SOFIA Observes Supernova 2014J

Vacca et al. 2015

SOFIA Users’ Group 18 November 2015
Fig. 5.— Comparison between the observed spectrum of SN 2014J obtained with FLITECAM on 2014 Feb. 25 (2.83 ± 0.4 µm) and Feb. 27 (JHK bands) UT (in gray) and the CMFGEN model DDC10_A4D1 of Dessart et al. (2014) for three different times after explosion. The model spectra have been scaled to match the flux levels of the data. Dashed lines are model spectra that include reddening due to both Milky Way and M82 dust.
Accretion during the formative stages of low-mass star evolution is an important component of the total luminosity.

This accretion is known to be episodic with long periods of quiet between events.

Archetype of the most dramatic type of outburst in FU Ori which increased in brightness by 6 magnitudes in 1936 and has remained bright since then.

2MASS J06593158–0405277 is a recently discovered member of this class and gives an opportunity to make IR measurements of this rare event.

DDT proposal was submitted by Jochen Eisloffel (Thuringer Landessternwarte Tautenburg, Germany) and accepted.

FORCAST and FIFI-LS used to make photometric measurements of this object. Corresponding far-IR observations with FIFI-LS were also taken in March.
SOFIA Demonstration Observation

• Motivation for this observation was multifold:
  – Highlight a new capability that would be of wide interest to the SOFIA community
  – Provide a scientifically relevant data set for analysis
  – Demonstrate SOFIA’s capability to deploy state-of-the-art instrumentation
  – Provide useful materials for science and public outreach

• Planned observations
  – [C II] 158 mm map of the Horsehead Nebula with the upGREAT 14-pixel array
  – Observations are scheduled for 10 December 2015
Horsehead Optical
Horsehead CO 3-2 Supercam
Horsehead upGREAT Map Region

Background Image
IRAC 8 mm
Plans for Demonstration Observations

- Roughly ½ of a flight has been scheduled for this demonstration observation
- Data will be reduced to Level 3 as quickly as possible
  - Program will be advertised via our newsletter, website, and AAS
  - Anticipated release will be February 2016
- We will produce a paper documenting the observations but not include any scientific interpretation
- Data will have no proprietary restrictions
- Question for SUG: What are the optimal data products that would maximize community participation?