Technology and Innovation Committee Report

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May 5, 2011

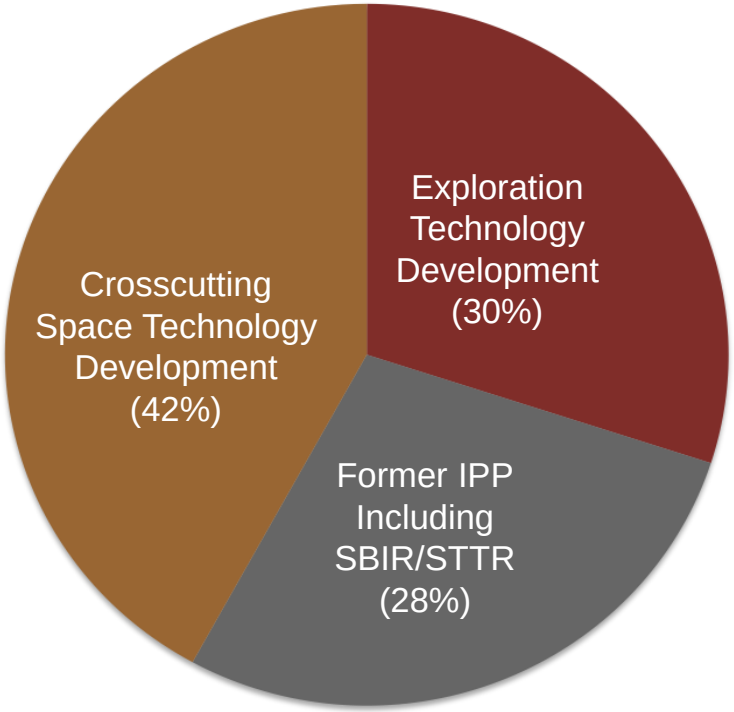
April Meeting of T&I Committee

- NASA HQ in Washington, DC, April 28-29, 2011.

  Meeting Agenda included:
  - Update and overview of OCT and Space Technology
  - Presentation and discussion around Portfolio and Knowledge management
  - Updates on program planning for the SBIR/STTR, NIAC, and Flight Opportunities Space Technology programs
  - Follow-on discussions from January meeting concerning NASA, tech transfer, IP and licensing
  - Update on emerging commercial space efforts
  - The T&I Committee's annual ethics briefing

Proposed FY 2012 Space Technology Budget

- In FY 2012, Space Technology is proposed at approx. 5% of the President's $18.7B request for NASA.
- The $1024M for Space Technology in FY 2012 includes:
  - The SBIR/STTR program and related technology transfer and commercialization activities ($284 million) funded in FY 2010 through NASA's Innovative Partnership Program
  - Movement of a majority of the Exploration Technology Development and Demonstration activities ($310 million) from the Exploration Systems Mission Directorate
  - The Crosscutting technology development activities ($430 million) proposed as part of the President's FY 2011 request.
- All of the Space Technology programs have been carefully formulated over the past year, and have deep roots in technology development approaches NASA has pursued in previous years.
- The FY 2012 request for Space Technology provides a modest increase above the level projected in the NASA Authorization Act of 2010, consistent with the Administration's priority on federal investments in research, technology and innovation across the Nation.
  - The FY2012 request for Space Technology compares with approximately $800 million projected for these same activities in 2012 in the NASA Authorization Act of 2010.



NASA FY2012 Proposed Space Technology Budget ($1024M)

Opportunities

- SBIR/STTR, Flight Opportunities, Center Innovation Fund, Centennial Challenges are ongoing programs**, funded in FY 2011 CR based on enacted FY 2010 levels**.
- Inaugural Space Technology Graduate Fellowship call closed on February 23. Selections anticipated for start of Fall 2011 semester.
- Initial NIAC, Game Changing Development, Technology Demonstration Missions calls released on March 1. Presently open.
    - NIAC seeks transformative ideas to enable new aeronautics and space systems capabilities.
    - Game Changing Development is soliciting proposals for research and technology development for revolutionary improvements in America's space capabilities.
    - TDM proposals are sought in four areas: high-bandwidth deep space communication, navigation and timing; orbital debris mitigation or removal systems; advanced in-space propulsion systems; and autonomous rendezvous, docking, close proximity operations and formation flying.

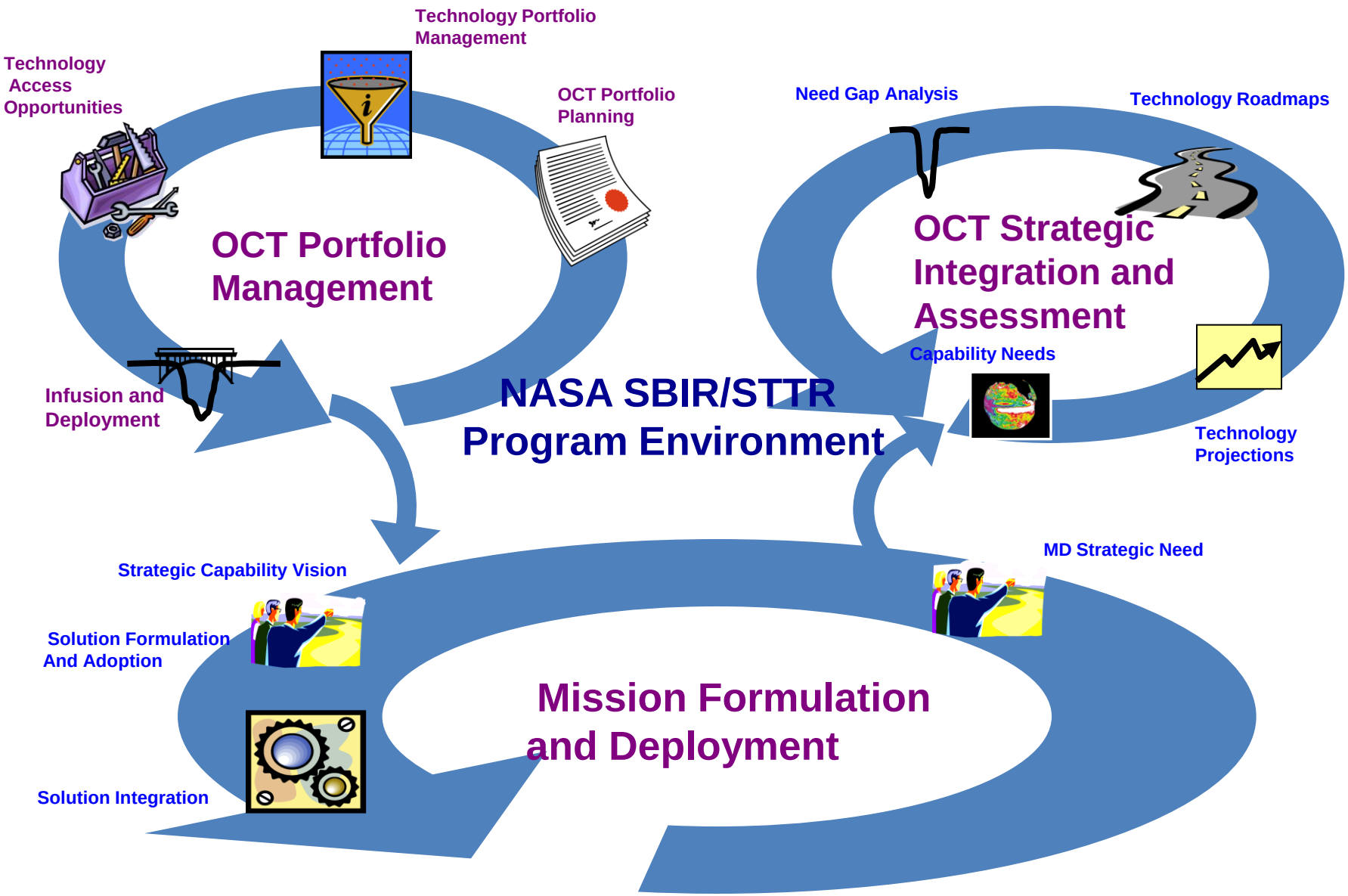
      http://www.nasa.gov/offices/oct/home/solicitations.html
- All proposals must align with Agency's Space Technology Roadmaps and Grand Challenges. Awards are **contingent on availability of fiscal year 2011 appropriations**.
- OCT awards in Space Technology Research Grants, Franklin Small Satellite Subsystem Technology and Edison Small Satellite Demonstration Missions held until FY12.

NASA SBIR/STTR Program Response to OIG 2008 Audit and 2011 Report Recommendations

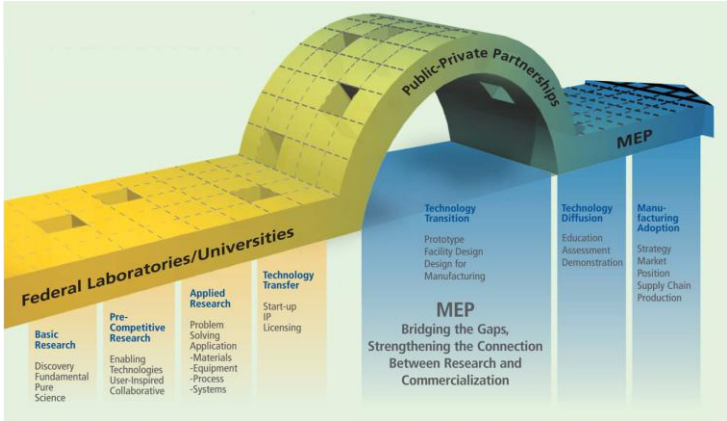
NASA's SBIR/STTR program: Improvements resulting from OIG audit

- **Increase SBIR/STTR Program Awareness**
  - Individual Performance Plan, monetary awards implications; in-reach at Centers.
  - Program EHB and Process Overview as part of IG Training (Completed October 12th)
- **Acquisition Integrity Training for COTR & program staff: Waste, Fraud and Abuse**
  - Implement training; establish SBIR/STTR program liaison with Acquisition Integrity Program. (Established)
- **SBIR/STTR EHB Enhancement**
  - Utilize Cloud Computing software for making comparisons among technical proposals. (EHB capability completed)
- **Increase Admin Management Level II**
  - Strengthen EHB security. (NAMS)
  - Re-establish commercial metrics survey of firms. (System in place ready for July2011 Start up)
  - **Waste, Fraud and Abuse media campaign (First Publication completed)**
- **NSSC Increased Support**
  - **Greater contract surveillance; Virtual Site Visits; (Validation completed with (29) 2009 Phase II ARRA projects)**
  - Past Performance validation. (Database Completed)
  - Quarterly re-certification. (Completed)
  - Greater scrutiny of technical proposals and cost/price analysis. (completed)
- **Increased Center Admin Management** (Completed increase for 2011)
  - SBIR/STTR Increased administration support at Centers to ensure sufficient internal controls oversight and contract performance surveillance (Additional 10 FTE's Requested for 2012 Support funds)

SBIR/STTR Program and its many Interfaces



Partnerships for Economic Growth



- NASA recently signed a Space Act Agreement with the Colorado Association of Manufacturing and Technology (CAMT).
  - Develop a pilot initiative focused on accelerating technology transfer and commercialization through the creation of a regional Technology Acceleration Park (TAP), focused on the Aerospace and Energy sectors.
  - Other partners include: NREL, Department of Commerce, ITA, Department of Labor, University of Colorado, Colorado State Department of Economic Development, Jefferson Country Workforce Development Council, Colorado STEM Network, Governor's Office.
- NASA seeks to replicate this model in other states and regions, to drive regional economic growth and strengthen aerospace and energy supply chains.

Innovation Ambassadors

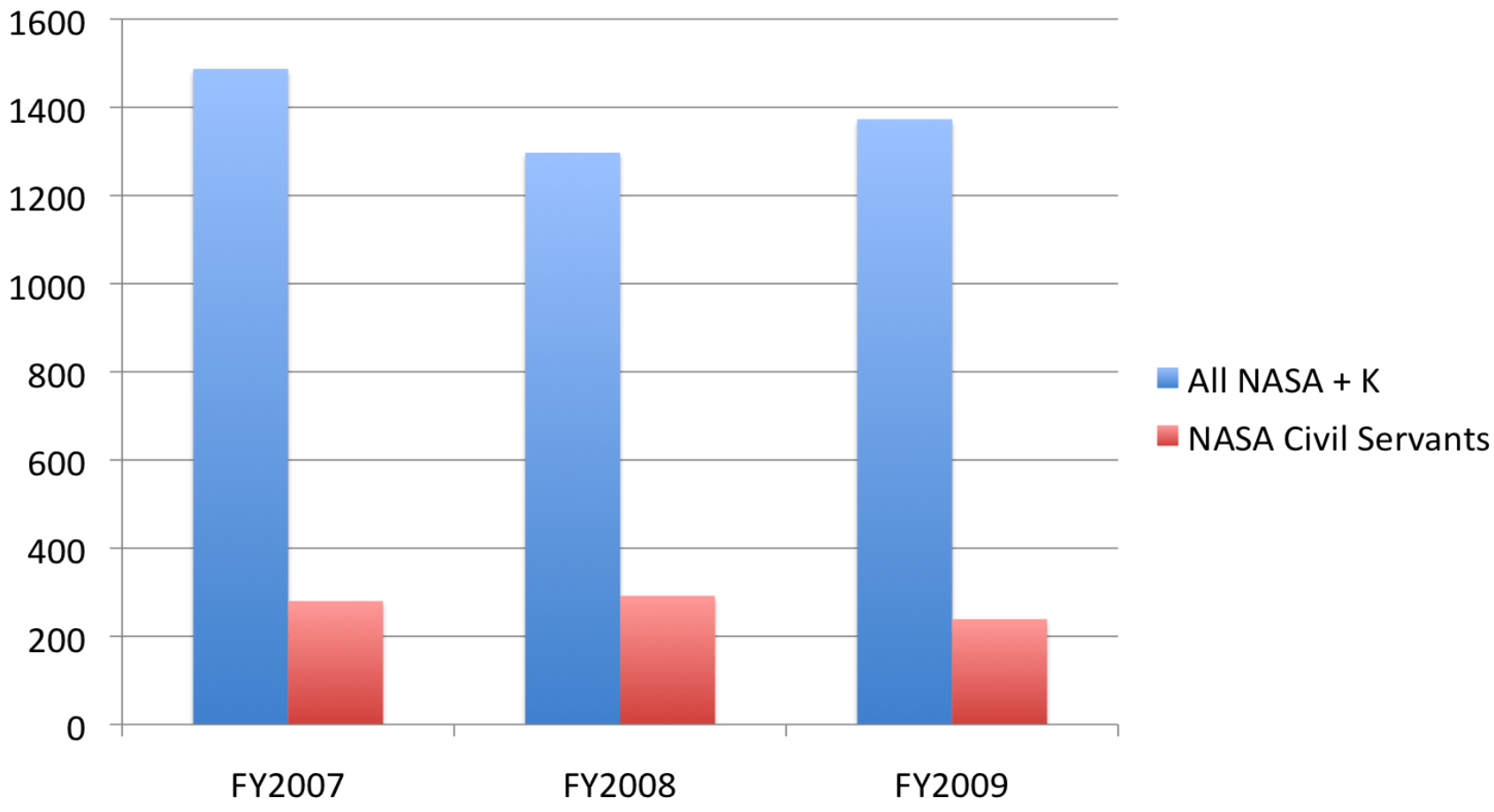
- The Innovation Ambassadors are nominated by their home organizations to participate in this temporary developmental assignment.
  - The program is established in partnership with the Office of Human Capital Management and the Office of the Chief Engineer Academy of Program/Project and Engineering Leadership (APPEL).
- Selected Ambassadors are assigned to work with a host external organization for up to one year.
  - The host organization will have the benefit of the expertise of the NASA employee at no cost.
  - The nominating NASA organization continues to fund the individual and prepares a re-insertion plan for the completion of the assignment.
  - The NASA employee will focus on improving technical and management skills while learning, on a day-to-day basis, about the innovative technologies and processes used by the host organization.
  - OCT funds the extended TDY (if any) for the selected Ambassadors.
- Following the assignment, the NASA employee will be expected to disseminate the new knowledge within NASA and lead efforts to implement new technologies and process improvements based on the experience.

Civil Servant Innovation

- Numbers show that NASA may not be effectively capturing CS innovation.
- GSFC doubled disclosures through training
  - From approx. 50/yr. to 100+/yr.
  - Now >1/3 NASA CS reports
- OCE/OCT/OGC reviewing awards system to improve CS participation.

http://www.nasa.gov/offices/ogc/commercial/

Invention Reports by NASA Civil Servants



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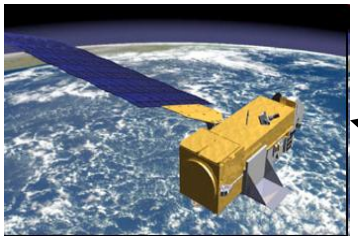
SBIR/STTR Technologies & Mission Utilization



Aura

Phoenix

Hubble

Rosetta

Xionetics
Deformable Mirror Technology

Spaceborne, Inc.
Correlator Chip for Radio Astronomy

Yardney Technical Products
Lithium-Ion Batteries

SpaceDev
Wet Chemistry Analysis

Honeybee Robotics, Inc.
Icy Soil Acquisition Device

Starsys Research
Heat Switch Control Radiator

IA Tech
Planning Collaboration Software

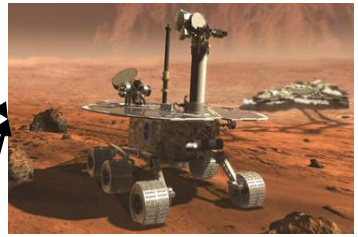
Maxwell Technologies
Electronics

Advanced Optical Systems
Video Guidance Sensor

Surface Optics Corporation
Mirror Coating Process

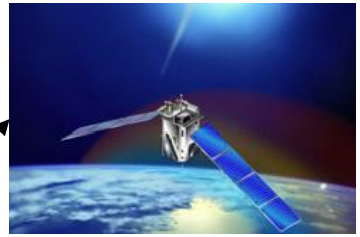
Sensor Sciences, LLC
UV Detectors

Palomar



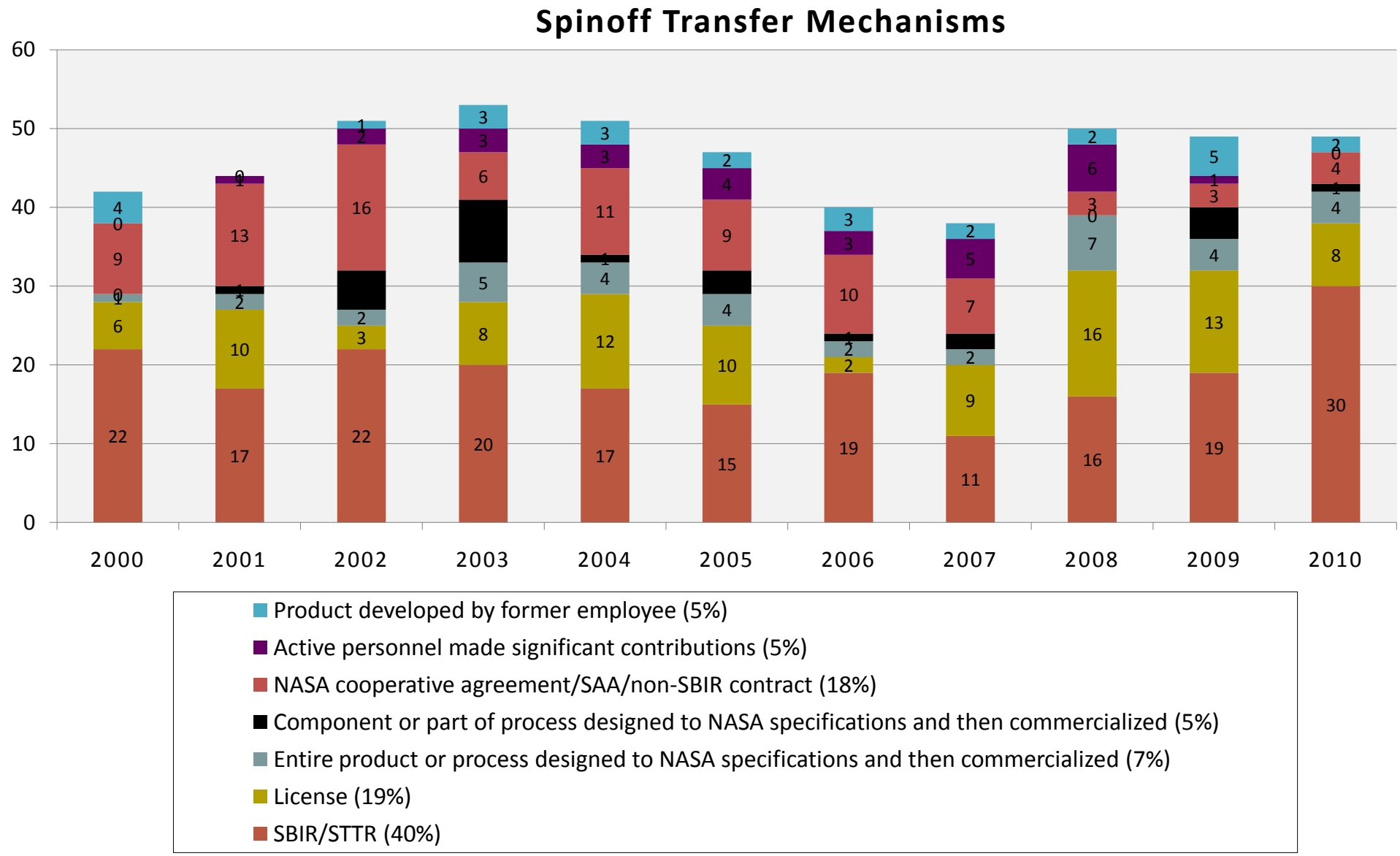
MER

Kepler



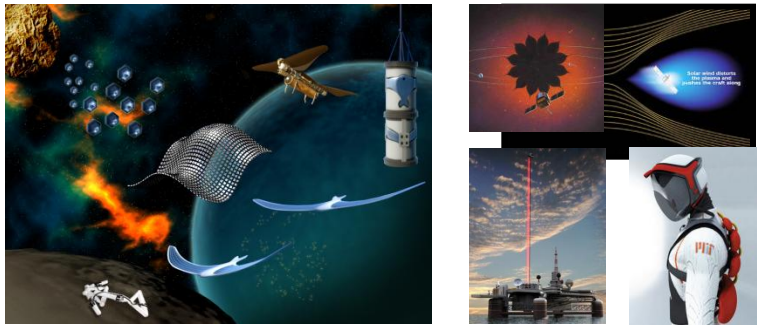
TIMED

Sources of Spinoffs



NASA Innovative Advanced Concepts (NIAC)

Managed at NASA Headquarters



Studies exploring revolutionary yet credible ways to "change the possible" in aerospace

Objective

Early studies of visionary, long-term concepts

- Aerospace architecture, system, or mission concepts (TRL 1-2 or early 3, 10+ years out)
- OCT is re-establishing this effort as the *NASA Innovative Advanced Concepts* program
  - Guided by NRC findings and recommendations*
  - Run internally from HQ, and allowing internal NASA/JPL participation

*NRC report, *Fostering Visions for the Future: A Review of the NASA Institute for Advanced Concepts*, 2009

Acquisition Strategy

- **Phase 1:** To examine the overall viability of an innovative system or concept; open competition
- **Phase 2:** To further develop the concept and assess key issues such as cost, performance, development time, infusion path, and business case; competitively selected from successful Phase I
- Selections will be based on independent peer review of all qualified proposals; competition of ideas

Awards

- **Phase 1**: Up to 1 year, $100K; 15-20 per year
- **Phase 2**: Up to 2 years, $500K; will ramp up to 3-8 per year

Collaboration

- Proposals welcome from all sources, including academia, industry, all US government agencies (including NASA and JPL), and partnerships.

Flight Opportunities Program Funding

- $17M annual budget
- Flight Opportunities Program funds:
  - Flight Opportunities
  - Payload Integration
  - Flight Vehicle Capability Enhancements
  - Payload Development to “Prime the Pump”

Payload Development through Other Sponsors

Announcement of Opportunities for Payloads

- Announcement Released on December 21, 2010
  - Parabolic Flights
  - Developmental/Suborbital Flights
- Technology Payloads Solicited from All Organizations
- Open Call until December 31, 2014 (http://go.usa.gov/rlq)
  - Current Opportunities Closed Feb 23, 2011
  - 23 Proposals Received
    - 17 for Parabolic Aircraft Flights
    - 4 for Suborbital RLV Flights
    - 2 for Both
  - Evaluation criteria
    - Applicability to OCT Technology areas (Roadmaps)
    - Risk reduction
    - Current TRL
    - Benefit to OCT (Demonstration & Transition)
    - Readiness to fly
    - Experience of team
  - Selection to be announced this week

Next Opportunity Window Opens in May 2011

Successful Fit & Function Test / Masten Vehicle

Test Flight Scheduled for May 24, 2011

T& I Observations, Findings and Recommendations

- **Short Title of Recommendation:** Delays in SBIR/STTR Funding

- **Recommendation:** Request that senior Agency leadership address issues surrounding the significant delays in FY 2010 and 2011 in funding SBIR/STTR awardees and work to remedy these problems for FY 2012 and beyond.

- **Major Reasons for the Recommendation:** The 2010 determination of severability and subsequent cascading decisions regarding bona fide need provisions and funding rules have resulted in: (1) significant delays in funding of new-start projects, (2) very small funding increments while operating under Continuing Resolutions, (3) an overall inability for NASA to meet its Congressionally-mandated annual funding obligations to small businesses AND (4) Reductions in the benefits NASA can gain from these projects, and (5) de-motivation of internal staff and potential partners. Since 2010, NASA issued only about 30% of the total funding intended for SBIR/STTR. Over 200 SBIR Phase 2 projects selected in October 2010 have not yet been funded as of late April 2011; normally, SBIR Phase 2 projects selected in October are initiated in December and January.

- **Consequences of No Action on the Recommendation:** Additional delays in awards of SBIR/STTR projects which will inhibit hundreds of small businesses from beginning important research and technology development for the Agency and its missions.

Topics for August T&I Committee Meeting

- Continued efforts at examining IP and how NASA can achieve maximum value.
- Probing into details of specific Space Technology programs and projects slated to begin in FY 2011.