Spitzer Space Telescope
Cycle-6 Exploration Science Programs

Introduction

- Cryogen depletion expected in mid-April 2009
- No changes in expected instrument performance since Call for Proposals issued
  – IRAC channels 1 and 2 - sensitivity, stability
- Observing efficiency expected to remain high
  – 6500 hours/year
- No GTO time or joint programs
- Selecting science for a two-year warm mission
  – Senior Review proposal for an additional 2.5 years of warm operations expected in 2010
Proposal
Review
Results

Cycle-6 Selection

- 10 programs selected - 10,345 hours
  - Extragalactic 5377 hrs  Galactic/Planetary 4968 hrs

<table>
<thead>
<tr>
<th>PID</th>
<th>Science Category</th>
<th>PI Institution</th>
<th>Title</th>
<th>Co-Is</th>
<th>Hours</th>
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<tr>
<td>60010</td>
<td>cosmology</td>
<td>Wendy Freedman, Carnegie Observatories</td>
<td>The Hubble Constant</td>
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<td>60022</td>
<td>high-z galaxies</td>
<td>Giovanni Fazio, Smithsonian Astrophysical Obs</td>
<td>SEDS: The Spitzer Extended Deep Survey</td>
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<td>60024</td>
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<td>Mark Lacy, Spitzer Science Center</td>
<td>SERVS: the Spitzer Extragalactic Representative Volume Survey</td>
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<td>1400</td>
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<td>60034</td>
<td>high-z galaxies</td>
<td>Eichi Egami, University of Arizona</td>
<td>The IRAC Lensing Survey: Achieving JWST Depth with Spitzer</td>
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<td>60007</td>
<td>nearby galaxies</td>
<td>Kartik Sheth, Spitzer Science Center</td>
<td>The Spitzer Survey of Stellar Structure in Galaxies (S4G)</td>
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<td>657.2</td>
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<td>60021</td>
<td>exoplanets</td>
<td>Heather Knutson, Harvard University</td>
<td>Dynamic Studies of Exoplanet Atmospheres: From Global Properties to Local Physics</td>
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<td>60028</td>
<td>exoplanets</td>
<td>David Charbonneau, Harvard University</td>
<td>Confirmation and Characterization of Kepler Mission Exoplanets: The Era of Rock and Ice Exoplanets</td>
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<td>galactic structure</td>
<td>Barbara Whitney, SSI Space Science Institute</td>
<td>GLIMPSE360: Completing the Spitzer Galactic Plane Survey</td>
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<td>60014</td>
<td>young stellar obj</td>
<td>John Stauffer, Spitzer Science Center</td>
<td>Young Stellar Object Variability: Mid Infrared Clues to Accretion Disk Physics &amp; Protostar Rotational Evolution</td>
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<td>60012</td>
<td>near-earth objects</td>
<td>David Trilling, Northern Arizona University</td>
<td>The Warm Spitzer NEO Survey: Exploring the history of the inner Solar System and near Earth space</td>
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Cycle-6 Selection (2)

• 2 exoplanet programs recommended for DDT

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<tr>
<th>PID</th>
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<td>60003</td>
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<td>Joseph Harrington</td>
<td>The Spitzer Exoplanetary Atmosphere Survey</td>
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<td>60027</td>
<td>exoplanets</td>
<td>Michael Gillon</td>
<td>Detecting the Transits of Nearby Super-Earths</td>
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- Harrington - ToO program for new planets
  • Requested 1400 hours (500 hrs known planets, 900 hrs ToO)
  • Awarded 200 hours DDT

- Gillon - Detecting a super-Earth transit
  • Requested 500 hours
  • Awarded 100 hours DDT

Science Categories-Selected

Number of Proposals Selected

- **Extragalactic (31% success rate)** 5 of 16 proposals
  3 of 8 = High Redshift Galaxies  1 of 2 = Nearby Galaxies  1 of 1 = Cosmology
  0 of 2 = AGN  0 of 1 = High-z Clusters, Jets, Starburst Galaxies

- **Galactic/Planetary Systems (26% success rate)** 5 of 19 proposals
  2 of 7 = Exoplanets**  0 of 4 = Brown Dwarfs  0 of 2 = Star Formation
  1 of 1 = NEOs, YSOs, Galactic Structure  0 of 1 = KBOs, Evolved Stars, Extragalactic Stars
  ** 2 additional proposals awarded DDT

Hours Selected

- **Extragalactic (26% success rate)** 5377 of 20,511 hrs
  Distribution: 39% High Redshift Galaxies  7% Cosmology  6% Nearby Galaxies

- **Galactic/Planetary Systems (28% success rate)** 4968 of 17,538 hrs
  Distribution: 19% Exoplanets (+300 hrs DDT)  19% Galactic Structure
  5% Young Stellar Objects  6% Near Earth Objects
Proposal Review Process

Cycle-6 Resources

- **Exploration Science**
  - Select 10,000 hours to be executed over two years
  - Enable ‘Explorer’ class programs: new, major initiatives not previously possible
  - Minimum proposal size = 500 hours

- **Additional 1500 hours of small programs**
  - selected next spring (cycle-6)

- **1500 hours in small programs will be solicited in cycle-7 (2010)**

- **Data analysis funds** $6 mil total/year
  - Exploration Science: ~ 2/3 of funding
    - No additional funding for ‘Legacy’ products
  - Small programs: ~ 1/3 of funding
Exploration Science Review

- November 17-19, 2008 @ SSC
  - 2 panels: Extragalactic & Galactic/Planetary
  - 8 reviewers/panel + 5 external + TAC chair
  - Panels met Monday/Tuesday
  - TAC met Wednesday

- Conflicts of interest
  - Extremely difficult to handle this cycle
  - No reviewers PI/CoI on proposals

Proposal Submission Summary
Proposals Received

- **35 proposals received**  --  **38,050 hours requested**
  - 46 letters of intent received

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<th>Proposals</th>
<th>Science Category</th>
<th>Hours</th>
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<td>13</td>
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<td>Nearby Universe</td>
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<td>7</td>
<td>Exoplanets</td>
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<td>2</td>
<td>Solar System</td>
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- **Oversubscription ~ 4**

- **Original Legacy Science Program**
  - 34 letters of intent, 28 proposals received, requested ~16,800 hours

Proposal Demographics

- **PIs from 23 Institutions**
  5 - SSC/IPAC  4 - SAO
  2 - Caltech, Carnegie Obs., Harvard, NASA GSFC, Arizona
  1 - Central Florida, Colorado, Davis, Drexel, Geneva, Hawaii, Illinois, Indiana, JPL, NAU, Penn State, RIT, Siena College, SSI, STScI, SUNY Stony Brook
  - One PI based at a foreign Institution (Switzerland)

- **758 total co-investigators (~22/proposal)**
  - 190 institutions, 18 countries
Science Categories

Number of Proposals

- **Extragalactic (46%)** 16 proposals
  - 8 = High Redshift Galaxies
  - 2 = AGN, Nearby Galaxies
  - 1 = High-z Clusters, Cosmology, Jets, Starburst Galaxies

- **Galactic/Planetary Systems (54%)** 19 proposals
  - 7 = Exoplanets
  - 4 = Brown Dwarfs
  - 2 = Star Formation
  - 1 = KBOs, NEOs, Galactic Structure, Evolved Stars, YSOs, Extragalactic Stars

Hours Requested

- **Extragalactic (54%)** 20,511 hrs
  - 31% High Redshift Galaxies
  - 7% AGN
  - 5% High-z Clusters
  - 4% Nearby Galaxies
  - 3% Starburst Galaxies
  - 2% Cosmology, Jets

- **Galactic/Planetary Systems (46%)** 17,538 hrs
  - 15% Exoplanets
  - 12% Brown Dwarfs
  - 5% Galactic Structure
  - 4% Star Formation
  - 3% KBOs
  - 2% NEOs, Extragalactic Stars, YSOs
  - 1% Evolved Stars