Astrophysics Research Programs

NASA Advisory Council
Astrophysics Subcommittee

17 April 2013

Linda Sparke
Research Program Manager
Astrophysics Division
### Research Program Budget and Spending

#### Most recent competitions

<table>
<thead>
<tr>
<th>Proposals</th>
<th>Year-1</th>
<th>Success</th>
<th>Last Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>APRA-11</strong></td>
<td>162</td>
<td>11.7</td>
<td>27%</td>
</tr>
<tr>
<td><strong>SAT-11</strong></td>
<td>10</td>
<td>8</td>
<td>21%</td>
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<td><strong>ADAP-12</strong></td>
<td>291</td>
<td>8.7</td>
<td>31%</td>
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<td><strong>OSS-12</strong></td>
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<td>1.8</td>
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<tr>
<td><strong>ATP-12</strong></td>
<td>181</td>
<td>3.9</td>
<td>15%</td>
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<tr>
<td><strong>RTF-12</strong></td>
<td>12</td>
<td>0.4</td>
<td>17%</td>
</tr>
</tbody>
</table>

$82.56M spent in FY12 on PI award programs + management overhead

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### Funding for Research Award Programs: $M

- **Data Analysis Program**
- **Lab Astro**
- **IR/sub-mm**
- **Exoplanet**
- **UV/Visible**
- **X-ray, gamma-ray**
- **Theory**
- **Particle Astro**
- **Fund Physics**

[Graph showing funding trend from FY04 to FY14]
### Funding History for Research Awards

<table>
<thead>
<tr>
<th>Amounts in $k</th>
<th>FY04 Final</th>
<th>FY05 Final</th>
<th>FY06 Final</th>
<th>FY07 Final</th>
<th>FY08 Final</th>
<th>FY09 Final</th>
<th>FY10 Final</th>
<th>FY11 Final</th>
<th>FY12 Final</th>
<th>FY13 Request</th>
<th>FY14 Request</th>
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<tbody>
<tr>
<td>Particle Astro</td>
<td>$8,544</td>
<td>$7,671</td>
<td>$8,544</td>
<td>$7,631</td>
<td>$6,672</td>
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<tr>
<td>High Energy UV/Opt/IR/</td>
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<td>$13,693</td>
<td>$14,779</td>
<td>$12,782</td>
<td>$12,406</td>
<td>$13,886</td>
<td>$14,110</td>
<td>$13,911</td>
<td>$14,943</td>
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<tr>
<td>Sub-mm</td>
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<td>$18,742</td>
<td>$21,851</td>
<td>$17,442</td>
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<td>$22,353</td>
<td>$21,534</td>
<td>$21,295</td>
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<tr>
<td>Other</td>
<td>$338</td>
<td>$854</td>
<td>$338</td>
<td>$394</td>
<td>$594</td>
<td>$670</td>
<td>$673</td>
<td>$641</td>
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<tr>
<td><strong>APRA Total</strong></td>
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<td><strong>$40,960</strong></td>
<td><strong>$45,511</strong></td>
<td><strong>$38,250</strong></td>
<td><strong>$38,765</strong></td>
<td><strong>$45,110</strong></td>
<td><strong>$44,577</strong></td>
<td><strong>$44,090</strong></td>
<td><strong>$50,573</strong></td>
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<tr>
<td>Orig Solar Systems</td>
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<td>$3,872</td>
<td>$4,150</td>
<td>$3,673</td>
<td>$2,965</td>
<td>$3,000</td>
<td>$2,807</td>
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<td>Astro Theory Tech Fellows</td>
<td>$10,245</td>
<td>$7,363</td>
<td>$10,245</td>
<td>$10,227</td>
<td>$11,696</td>
<td>$11,890</td>
<td>$12,262</td>
<td>$12,148</td>
<td>$11,816</td>
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<td>R&amp;A (399131)</td>
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<td>$52,195</td>
<td>$59,906</td>
<td>$52,150</td>
<td>$53,426</td>
<td>$60,000</td>
<td>$59,646</td>
<td>$59,611</td>
<td>$66,172</td>
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<td>ADAP/LTSA</td>
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<td>$15,700</td>
<td>$15,189</td>
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<td>$12,013</td>
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<td>$67,895</td>
<td>$75,095</td>
<td>$64,791</td>
<td>$65,439</td>
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<td>$72,904</td>
<td>$73,743</td>
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<tr>
<td>TPF/FS Beyond</td>
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<td>$3,000</td>
<td>$2,000</td>
<td>(Foundation Science: now in ATP)</td>
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<td>ASMCS (399131) Mission concept studies</td>
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<td>$442</td>
<td>$968</td>
<td>$613</td>
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<td>Experimental Fundamental Physics: now in APRA</td>
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<tr>
<td><strong>TOTAL ($M)</strong></td>
<td><strong>$77.10</strong></td>
<td><strong>$72.90</strong></td>
<td><strong>$77.10</strong></td>
<td><strong>$64.79</strong></td>
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<td><strong>$74.83</strong></td>
<td><strong>$73.87</strong></td>
<td><strong>$73.93</strong></td>
<td><strong>$82.54</strong></td>
<td>~$82M</td>
<td><strong>$82.62</strong></td>
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Funding for research awards increased by 9% in FY12, in response to Astro2010 Decadal Survey recommendations; this growth was retained in the FY14 request.
# Astrophysics ROSES Competitions

<table>
<thead>
<tr>
<th>ROSES-2012</th>
<th>Due Date</th>
<th>Notification from due date</th>
<th>Rec'd</th>
<th>Selected</th>
<th>Success</th>
<th>Year-1 Award $M</th>
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<tbody>
<tr>
<td>Strategic Astrophysics Technology</td>
<td>22-Mar-13</td>
<td>26</td>
<td>39</td>
<td>↓</td>
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<tr>
<td>Astrophysics Research and Analysis</td>
<td>22-Mar-13</td>
<td>26</td>
<td>182</td>
<td>↑</td>
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<tr>
<td><strong>Elements with NEW STARTS IN FY14</strong></td>
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<td>221</td>
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<tr>
<td>Theory &amp; Comp Networks (with NSF)</td>
<td>14-Feb-13</td>
<td>62</td>
<td>101</td>
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<tr>
<td>Roman Tech Fellowships: Stage 2</td>
<td>1-Feb-13</td>
<td>75</td>
<td>3</td>
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<tr>
<td>Fermi Guest Investigator -- Cycle 6</td>
<td>18-Jan-13</td>
<td>89</td>
<td>233</td>
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<tr>
<td>Kepler Guest Observer - Cycle 5</td>
<td>18-Jan-13</td>
<td>15-Apr-13</td>
<td>87</td>
<td>63</td>
<td>↑</td>
<td>25</td>
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<tr>
<td>Roman Technology Fellowships</td>
<td>8-Nov-12</td>
<td>5-Mar-13</td>
<td>117</td>
<td>12</td>
<td>↑</td>
<td>2</td>
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<tr>
<td>Swift Guest Investigator -- Cycle 9</td>
<td>26-Sep-12</td>
<td>18-Dec-12</td>
<td>83</td>
<td>158</td>
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<tr>
<td>Euclid Science Team</td>
<td>31-Aug-12</td>
<td>7-Nov-12</td>
<td>68</td>
<td>8</td>
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<td>3</td>
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<tr>
<td>Astrophysics Theory</td>
<td>13-Jul-12</td>
<td>6-Dec-12</td>
<td>146</td>
<td>181</td>
<td>↑</td>
<td>28</td>
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<tr>
<td>Origins of Solar Systems</td>
<td>25-May-12</td>
<td>18-Oct-12</td>
<td>146</td>
<td>46</td>
<td>↑</td>
<td>12</td>
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<tr>
<td>Astrophysics Data Analysis</td>
<td>18-May-12</td>
<td>17-Sep-12</td>
<td>122</td>
<td>291</td>
<td>↑</td>
<td>90</td>
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<table>
<thead>
<tr>
<th>ROSES-2011</th>
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<tbody>
<tr>
<td>Strategic Astrophysics Technology</td>
<td>23-Mar-12</td>
<td>30-Aug-12</td>
<td>160</td>
<td>48</td>
<td>10</td>
<td>21%</td>
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<tr>
<td>Astrophysics Research and Analysis</td>
<td>23-Mar-12</td>
<td>3-Aug-12</td>
<td>133</td>
<td>162</td>
<td>↑</td>
<td>43</td>
</tr>
<tr>
<td><strong>Elements with NEW STARTS IN FY13</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Core (Non-GO) solicitations</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Guest Observer solicitations</td>
<td></td>
<td></td>
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</table>

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These reports now appear monthly at http://science.nasa.gov/about-us/smd-programs/astrophysics-research/
Selection and Funding Trends

Funding (in $M) for the fiscal year: awards funded in year N were selected in year N-1

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATP</td>
<td>$11.9M</td>
<td>$12.3M</td>
<td>$12.6M</td>
<td>$11.8M</td>
<td>~$11M</td>
</tr>
<tr>
<td>APRA</td>
<td>$45.1M</td>
<td>$44.6M</td>
<td>$44.1M</td>
<td>$50.6M</td>
<td>~$47M</td>
</tr>
<tr>
<td>ADAP</td>
<td>$14.4M</td>
<td>$13.3M</td>
<td>$14.1M</td>
<td>$16.4M</td>
<td>~$17M</td>
</tr>
<tr>
<td>Total*</td>
<td>$74.8M</td>
<td>$73.9M</td>
<td>$73.9M</td>
<td>$82.5M</td>
<td>~$82M</td>
</tr>
</tbody>
</table>

* includes other R&A elements in addition to ATP, APRA, ADAP
Theory and Computation Networks: a Decadal Survey Recommendation

In October 2011, Thierry Lanz (NASA ApD) and Tom Statler (NSF AST) asked AAAC to consider what a Theory/Computational Networks program might look like:

AAAC members MacLow and Laughlin agreed to lead the effort. They talked with community members, and submitted a report in May 2012, posted at http://www.nsf.gov/events/event_summ.jsp?cntn_id=122569&org=AST

AAAC recommended 3-year awards of ~$0.5M/year to groups with PIs at 3 or more institutions, to focus on areas of greatest potential for progress: Astro2010 priority questions, and others. Review should evaluate effectiveness of the collaboration.

Proposals for TCAN (Theoretical and Computational Astrophysics Networks) were due 14 Feb 2013, for a total $2M-$3M of Year-1 funding from NASA+NSF

We received proposals for 29 investigations (101 proposals) through NSF Fastlane

Tom Statler is leading the review for NSF; NASA staff are Linda Sparke, Keith MacGregor and Joan Centrella.

Review will be at NSF using NSF’s process (Fastlane, etc), with NASA staff present

NSF and NASA will select proposals for funding: investigations may be funded by one agency or by both, but each proposal will be funded by a single agency.
The selection rate for ATP-12 was 15% – proposal budgets have crept higher, and we aimed to fund proposals fully where that was justified.

Expected funding for research awards is flat: new programs (e.g. TCAN, Roman Technology Fellowships) must squeeze in alongside continuing programs.

For FY13 funding, APRA selections were made in August; ADAP selections in September; ATP selections in December. The budget outlook worsened over this period. Many ATP-12 winners did not need a funding start until FY14; we deferred FY13 funds due to other PIs if they could wait. This lien must be paid in FY14.

We have many more very good theory proposals than we can fund: over the past 4 ATP cycles, only ~35% of those rated VG or better have been selected.

ATP-13 proposals are now due 12 July 2013, selections in December (< 150 days) Delaying the due date to Nov (Dec) 2013, thus decisions in March (April) 2014, with most funding to start in FY15, would allow a higher success rate. Considerations include student/postdoc hiring cycles, other proposal deadlines (e.g. NSF AAG), what else?
Backups
These fellowships aim to
... give early career researchers the opportunity to develop the skills to lead astrophysics flight instruments/projects and become principal investigators (PIs) of future astrophysics missions;
... develop innovative technologies that have the potential to enable major scientific breakthroughs;
... foster new talent by putting early-career instrument builders on a trajectory towards long-term positions.

In November 2012 we received 12 proposals from early-career (<7 years since PhD) PIs in non-tenured positions (postdoc, tenure-track, etc.) for a one-year concept study to generate detailed plans and commitments for a 4-year development effort. We selected 2 concept studies.

In February 2013 we received reports (=plans for development, including institutional commitments to lab space, etc.) from last year’s winners, for peer-review to select which should continue to development.
Research Program Budget and Spending

Most recent competitions

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