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*

PID	Science Category	PI Institution	Title	Co-Is	Hours
60010	cosmology	Wendy Freedman *Carnegie Observatories*	The Hubble Constant	5	**705**
60022	high-z galaxies	Giovanni Fazio *Smithsonian Astrophysical Obs.*	SEDS: The Spitzer Extended Deep Survey	46	**2108**
60024	high-z galaxies	Mark Lacy *Spitzer Science Center*	SERVS: the Spitzer Extragalactic Representative Volume Survey	46	**1400**
60034	high-z galaxies	Eiichi Egami *University of Arizona*	The IRAC Lensing Survey: Achieving JWST depth with Spitzer	12	**526.4**
60007	nearby galaxies	Kartik Sheth *Spitzer Science Center*	The Spitzer Survey of Stellar Structure in Galaxies (S4G)	29	**637.2**
60021	exoplanets	Heather Knutson *Harvard University*	Dynamic Studies of Exoplanet Atmospheres: From Global Properties to Local Physics	10	**1138**
60028	exoplanets	David Charbonneau *Harvard University*	Confirmation and Characterization of Kepler Mission Exoplanets: The Era of Rock and Ice Exoplanets	9	**800**
60020	galactic structure	Barbara Whitney, SSI *Space Science Institute*	GLIMPSE360: Completing the Spitzer Galactic Plane Survey	51	**1980.3**
60014	young stellar obj.	John Stauffer *Spitzer Science Center*	Young Stellar Object Variability: Mid Infrared Clues to Accretion Disk Physics & Protostar Rotational Evolution	36	**550**
60012	near-earth objects	David Trilling *Northern Arizona University*	The Warm Spitzer NEO Survey: Exploring the history of the inner Solar System and near Earth space	14	**500**

Cycle-6 Selection (2)

- **2 exoplanet programs recommended for DDT**

PID	Science Category	PI Institution	Title	Co-Is	Hours
60003	exoplanets	Joseph Harrington *Univeristy of Central Florida*	The Spitzer Exoplanetary Atmosphere Survey	16	**200 DDT**
60027	exoplanets	Michael Gillon *Geneva University*	Detecting the Transits of Nearby Super-Earths	12	**100 DDT**

  - *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*

Proposals	Science Category	Hours
13	Distant Universe	17,596.1
3	Nearby Universe	2,915.3
7	Exoplanets	5,690.0
10	Galactic	10,018.1
2	Solar System	1,829.8

  - *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