National Aeronautics and Space Administration

TECHNOLOGY TRANSFER PROGRAM

BRINGING NASA TECHNOLOGY DOWN TO EARTH

FY2016 Accomplishments and FY2017 Program Plan

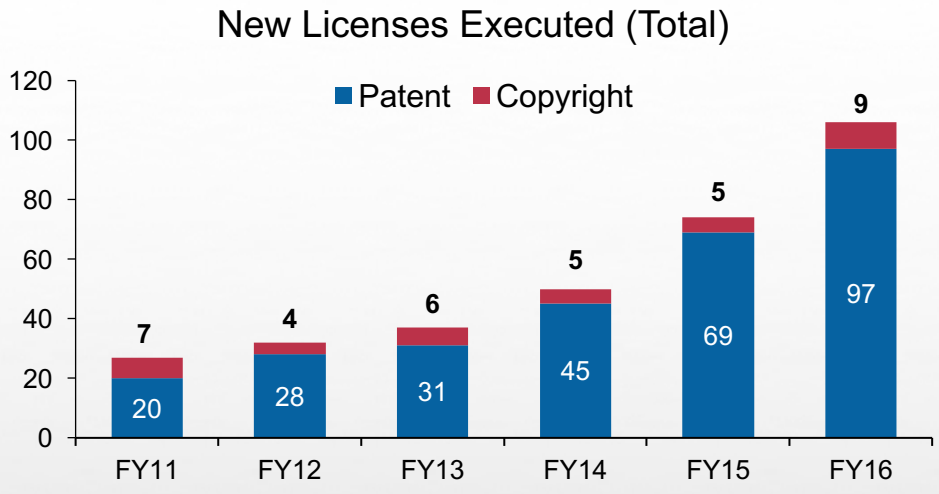
February 27, 2017

www.nasa.gov

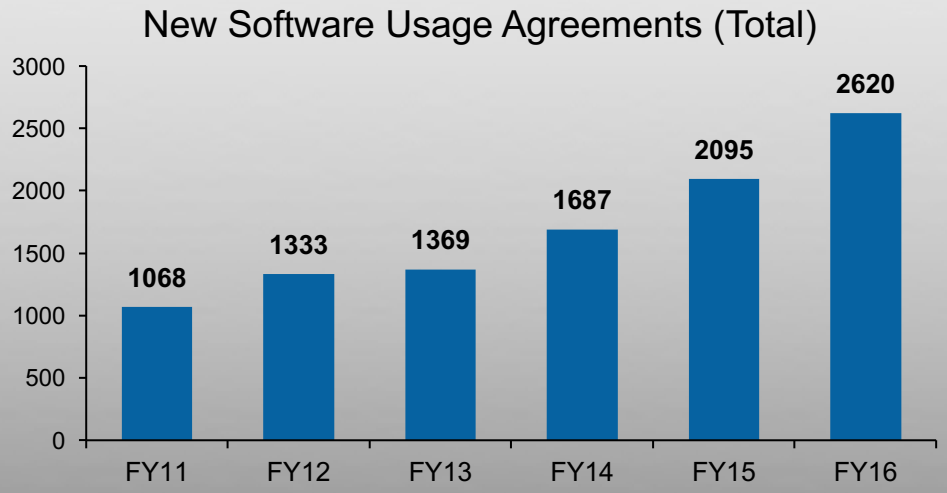
Outline

- **Overview**
  - Trends, Activity Summary, Budget History
- **New Technology Reporting**
  - Trends, New Initiatives
- **Intellectual Property Protection**
  - Trends, Portfolio Composition, Marketing Efforts
- **Licensing**
  - Trends, New Tools and Initiatives
- **Software Release**
  - Trends, Tools, Accomplishments
- **Marketing, Outreach and Publications**
  - Spinoff, Tech Briefs, Web Stats, Exhibits
- **Technology Transfer University (T2U)**
- **NASA Technology Transfer System (NTTS)**
  - Overview, Accomplishments, Plans
- **Annual Program Goals**
- **Benchmarking**
- **Summary**

Sustained Progress



Each of the patent licenses represents a NASA technology being transformed into a commercial product by a domestic company.



Each software release represents time savings, safety improvements, and full utilization of federal resources.

Over the past six years, NASA had made significant improvements in its Tech Transfer capability

- Streamlined and automated processes
- Reduced policy hurdles
- Amplified its interactions with industry
- Deployed new tools

In six years, we've managed a **293% increase** in annual licensing totals and a **145% increase** in software release.

These outcomes represent a significant **return on the taxpayer investment** in NASA technology:

- Jobs created
- Revenue generated
- New products to market
- Quality of life improved

Acceleration of Tech Transfer is tied to the agency's reemphasis on Technology with the creation of the Space Technology Mission Directorate and Office of the Chief Technologist

FY2016 T2 Program Activity Summary

TECHNOLOGY TRANSFER PROGRAM

Identify

- 2428 New Technology Report (NTR) Training Sessions Attendees
- 5524 Active Contracts with New Technology Clause Tracked
- 1876 Contracts with New Technology Clause Closed
- 1554 NTRs Processed and Certified

Protect

- 129 U.S. Patent Applications Filed
- 128 U.S. Provisional Patent Applications
- 103 U.S. Patents Issued
- 11 PCT and Foreign Patent Applications
- 2 Foreign Patents Granted
- 1473 Active Patents

Market

- 484 Tech Briefs Published
- 979 Technology Opportunity Sheets Created
- 787 Software Catalog Titles Published
- 167 QuickLaunch Patents Advertised
- Social Media Followers:
  - Facebook 158,8711
  - Twitter 65,700
  - LinkedIn 5,945

License

- 2620 Software Usage Agreements
- 4 New Joint Ownership Agreements
- 48 New Evaluation Licenses
- 45 New Commercial Licenses
- 6 Copyright Licenses
- 6 Licensing Initiatives New

Monitor

- 233 Active Licenses Maintained
- $3,090,642 Royalties Collected
- 50 NASA Spinoff Stories Published
- 65 Patents Abandoned
- 14 NASA Technology Transfer System (NTTS) System Upgrades

1,233,776 T2 Portal page views in FY2016 3,610,428 Spinoff Website page views in FY2016
923,546 Software Catalog page views in FY2016

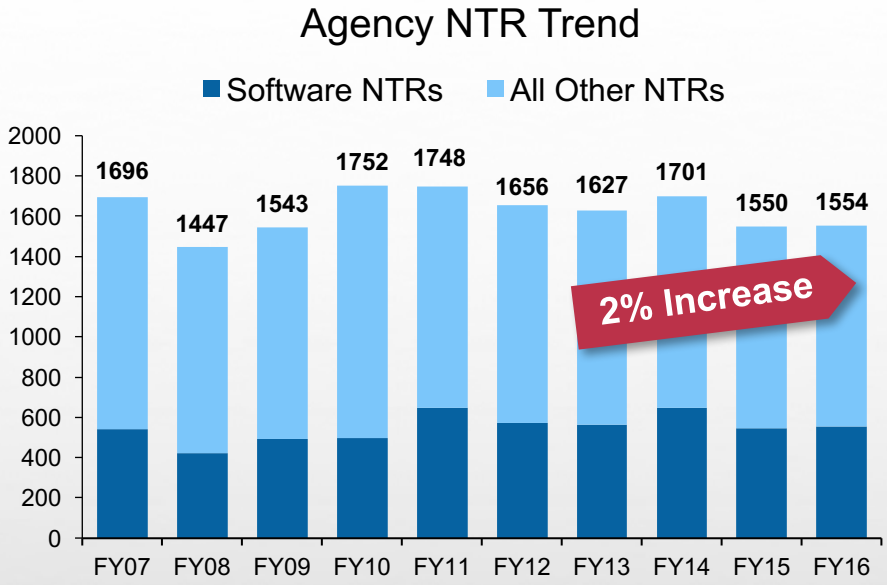
Technology Reporting Requirements

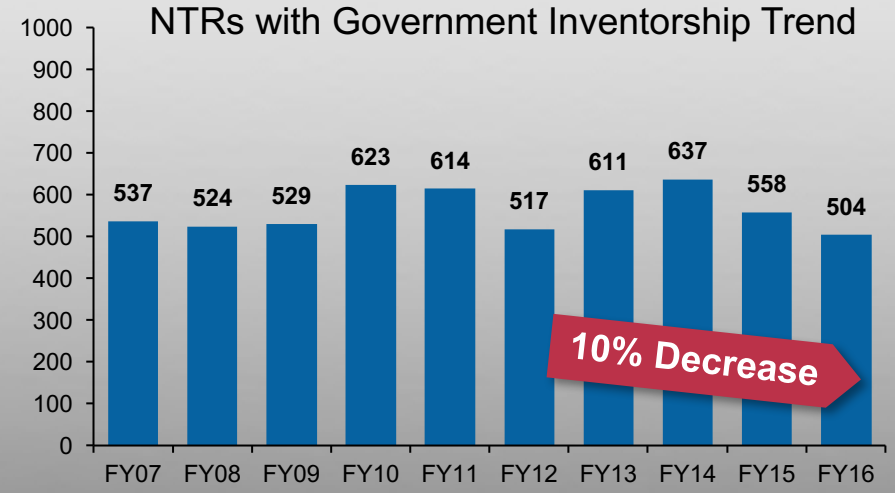
TECHNOLOGY TRANSFER PROGRAM

- Every civil servant, contractor, or grantee is required to disclose any new technology, invention, idea, concept, software – whether or not patentable
- NASA calls these disclosures New Technology Reports, or NTRs
- Each field center has a civil servant New Technology Representative responsible for enforcing this requirement

- Bayh-Dole (35 U.S.C. § 200 et seq.)
- 48 CFR 52.227-11
- 48 CFR 1852.227-70
- 2 CFR 1800.908 or 923
- 2 C.F.R. Part 1800.923
- NASA Policy Directive 2091.1B

New Technology Reporting (NTRs)





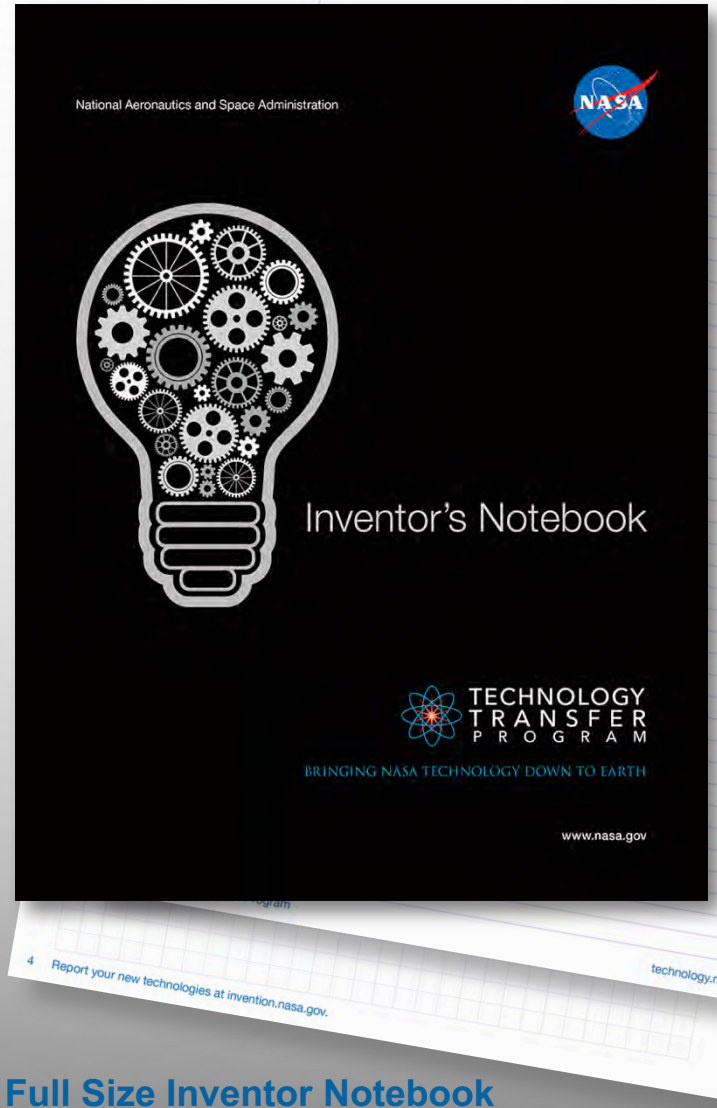
Overall New Technology Reporting is stable

- **2% Increase** in all NTRs
- **10% Decrease** in NTRs with Government Inventorship
- **3% Decrease** in Small Business NTRs
- **1% Increase** in large entity NTRs
- Software makes up 1/3 of all NTRs submitted

Concerned about decrease in NTRs with Government inventorship — ramping up in-reach efforts in response

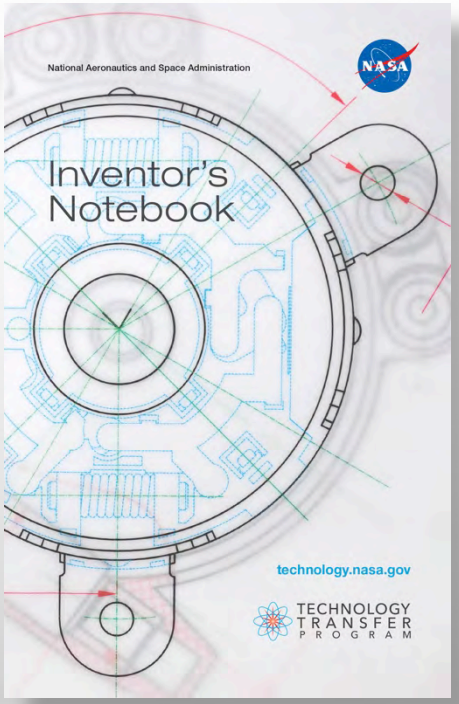
Inventor Notebooks and Challenge Coins

TECHNOLOGY TRANSFER PROGRAM



Full Size Inventor Notebook

NEW! Half Size Inventor Notebook



In FY 2017, the Inventions and Contributions Board (ICB) will distribute new Tech Transfer Challenge Coins to civil servant inventors (and WYE inventors on joint inventions) for submitting NTRs

NTR In-Reach

- In response to declining numbers of disclosures, Field Center Tech Transfer Offices significantly increased local NTR Training

2,428 Training Session Attendees

- Q1: 691, Q2: 594, Q3: 613, Q4: 530

Carolyn McMillan from MSFC presents to Inventors about New Technology Reporting.

Irene Cierchacki from GRC presents to a COR group about New Technology Reporting.

Members from the KSC Tech Transfer Office present during the KSC KickStart Showcase recognizing Inventors for their achievements.

e-NTR Modernization

- Efforts underway to simplify, unclutter, and modernize the e-NTR interface in order to make the invention disclosure process more user friendly
- Team comprised of TTO and OGC representatives
- Customized workflow depending on technology and inventor status (software/hardware, government employee, small business contractor, prime contractor)
- New system will integrate seamlessly with other NTTS tools and data
- Requirements to be delivered to NTTS development team March 2017

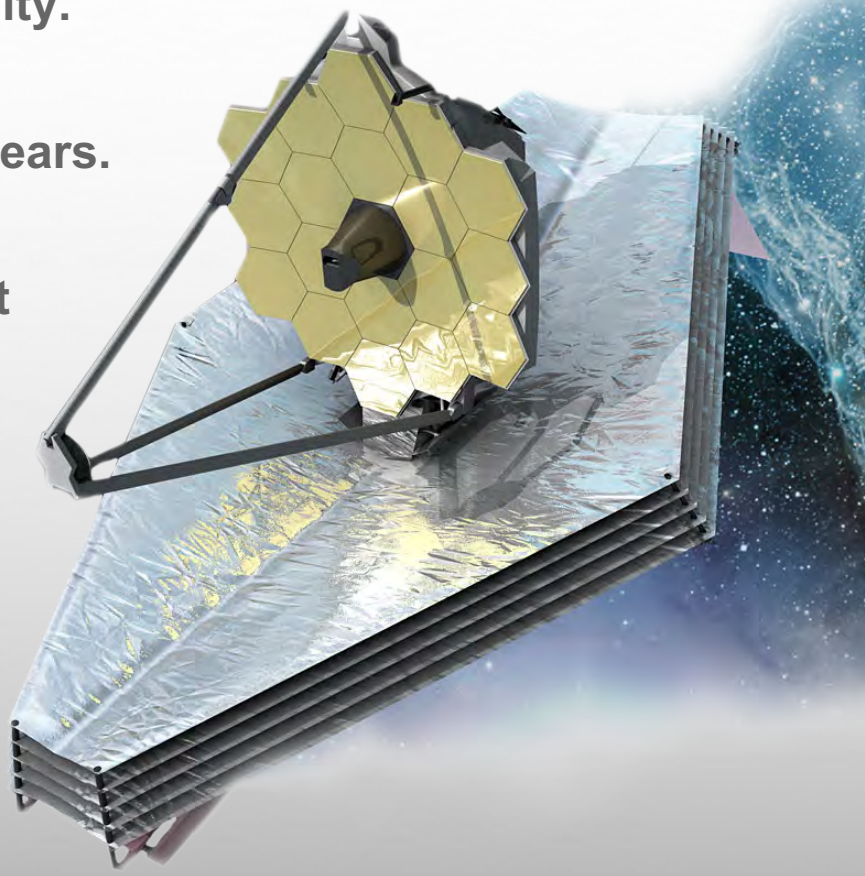
Innovator Dashboard

New dashboard for innovators to track their inventions as they progress through the T2 pipeline. Populated with the entire NTTS innovator data collection and updated real time. Launched March 2016. Version 2 to be released Spring 2017.

NASA Patents

TECHNOLOGY TRANSFER PROGRAM

- We review each NASA-owned invention for technical readiness, market viability, and patentability.
- We only patent a technology that can be brought to market within the next seven years.
- We only patent when we have determined that a patent license is the best way to get a technology to market.
- A decision to patent comes with the Technology Transfer Program's commitment to actively market the technology to industry. In return, we ask that the inventor be ready to work with potential licensees and champion the commercialization efforts.
- Patent licenses generate royalty income, which is largely used to incentivize inventors.



NASA Patents Filed/Issued in FY16

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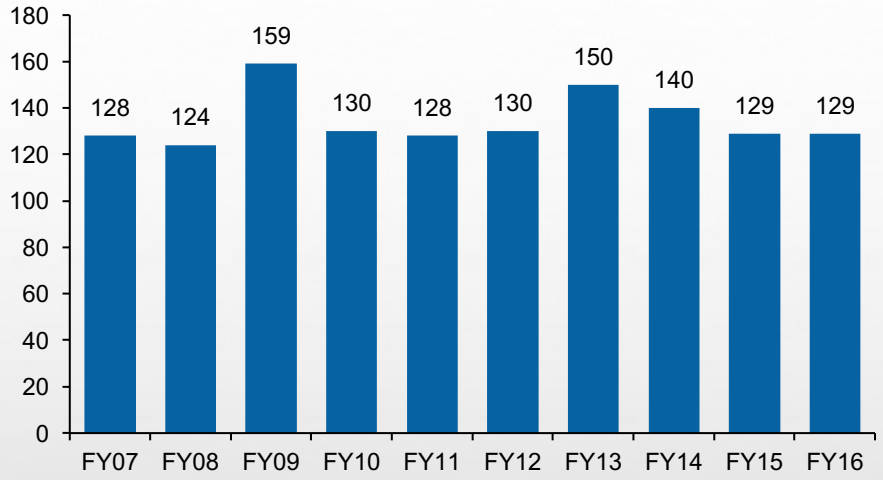
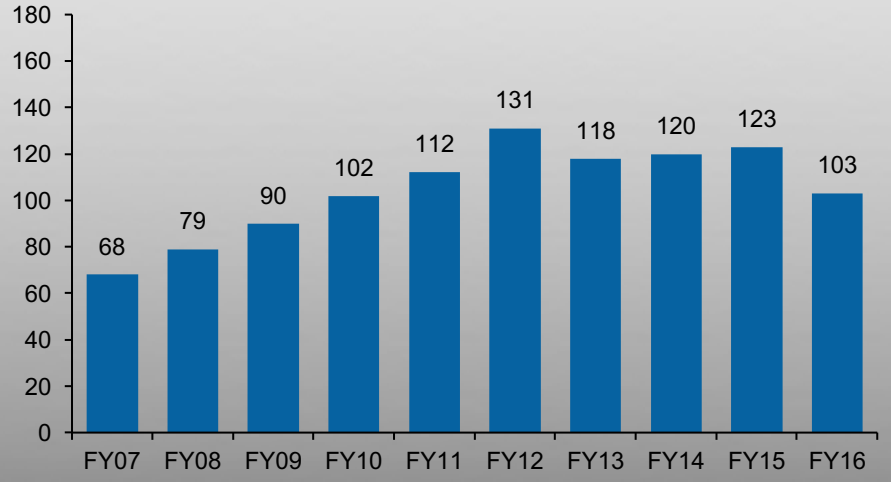
US Patent Applications Filed

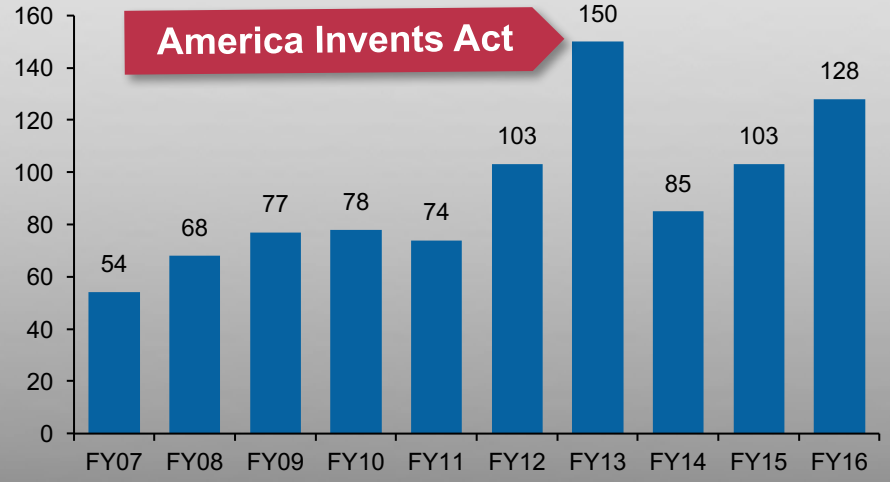


- Technology Transfer Offices and Center Patent Counsel continued shared responsibility for patent decision-making and portfolio maintenance as laid out in 2015 strategy guidance
- NASA's USPTO deposit account budget will permit current levels of patent application filings, patent issuance, and maintenance, for FY17
- USPTO's proposed fee increases announced through NPRM (NASA objected through formal, public comments) will impact above if approved

US Patents Issued



US Provisional Applications



NASA Patent Portfolio Distribution

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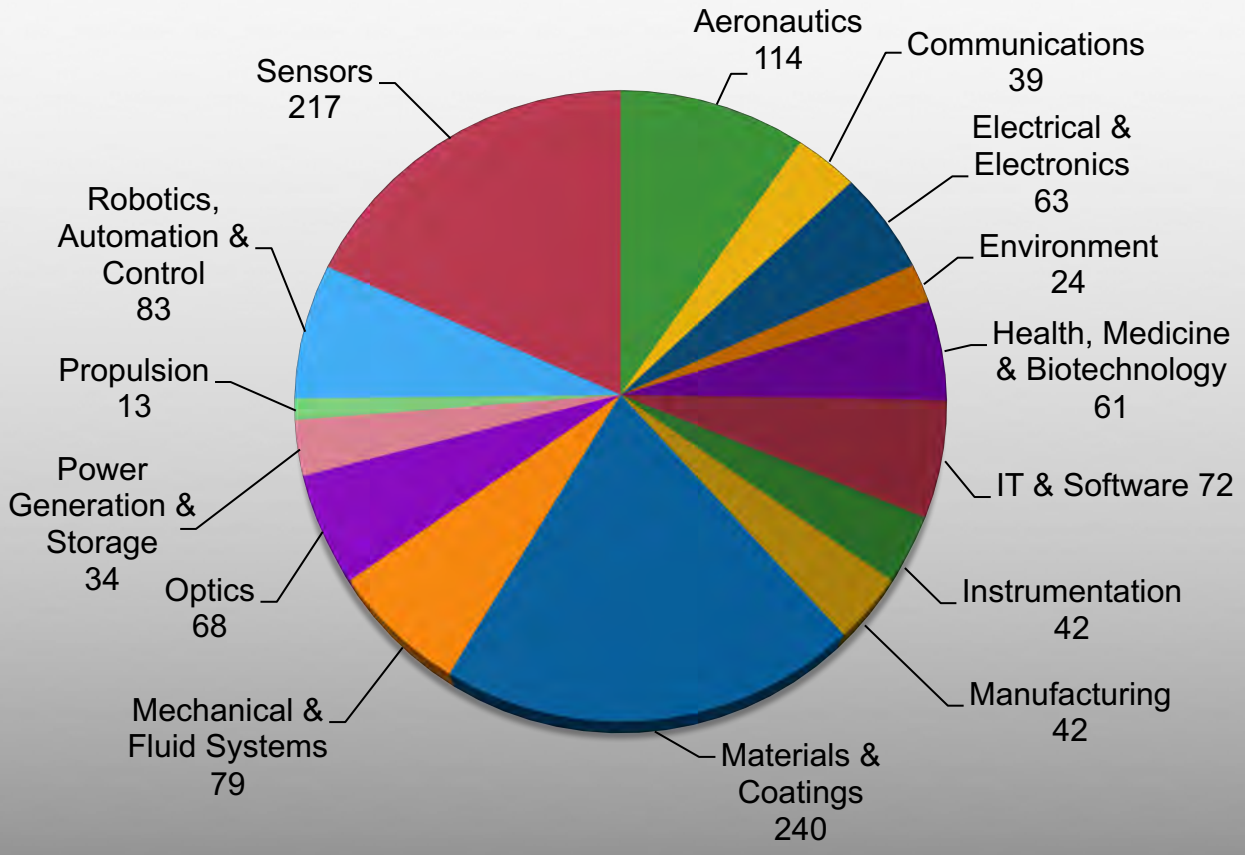
Total patents available for licensing*

- 814 Issued
- 377 Applications
- 305 Patents already licensed/joint ownership — not included here

(Licensees of NASA Patents are typically non-aerospace companies)



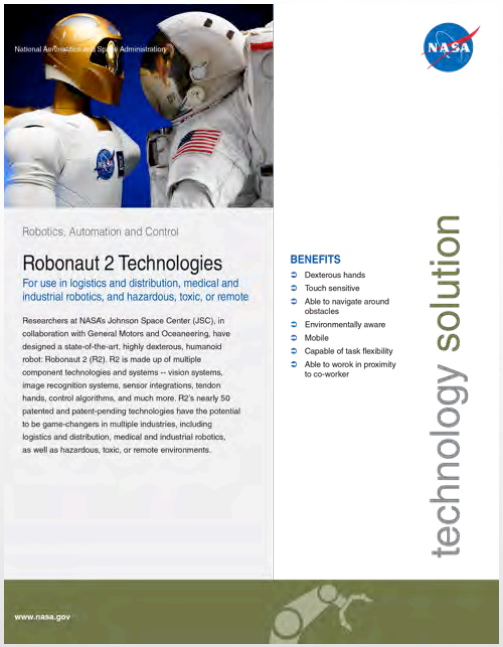
Effort underway with University of New Orleans to validate current categories, auto-sort future technologies by Categories, and build metadata tags to aid searching:

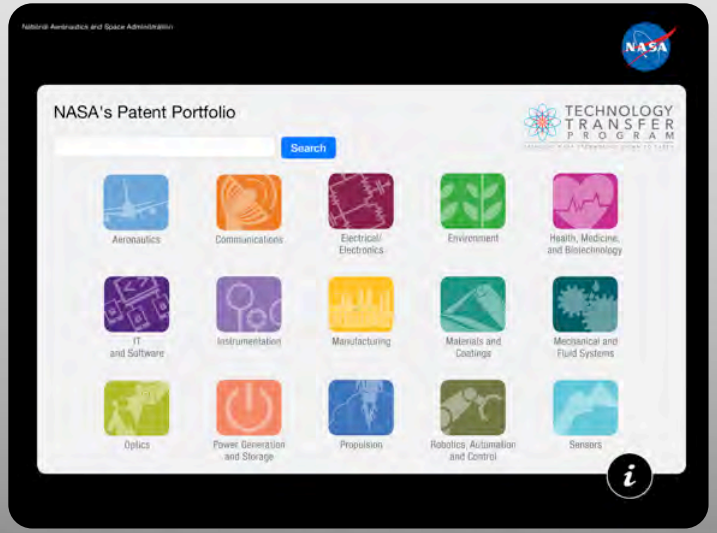
- **System "learns" as new content is added**
- **Data sets augmented with IEEE taxonomy, Wikipedia, etc.**

Next step will to be add NAICS (North American Industry Classification System) codes for industry matching

**Data accurate as of 10-12-16*

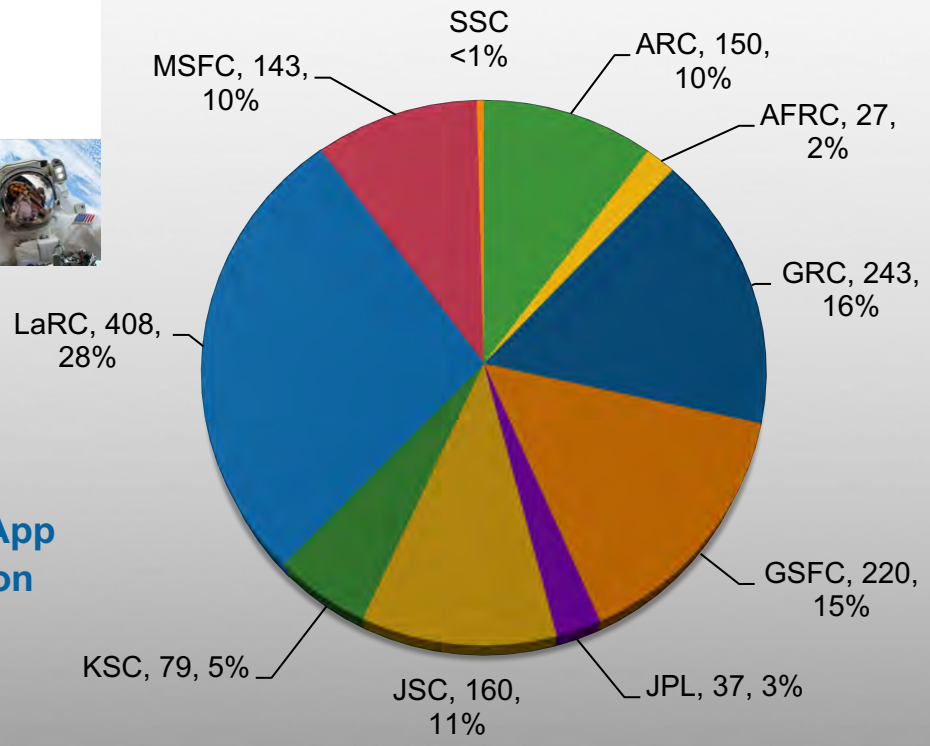
Patent Portfolio Management





Patent Portfolio App available on iTunes

All patented technologies now conform to the Agency patent data sheet template and are searchable through the T2 Portal



Patent Portfolio distribution by Field Center

New Patent Licenses

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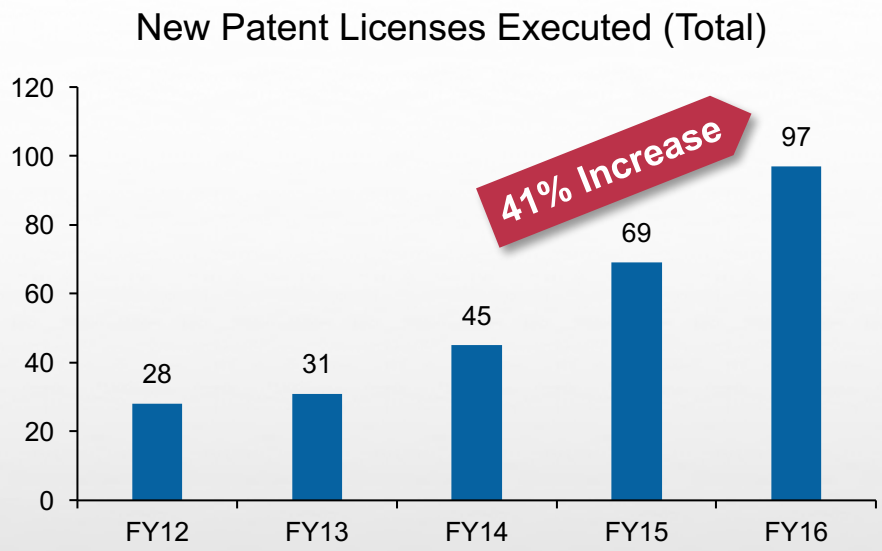
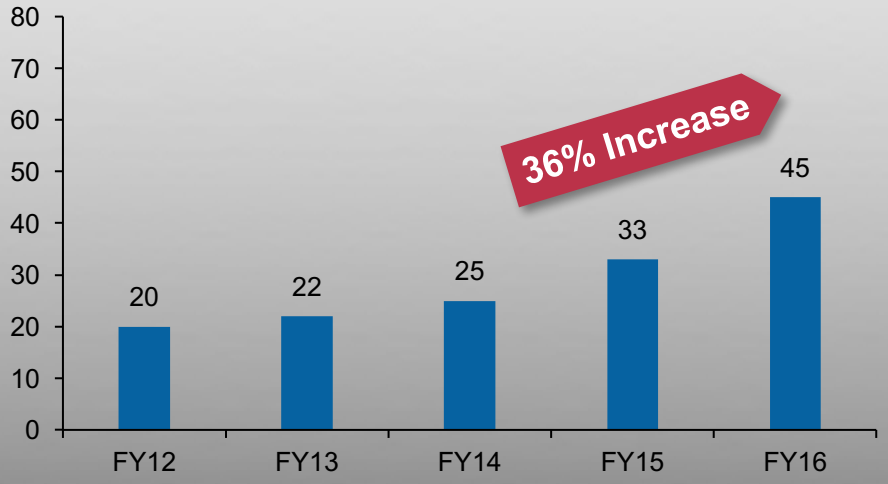
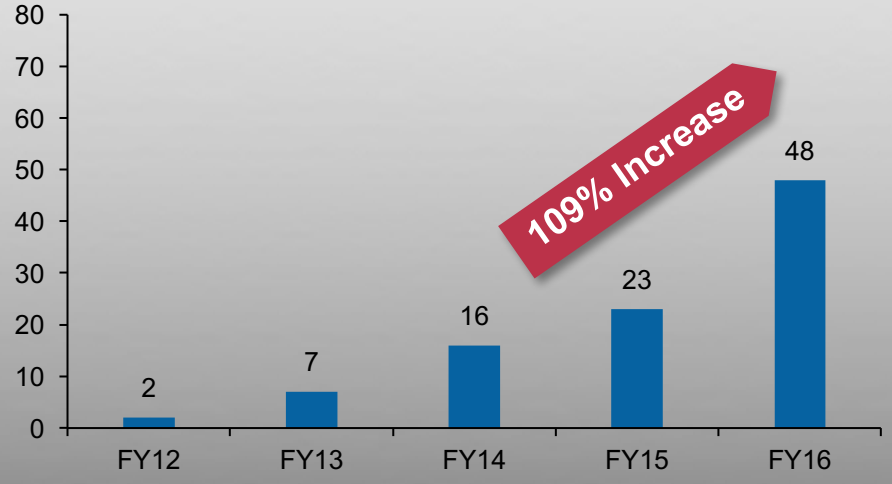


- Overall **41% increase** in Licensing for the agency!
- **36% increase** in commercial licensing
- Emphasis on Evaluation Licenses in FY16 resulted in a **109% increase** over last fiscal year
- **246% increase** since FY12

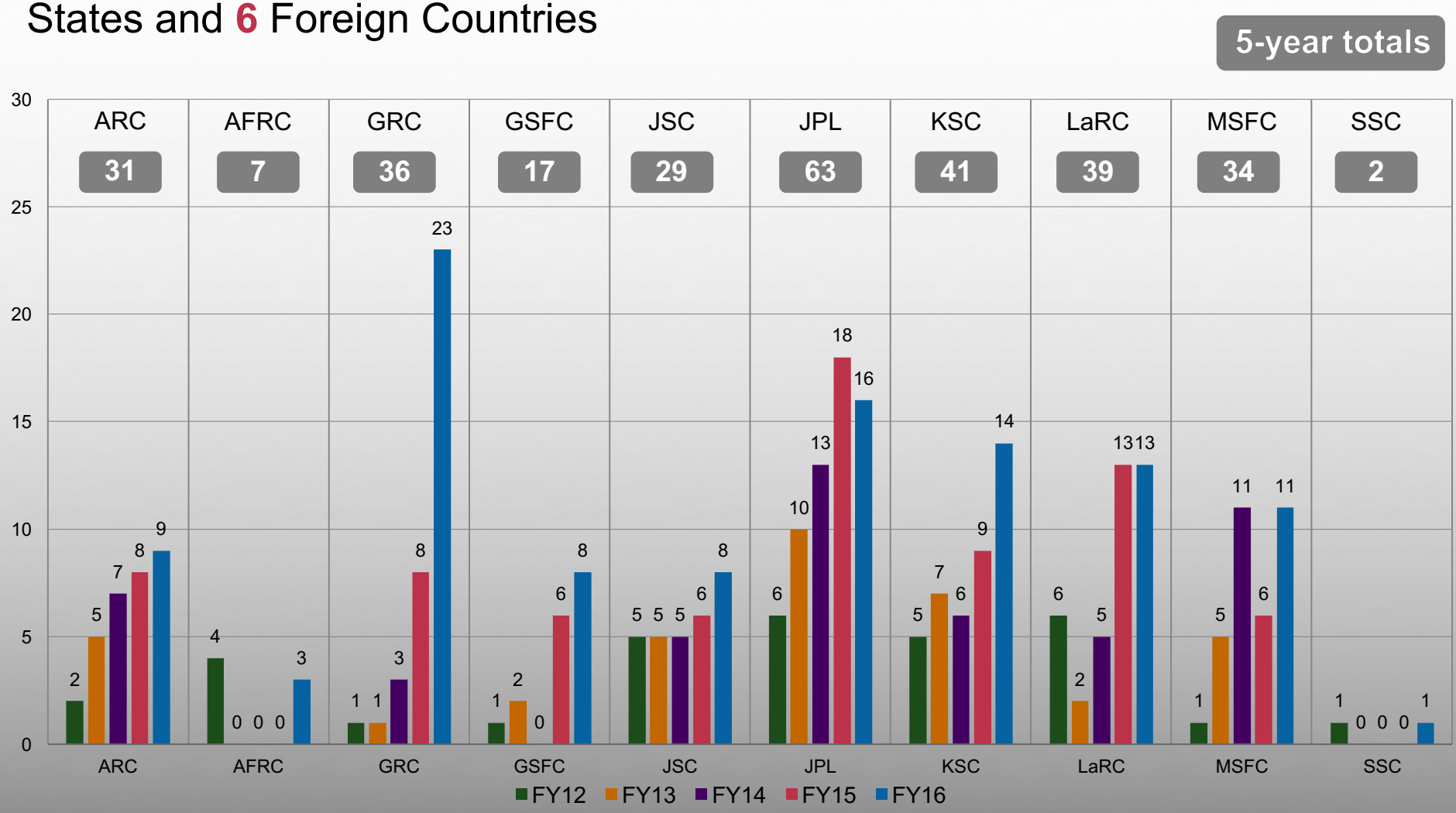




Licensing Trends by Center

Overall positive 5-year trend in licensing

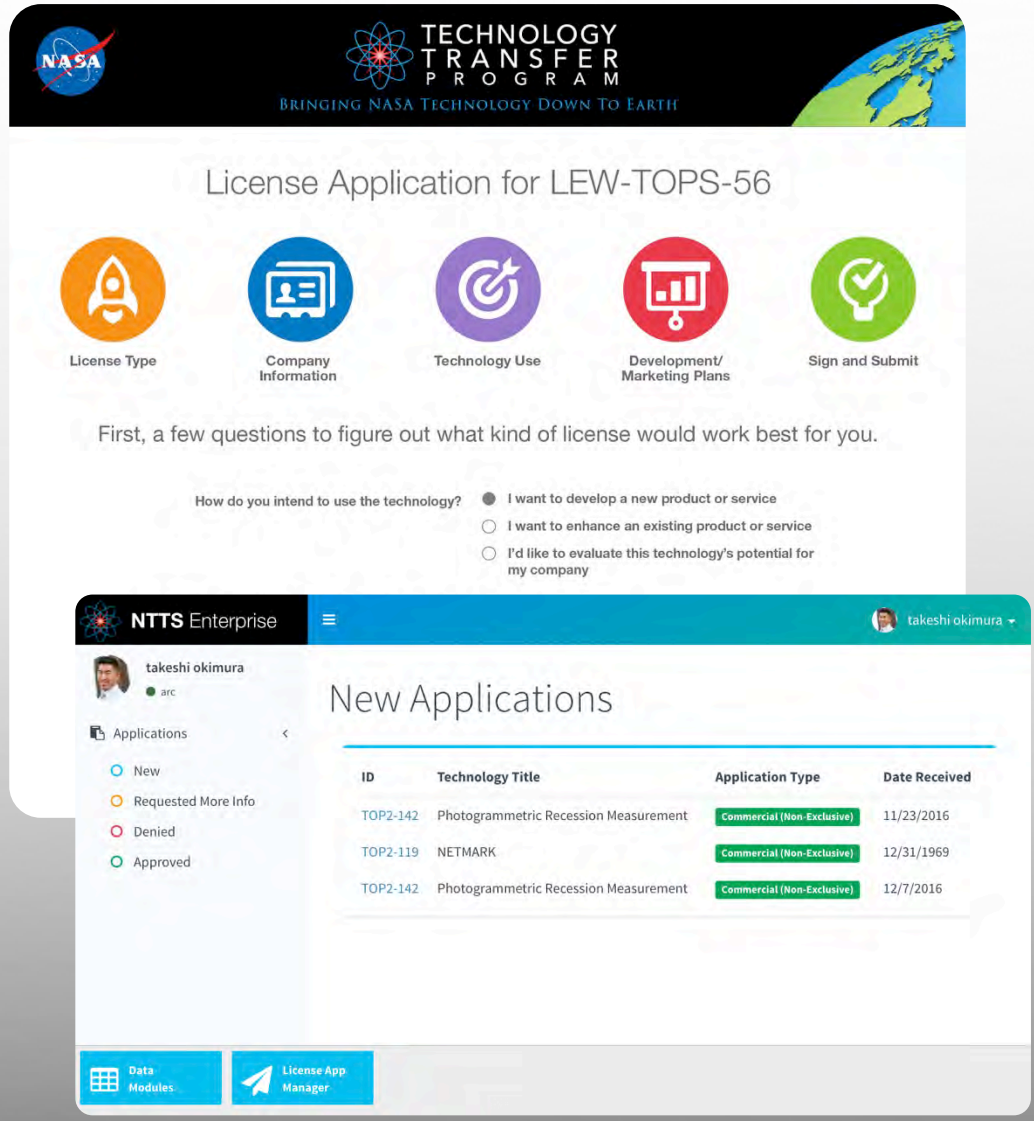
FY16: 106 Licenses granted to **96** Companies in **27** States and **6** Foreign Countries



ATLAS

Automated Technology License Application System

- **One stop shop for companies to apply for licenses on NASA technologies, launched Dec. 2016**
- **Nearly 100 applications started**
- **Simple and interactive user interface to maximize user experience**
- **Addresses the following problems:**
  - Centralized location to apply for licenses
  - Unifies and streamlines Center application processes into a single Agency process
  - Eliminate manual processing of license applications
- **Public launch (press release and social media push) planned for Spring 2017**



Licensing Initiative Highlights

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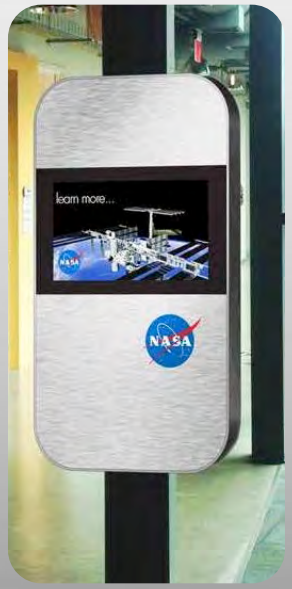
- LaRC Fast Track to Market
- Space Race
- GRC Kiosk



On Tuesday, May 10th, seven NASA Langley inventors pitched their technologies to a panel of industry experts at as part of Langley's pilot "Fast Track to Market Competition," which is being conducted by the Technology Transfer Office. Contestants were vying for assistance with funding, as well as support with business development, market outreach and deal making.



GRC has initiated a Space Act Agreement with Lorain County Community College to install an interactive Kiosk.

It is intended to serve as a resource for students, faculty, and entrepreneurs, by leveraging on the ease of access to the NASA GRC TTO public website.

The Center for Advancing Innovation is operating a pilot business plan competition for NASA.

- 11 NASA patented technologies
- 15 Winners (eligible for significant VC seed funding)
- Receiving license applications

Students listen to Dan Lockney and Rosemarie Truman explain the Space Race.

Space Race Winners

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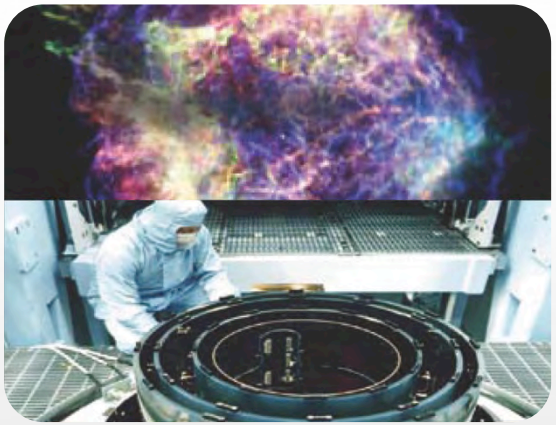
- The CAI has announced 15 winners and finalists for the Space Race
- Technologies from KSC, GRC, LaRC, MSFC, and GSFC were selected by the winners
- The CAI will guide the winning teams towards NASA licensing
- The 15 winners will now compete for a chance at up to $1.2 Million from the CAI



http://www.prweb.com/releases/2016/10/prweb13796631.htm

Startup NASA

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The Startup NASA initiative offers startup companies a license with no up-front costs for commercial use of our patented technologies, we're letting companies hold onto their cash while securing the intellectual property needed to carve out competitive market space.

- Announced the initiative October 7, 2015
- 30 applications have been received
- 17 new companies have formed across the country

technology.nasa.gov/startup

Licensee Survey

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Conducted customer satisfaction survey* of over 100 active licensees

Lessons learned:

- **Our inventors remain the most effective marketing tool that we have.**
- **Times to license ranged from one month to over a year, though respondents did not cite time delays as a significant factor.**
- **About half of the respondents had commercialized the technology, citing product development and maturity of the technology as the two largest obstacles.**
- **A significant majority ranked the overall interaction with NASA as "excellent" and say they would likely license from us again/recommend us to others.**

KSC's SPEARS prototype prior to deployment by licensee, Golder and Associates

Dronicar, Inc. licensed Langley technology for High Altitude Airships

**Survey approved through OMB paperwork reduction act process*

NASA Technology Transfer University

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T2U teaches business students about NASA's technology portfolio, allowing them to work with agency technology and inventors to discover new uses for the innovations in commercial applications.

- The students benefit from the interaction with real inventors, real technologies, and all-around real-world experience
- Student teams may form start-up companies, licensing NASA-patented technologies
- NASA teaches thousands of potential entrepreneurs about the availability of taxpayer-funded technologies across the federal government

T2U
NASA TECH TRANSFER UNIVERSITY

LaRC's TTO hosts a kickoff meeting with the College of William and Mary, the latest addition to the T2U Program.

T2U Student Engagement

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Program Executive Dan Lockney presents to University of Alabama students in the STEM Path to the MBA Program, MSFC's T2U initiative.

SSC inventor Bruce Farner talking with a Loyola professor and his class of MBA students that participated in the T2U program about the floating piston valve.

Terry Taylor, MSFC's Tech Transfer Officer, presents to University of North Alabama students about the benefits of T2U.

Laura Fobel, AFRC's Tech Transfer Officer along with Janeya Griffin present to a T2U class at the University of Southern California.

NASA Software Release

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- NASA generates a lot of software—about 1/3 of the Agency's new technologies are new programs.
- It is our intention to maximize the use of these tools by sharing them with industry, academia,other government agencies, and between NASA projects.
- Before NASA releases software, the developer must demonstrate that the code meets NASA engineering standards, export control and ITAR/EAR restrictions, and that NASA has appropriate ownership rights.
- Software is then categorized by level of availability—open source release at the broadest release and government use only at the most restricted level.
- We publish the codes on software.nasa.gov, the Federal Government's only software inventory portal, and make efforts to market this catalog both internally and with other potential users.

Software Release

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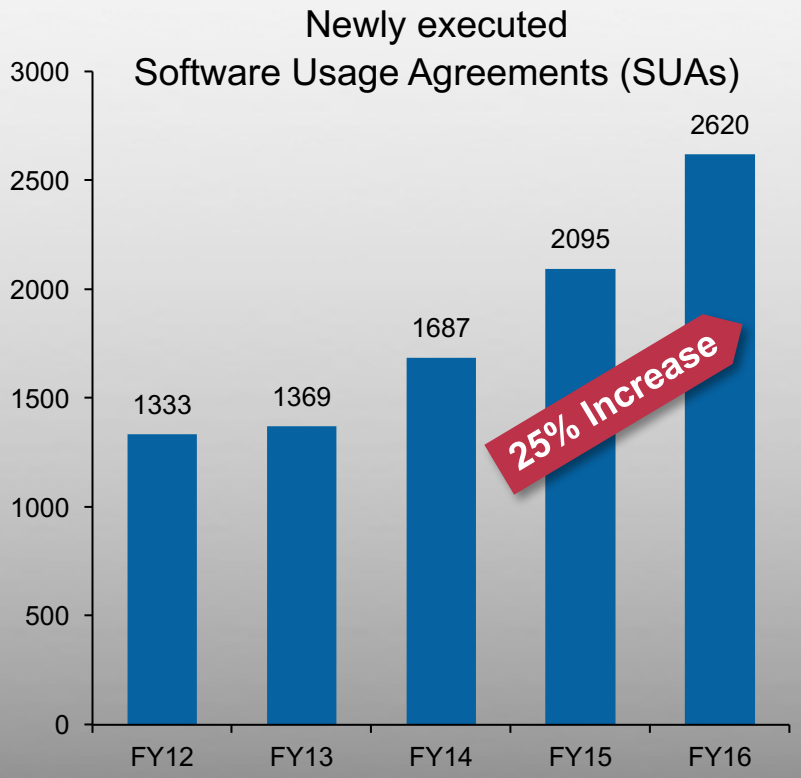
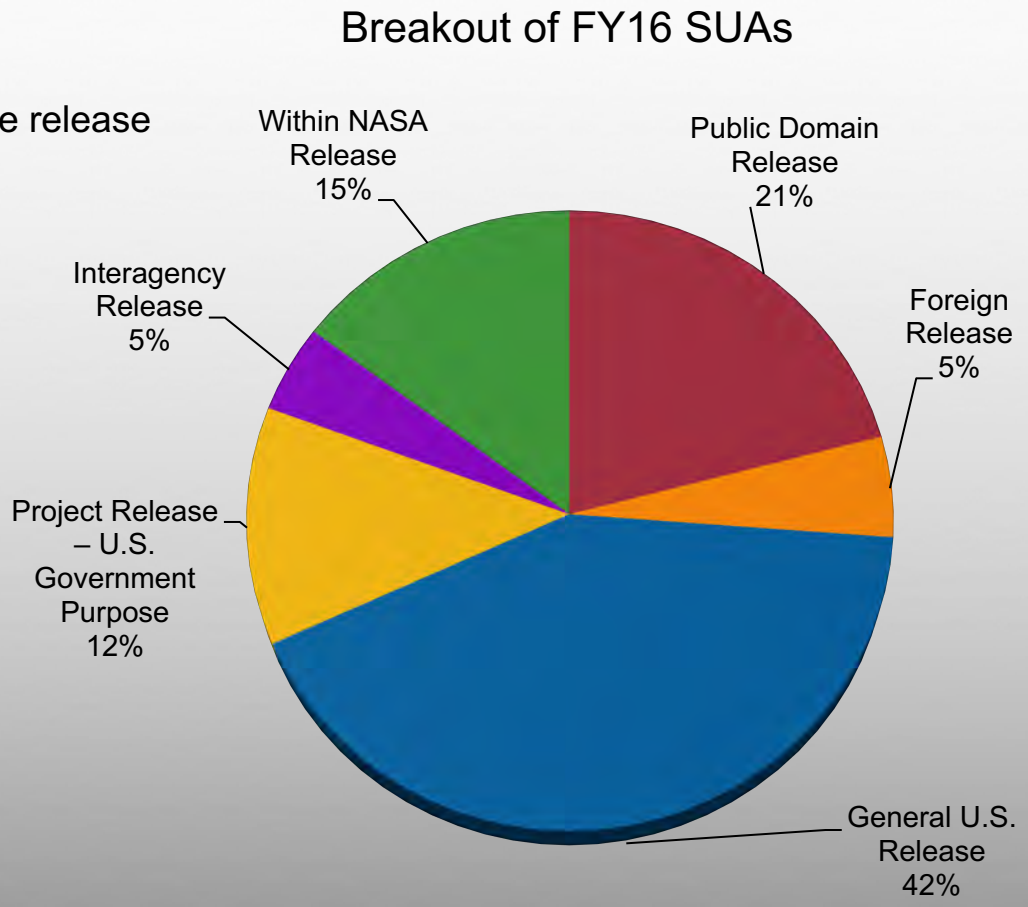
Software release is a continued success for the Technology Transfer Program

- Updated Software Catalog
- Increased outreach
- Automated processes
- Streamlined policies
- Leading interagency working group on software release





Agency Software Release Metrics

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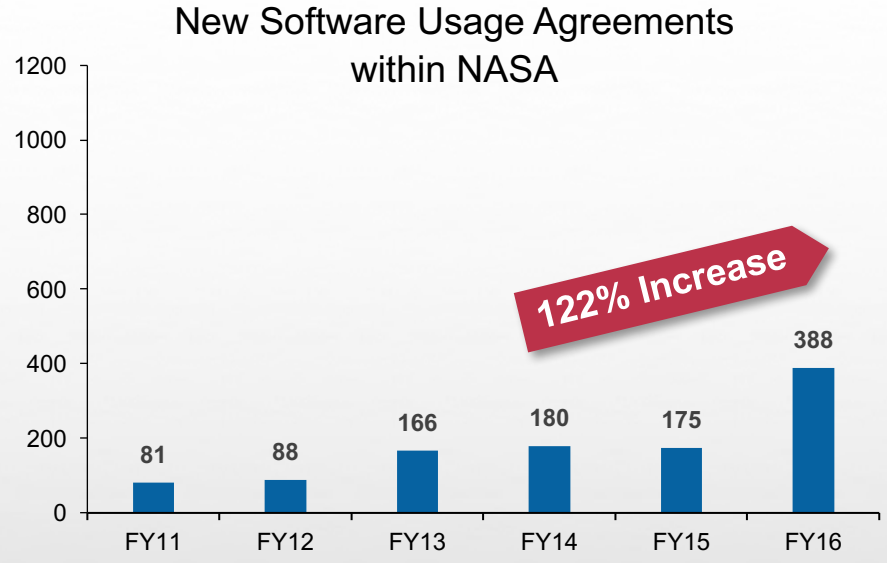

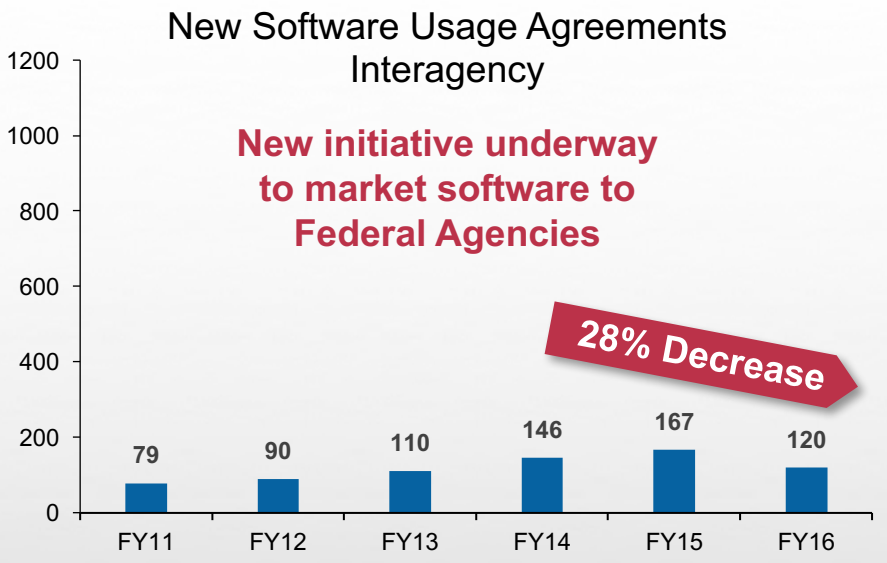

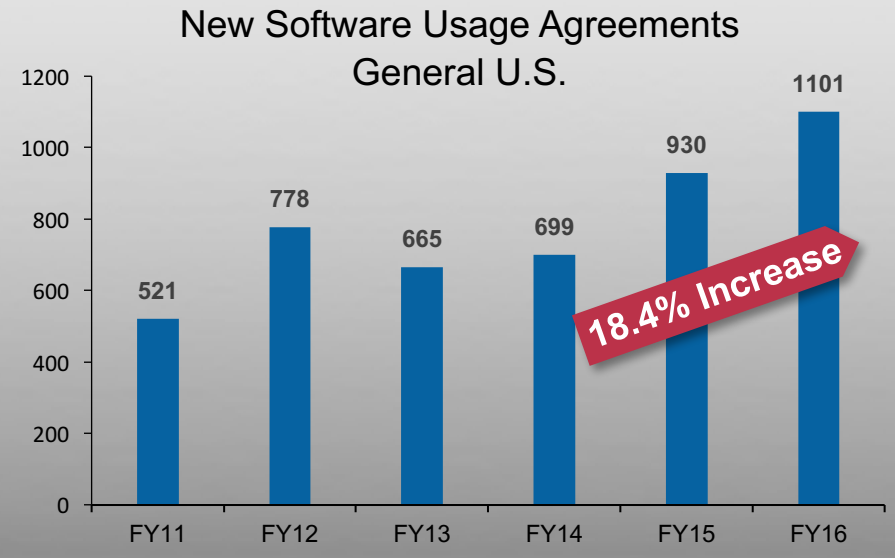

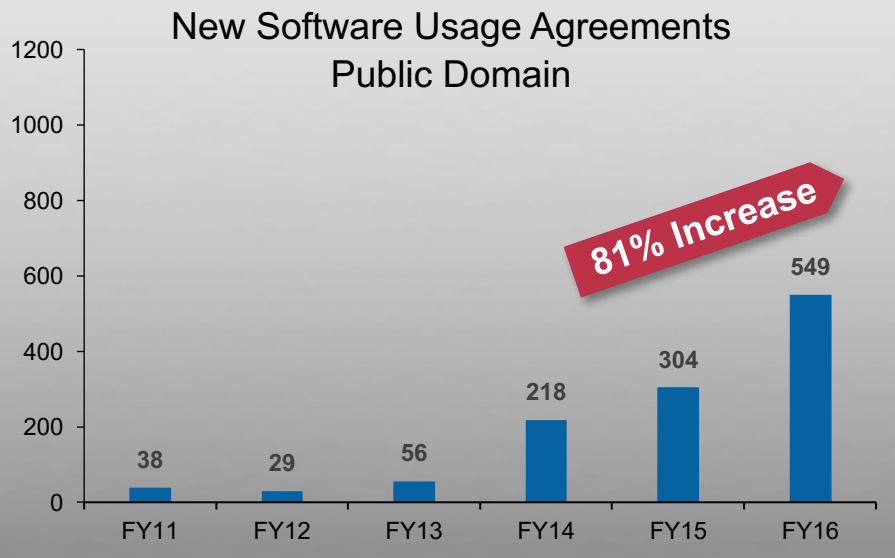

Software Release Accomplishments

- Published 2017-18 Software Catalog in February (Social Media push scheduled for March 2)
- Developed and deployed a Software Release System in September 2016 to reduce the burden of the software release approval process
- Partnered with NASA counter intelligence to address security issues related to software release
- Leading Interagency Working Group on Software Release

Software Release Authority Working Group Face-to-Face Meeting May 2016 at Ames

Software Release System

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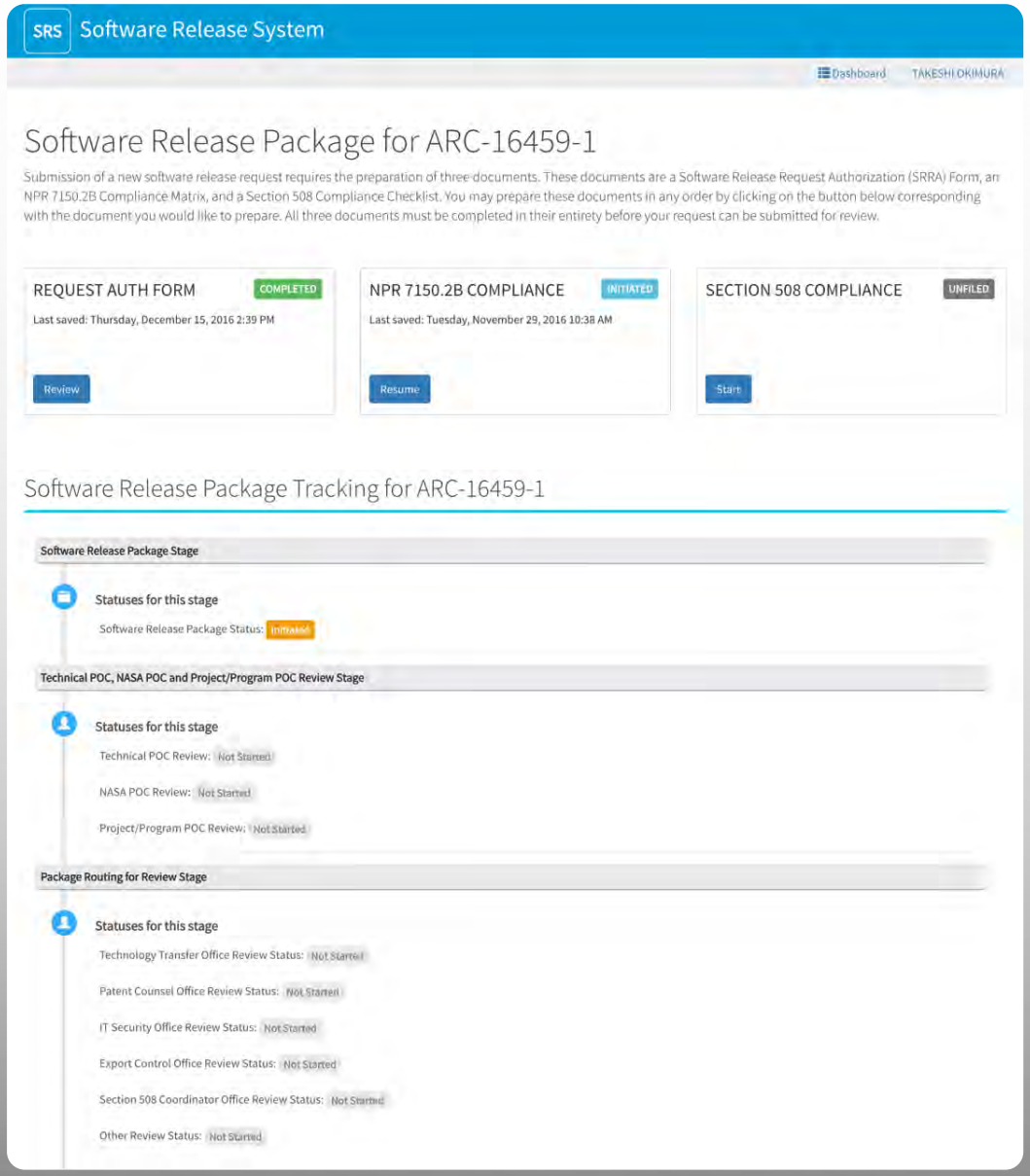
By popular demand…

- Electronic document routing system to assist in streamlining and automating agency software release process
- Increase efficiency by routing software release requests in parallel, replacing manual, serial review process
- Improve metrics capture, allowing problems in the release process to be identified and corrected in a timely manner



NASA Spinoff Publication

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Spinoff 2017 launched December 5, 2016

- Highly successful launch campaign involving support from entire agency
- Features 50 companies located in 22 different states

Companies profiled in Spinoff 2017

Spinoff Team.
Left to right:
Naomi Seck,
Science Writer
John Jones,
Senior Graphic Designer
Mike DiCicco,
Senior Science Writer
Daniel Coleman,
Managing Editor

Spinoff Communications

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Audience Reach

- Millions of web hits every month
- 200,000 followers on social media
- 10,000 print copies distributed to stakeholders, members of Congress, members of public
- Searchable database containing 2,000 spinoff technologies published in *Spinoff* since 1976

NASA Tech Briefs Magazine

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- NASA Tech Briefs has been in continuous publication since 1976
- The publishing and information distribution landscape has changed significantly in that time
- As of May 2017, NASA will no longer have a formal relationship with the Tech Briefs Publishing Group
- The magazine will continue as “Tech Briefs” but no longer use the NASA name or insignia. NASA will continue to submit content on new technology transfer opportunities, participate in sponsored webinars

Portal, Software and Spinoff Web Hits

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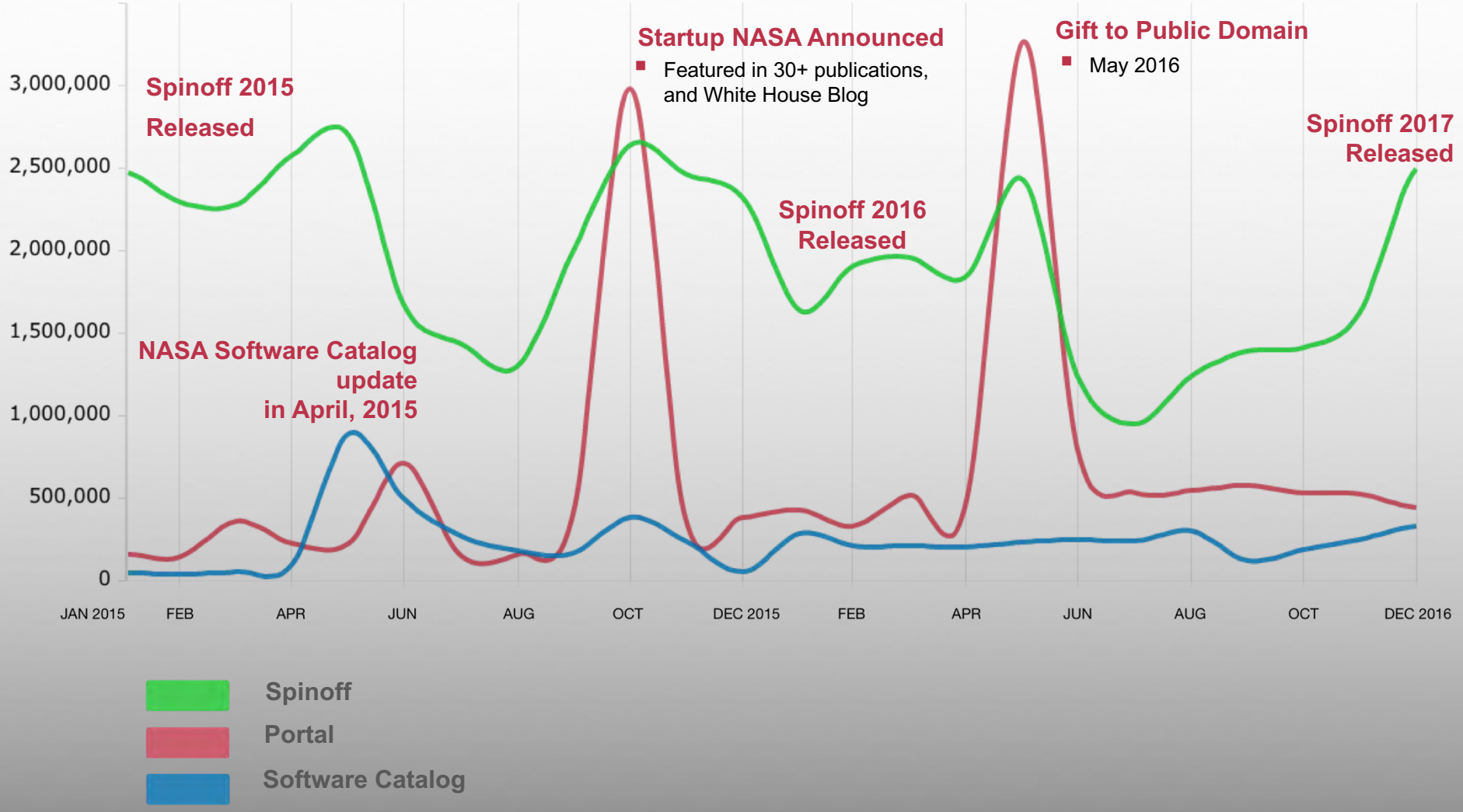
January 2015 through December 2016

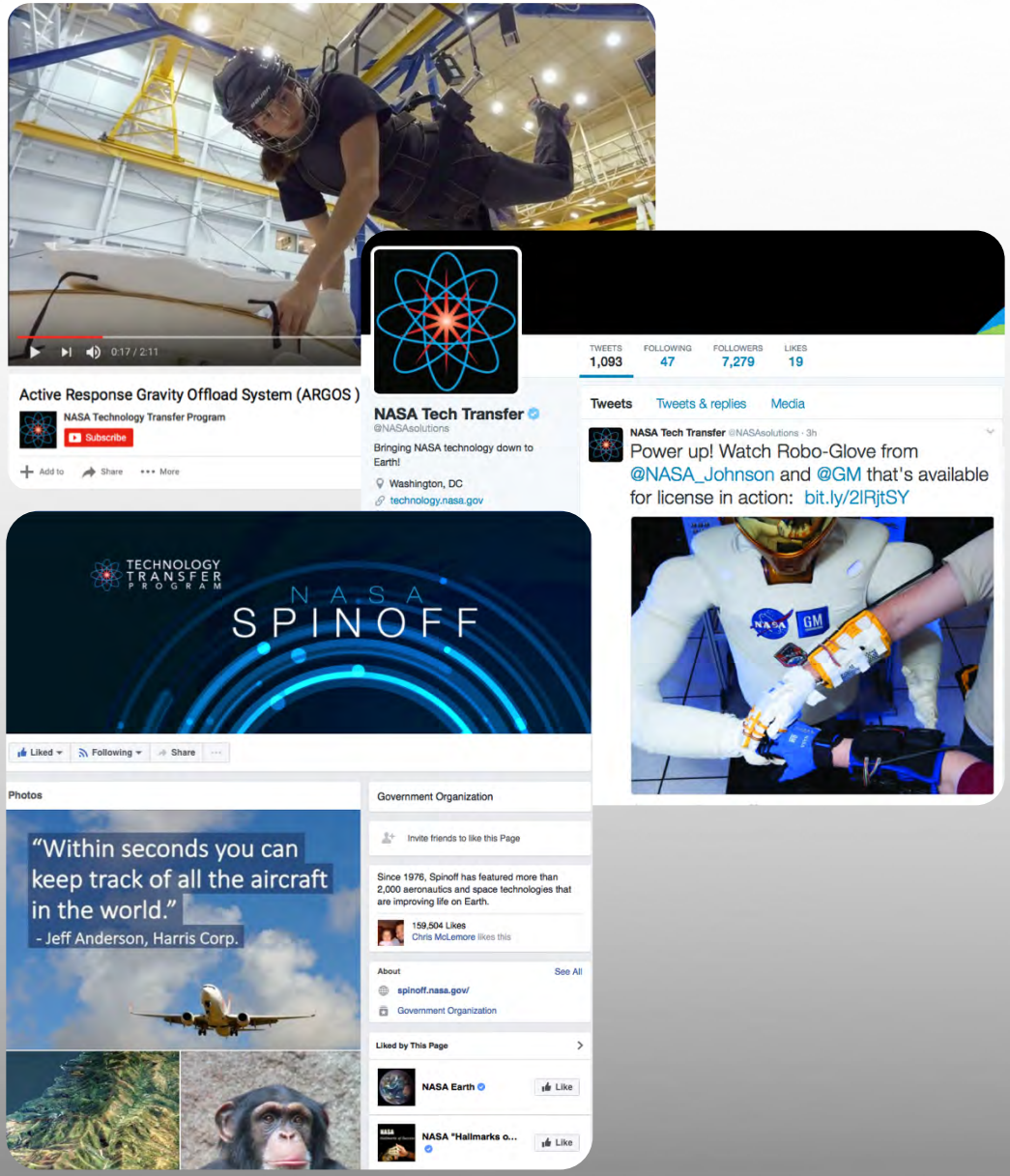


T2 Program Social Media

TECHNOLOGY TRANSFER PROGRAM

- All center Twitter accounts have been consolidated into one: @NASAsolutions
- This account, along with the @NASASpinoff account, is updated multiple times weekly
- Coordinate with Agency Social Media team to widely promote announcements such as new Software Catalogs or new program initiatives
- NASA Technology Transfer YouTube channel houses all marketing videos

T2 Social Media Tracking		
Social Media Site	Followers / Likes / Views	Date
@NASAsolutions	7,281	2/15/17
@NASAspinoff	59,000	2/15/17
Tech Transfer Linked In	6,345	2/15/17
NASA Spinoff Facebook	159,473	2/15/17
Tech Transfer YouTube	16,155	2/15/17



2017 Conferences and Exhibits

TECHNOLOGY TRANSFER PROGRAM

Consumer Electronics Show
Jan 5-8 Las Vegas, NV

Society of Automotive Engineering World Congress
April 4-6 Detroit, MI

Offshore Technology Conference
May 1-4 Houston, TX

Society for the Advancement of Material and Process Engineering
May 22-25 Seattle, WA

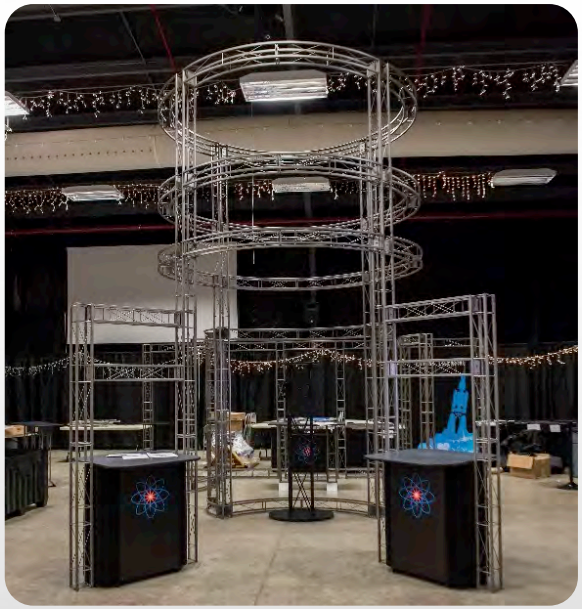
TechConnect
May 14-17 Washington, D.C.

Internet of Things World
May 16-18 San Jose, CA

Sensors Expo
June 27-29 San Jose, CA

Composites and Materials Expo
Sept 11-14 Orlando, FL

Carson Davis from MSFC works the booth at DC Startup Expo on October 25, 2016.



New 20x20 booth, shown without panels.

The current Tech Transfer booth set up at the 2016 CAMX conference.

NASA Technology Transfer System

Supporting the NASA Technology Transfer Program for over 20 years.

NTTS is the gold standard technology transfer management tool. Currently in the process of sharing code with USAF and NIH.

Capturing Information

Internal to NASA: NASA Inventors • Inventions and Contributions Board • Partnership Managers • Patent Counsel • Spinoff • SRA Working Group • Licensing executives
External to NASA: Contractors, Grantees• General Public • Potential Licensees • Software Users • Academic Institutions

Workflow & Content Management

Subjects: Technology Reporting • IP Protection • Marketing • Software Release • Tech Transfer • Licensing • Leads • Contracts & Grants • Success Stories • Partnerships • Recognition and Awards

Marketing Communication

Products: TOPS • T2 Portal • T2 Center Websites • Patent Portfolio iPad App • Gift to Public Domain • Software Catalog • Spinoff Database • QuickLaunch

Reporting & Visualization

Products: T2 Program Metrics • T2P Metrics Dashboard • T2P National Impact Map • Technology Transfer Report to OMB • Innovator Dashboard

FY16 NTTS Improvements

TECHNOLOGY TRANSFER PROGRAM

Marketing Communication

- e-NTR and QuickLaunch Redesign
- Launched T2P Gift to Public Domain Database
- Launched T2P AFRC, KSC and LaRC Websites
- Patent Portfolio iPad App Released
- NTTS TOPS Update (Crop and Bleeds)

Process Streamlining

- Released v2.1 and v2.2 updates for Software Repository
- Launched Software Release System

Reporting

- Launched T2P Metrics Dashboard
- Launched T2P National Impact Map
- Released v2 update for T2 Program Metrics
- Launched Innovator Dashboard

System Framework

- Released NTTS Database Revamp
- Released NTTS and e-NTR Security Updates
- Hardware Upgrades

FY17 NTTS Improvement Plans

TECHNOLOGY TRANSFER PROGRAM

Improve the usability and efficiency of NTTS in order to reduce learning curve and increase productivity

Phased Improvement Strategy

- **Phase 1: Overhaul Data Infrastructure**

  (Completed in FY16) Upgrade database environment to promote more agile development and scalable operations. Tune-up search API to improve performance and enhance searching across multiple data repositories. Virtualize database infrastructure environment to replicate and deploy multiple instances if needed.

- **Phase 2: Gather Insight and Identify**

  (In Progress) Identify existing issues by reviewing development tickets and surveying users. Review current system usage and user behaviors of current system. Analyze data to identify common issues to be addressed in future development.

- **Phase 3: Targeted Development for Organizational Segments**

  Develop “NTTS Workspaces” for individual segments: Data Analysis, NTR, Software, License, Patent, Marketing and Business Communications, etc.

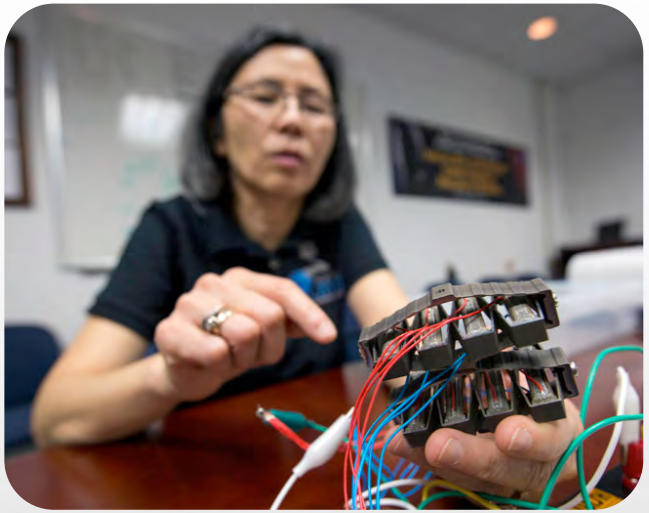
- **Phase 4: Incremental Parallel Deployment**

  Phased rollout of NTTS Workspaces to run in parallel with existing interfaces.

Annual Program Goals

TECHNOLOGY TRANSFER PROGRAM

- Annual Program Goals (APGs) are tasks assigned to teams to further improve the program in the categories of:
  - New Technology Reporting
  - Marketing
  - Increase Patent Licensing
  - Software Release
  - Program Infrastructure
- Teams develop milestone tasks to be completed on schedule to ensure the goal is completed within the year
- Monthly teleconferences are held among the program to ensure tasks are met
- The main focus of this year's APGs is **to increase New Technology Reporting** among the centers
- This year, several APGs involve complimentary programs/offices (OGC, SBIR, STI)



Langley piezoelectric energy harvesters

Hysense LLC is now manufacturing and distributing KSC's Hydrogen Leak Detection Tape

FY2017 T2 Annual Program Goals

TECHNOLOGY TRANSFER PROGRAM

New Technology Reporting

- 1a – Automate IP Notices to Contractors – JSC / Charlene Gilbert
- 1b – Modernize e-NTR Interface – KSC / Dave Makufka
- 1c – Correct Under-reporting of Invention Disclosures by Prime Contractors – MSFC / Terry Taylor, JSC / Charlene Gilbert

Marketing

- 2a – Develop Customer Relationship Management (CRM) Module – LaRC / Kathy Dezern
- 2b – Coordinate Program Exhibit Strategy – MSFC / Terry Taylor
- 2c – Design and Implement Promotion Campaign for 2017/18 Software Catalog and Repository – MSFC / Danny Garcia
- 2d – Develop a Method for Continued Engagement with Tech Transfer Portal Users – LaRC / Kathy Dezern, Jennifer Viudez
- 2e – Create Linkages with Public NASA Scientific and Technical Information to Build a Library – SSC / Duane Armstrong

Increase Patent Licensing

- 3a – Design and Build Version 2 of ”TurboTax” Licensing System - ARC / Trupti Sanghani

Software Release

- 4a – Update Software Catalog – MSFC / Danny Garcia, Barb Fawcett
- 4b – Develop and Deploy Materials to Direct Developers Who Want to Release Software – MSFC / Danny Garcia, Barb Fawcett
- 4c – Develop Toolkit of Remote Sensing Applications – SSC / Duane Armstrong

Program Infrastructure

- 5a – Improve NTTS – ARC / Tek Okimura
- 5b – Explore NSF iCorps Program and Take Advantage of Offerings – JSC / Jack James
- 5c – Create Fund for Center T2 Offices to Compete for Resources to Increase the Commercial Readiness of High-Potential Technologies – AFRC / Laura Fobel
- 5d – Collaborate and Create Linkages with SBIR Program – HQ / Dan Lockney

Legend: On Track | Concerns | Need Help

September T2 F2F with OGC

TECHNOLOGY TRANSFER PROGRAM

- Joint Meeting (first ever) of Tech Transfer and Agency Patent Counsel – September 13-15, 2016
- Set Program Goals for FY17
- Tech Transfer Best Practices and Benchmarking Session with DOE's National Renewable Energy Laboratory in Golden, CO
- Second annual joint meeting planned for October 2017

Center Tech Transfer Officers met with Center Patent Counsel in September, 2016

Benchmarking

TECHNOLOGY TRANSFER PROGRAM

T2P met with various University Tech Transfer offices to share best practices in Technology Transfer

- NOLA Area – UNO, Tulane, Loyola
- Nashville – Vanderbilt
- Research Triangle, North Carolina – UNC, Duke, NC State
- Orlando Area – UCF, Embry Riddle, FIT, FIU
- Portland, OR – UO, OSU, OSHU, PSU
- Denver, CO – NREL
- March 2017: University of Texas
- October 2017: Los Alamos National Laboratory, Santa Fe, NM

NASA is Sharing its Technology Transfer Expertise with other Federal Agencies

- Air Force
- NIH Cancer Institute
- Department of Energy
- Veterans Administration
- Leading interagency working group on software release

Tech Transfer Face-to-Face Meeting, University of Oregon, June 15, 2016

Backup

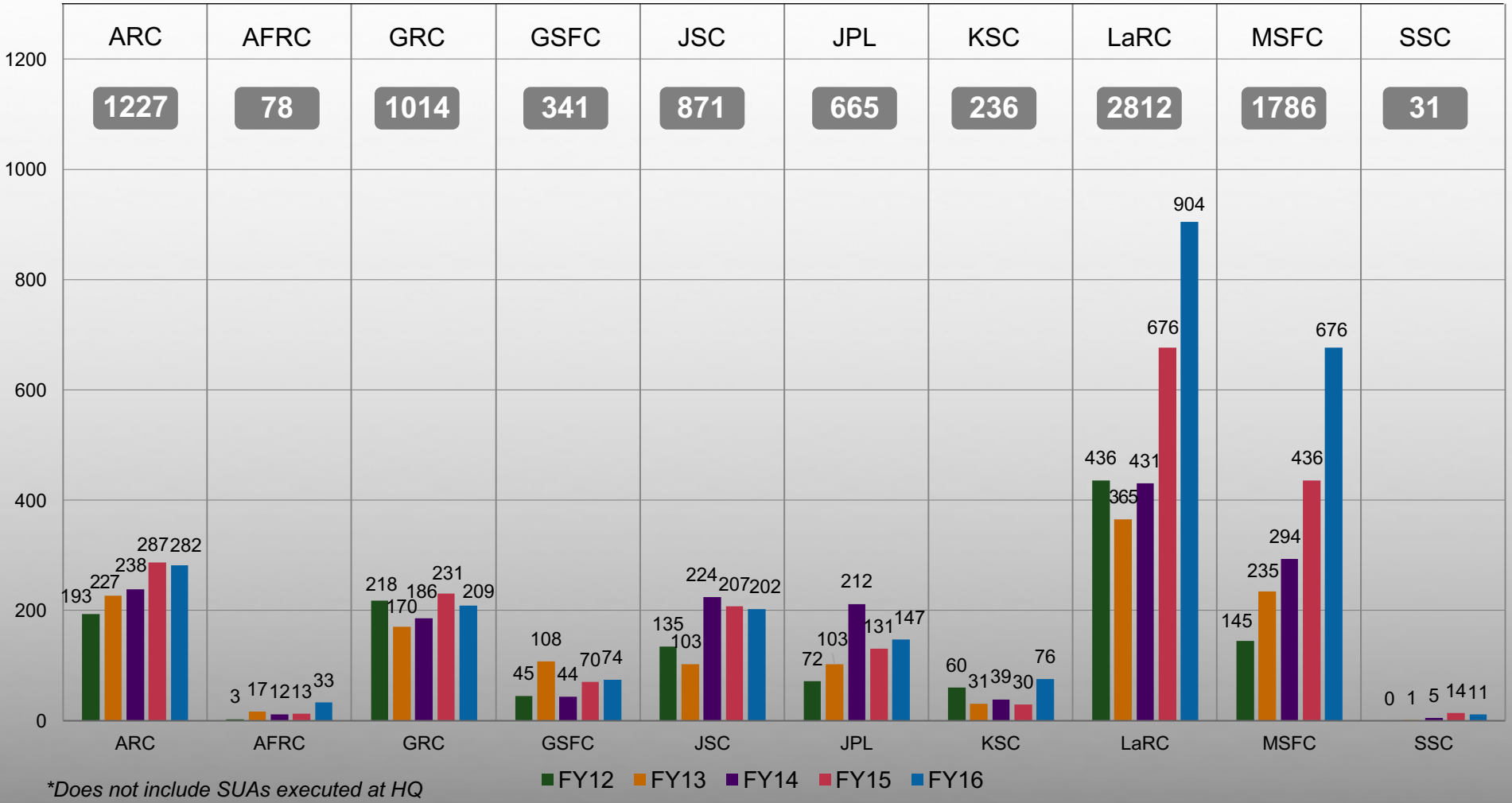
Software Release Trends by Center*

TECHNOLOGY TRANSFER PROGRAM

9061 Software Usage Agreements (SUAs) over 5-year period

FY16: 2620 SUAs Executed

5-year totals



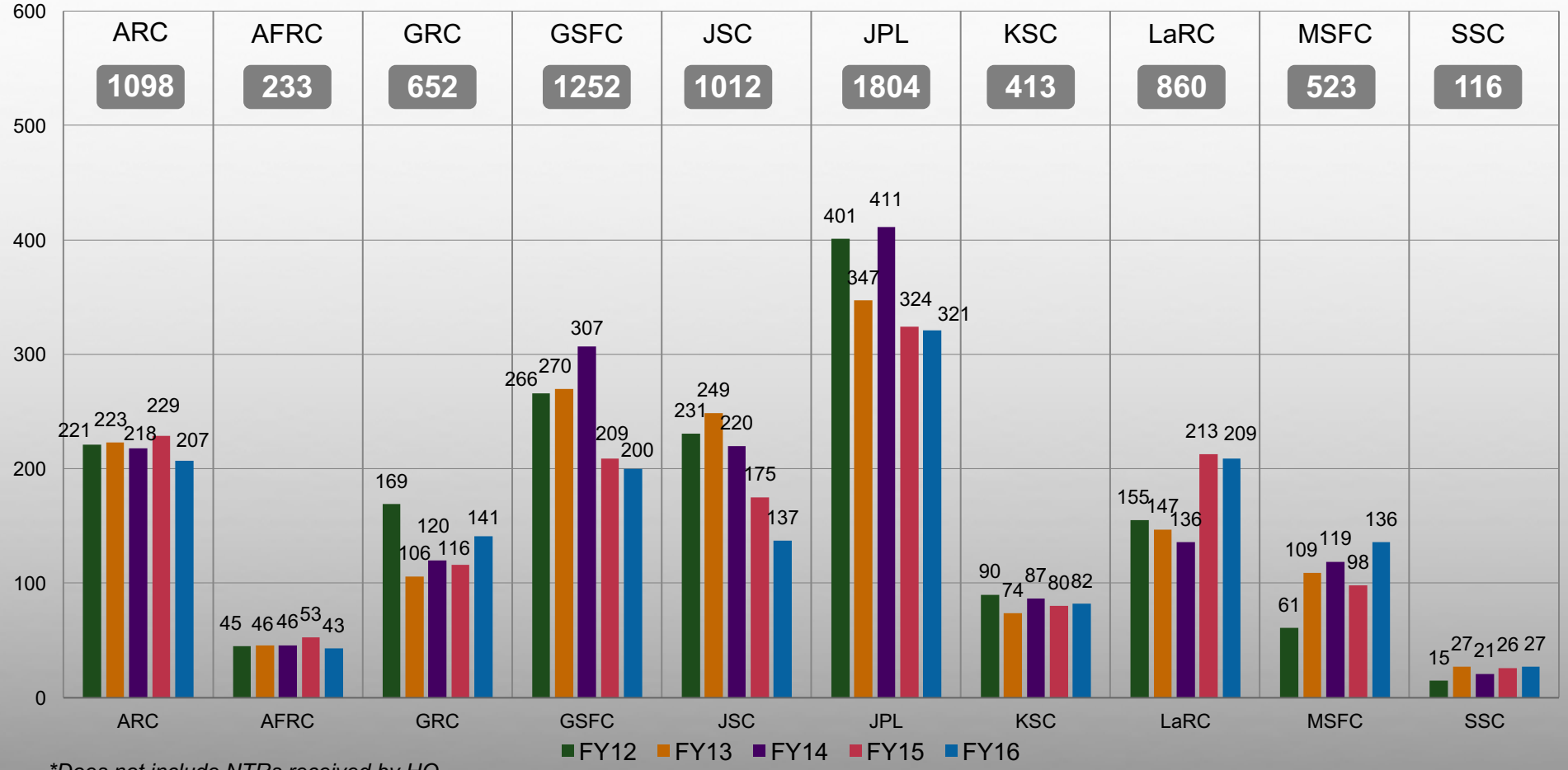
*Does not include SUAs executed at HQ

NTR Trends by Center*

7963 technologies reported over 5-year period

TECHNOLOGY TRANSFER PROGRAM

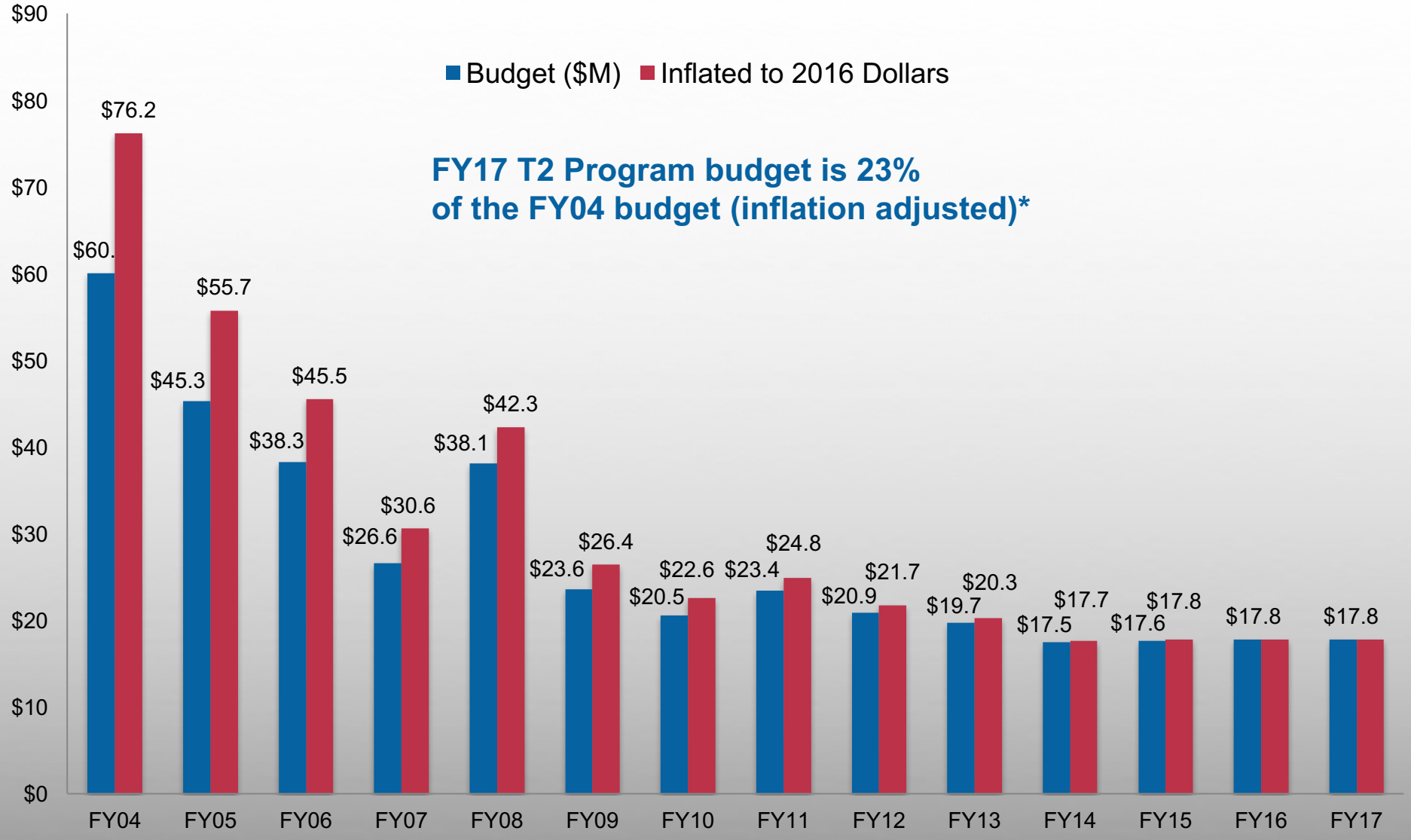
FY16: 1503 NTRs Received



*Does not include NTRs received by HQ

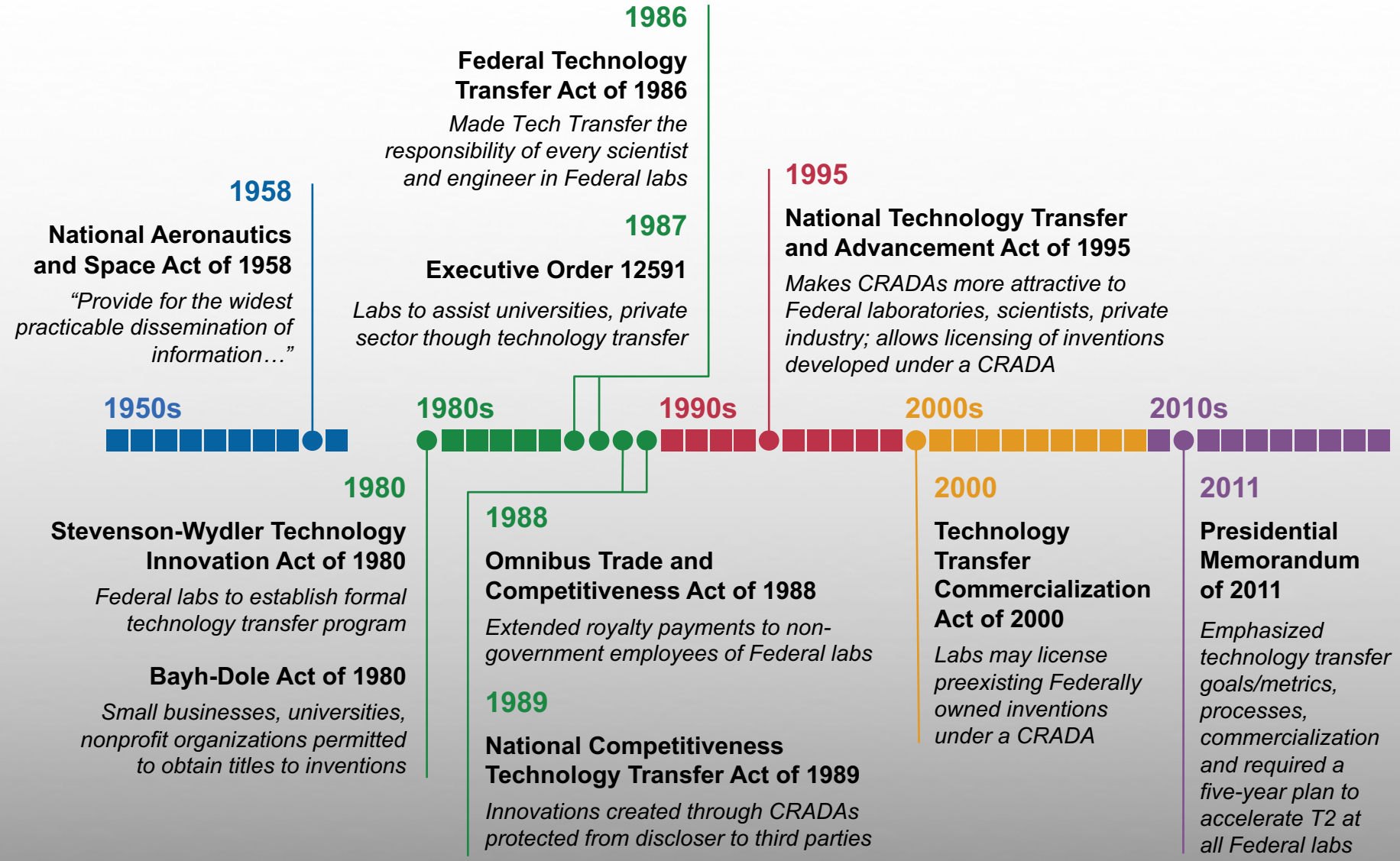
T2 Program Budget History

TECHNOLOGY TRANSFER PROGRAM



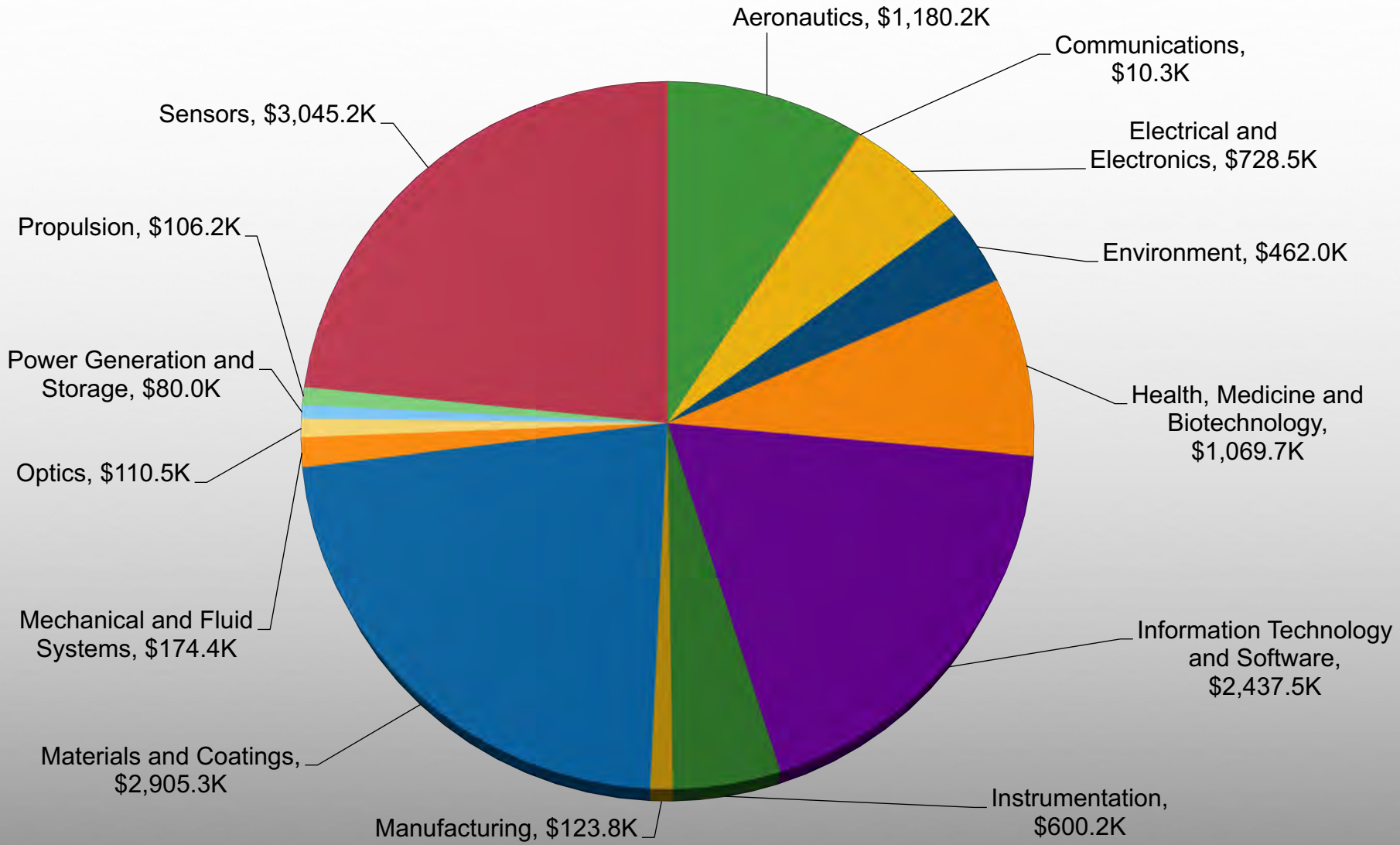
*Source: Bureau of Labor Statistics CPI Inflation Calculator http://www.bls.gov/data/inflation_calculator.htm

T2 Legislative Authority

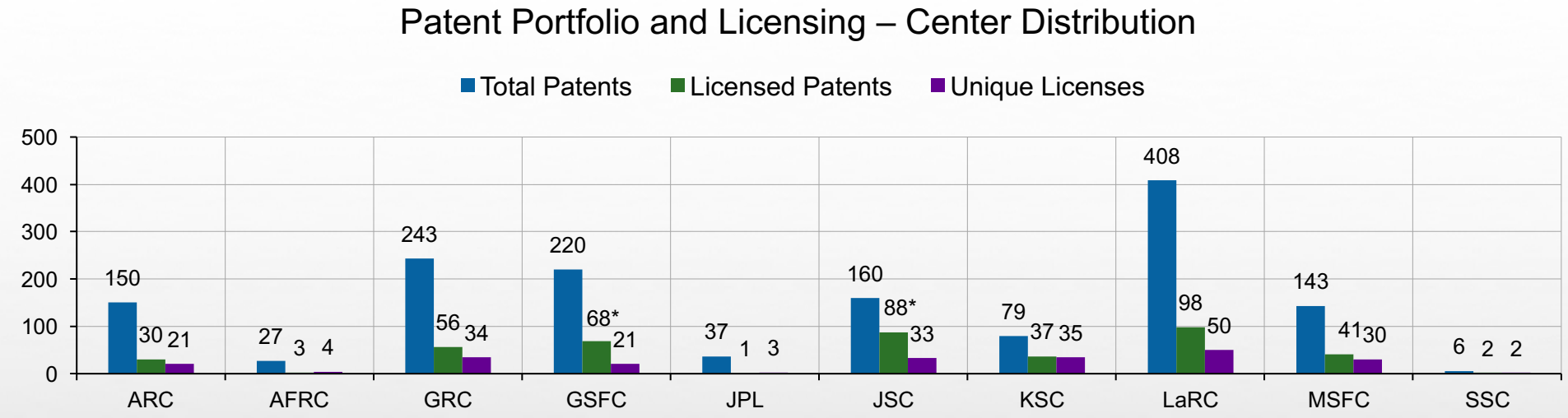


Lifetime Royalty Earnings of Active Licenses by Patent Portfolio Category

TECHNOLOGY TRANSFER PROGRAM

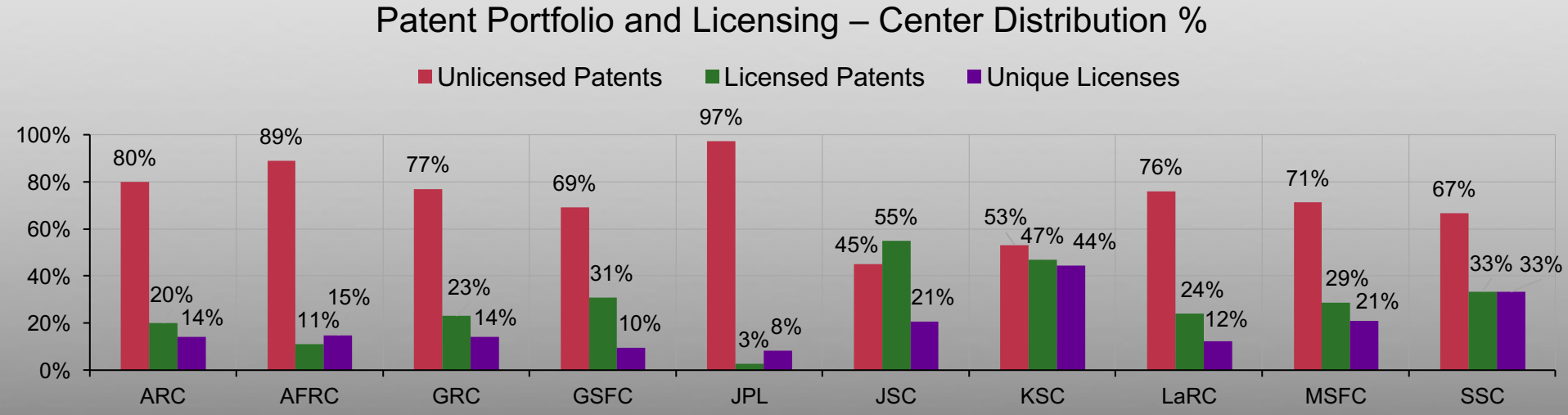


Percentage of Portfolio Licensed



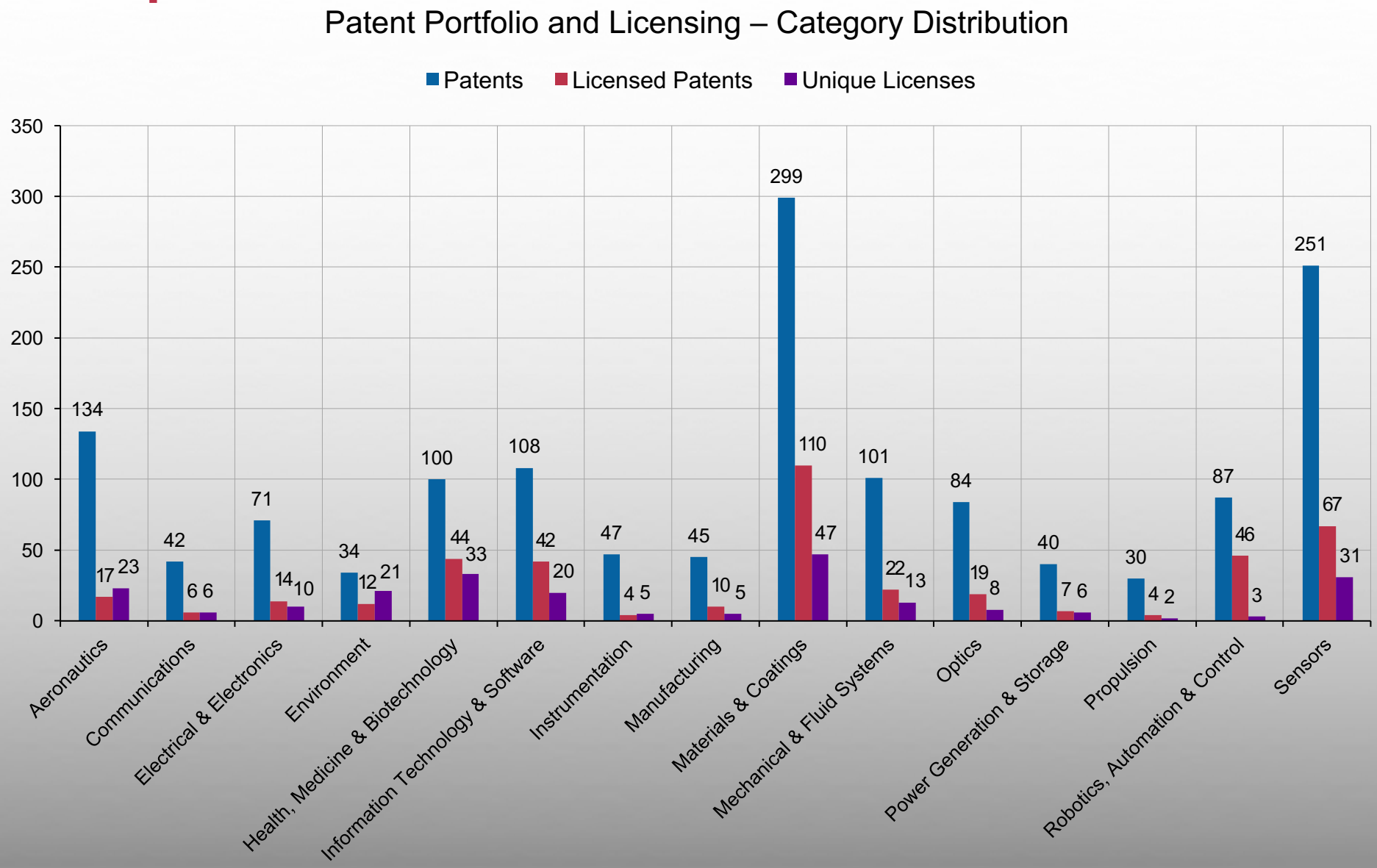
*GSFC (DE-503, exclusive), 34 patented technologies are associated with this license.

*JSC (DJ-119, joint ownership), 33 patented technologies are associated with this license (43 total technologies).



NASA License Analysis
Compare with chart 19

TECHNOLOGY TRANSFER PROGRAM



Digital Portfolio

Centralized

Offering the full agency portfolio of active patents and patents pending from 10 field centers to the public through the NASA Technology Transfer Portal at http://technology.nasa.gov

Categorized

Entire patent portfolio sorted into 15 technology categories, ranging from robotics to manufacturing, and assessed for maturity and commercial potential.

Integrated

Integrated with the NASA Technology Transfer System to automatically publish new patents daily. Integrated with the NASA Patent Portfolio iPad App to publish portfolio across various digital media.

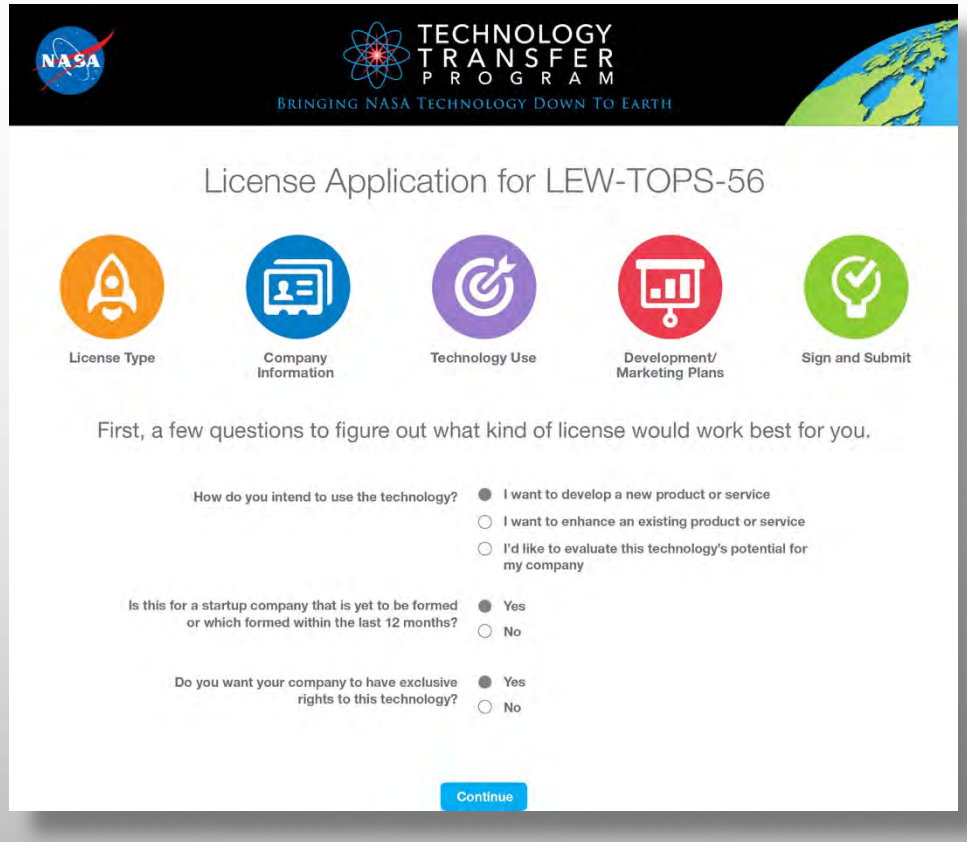
Patent Summary

- **Detailed Summary**

  Learn more about the patented technology through a detailed summary that includes: Technology Description, Suggested Applications, Potential Benefits and Publications.

Simply click the "Apply Now to License This Technology!" to begin the application process.

Electronic Application Form



- **Guided Experience**

  Simple and interactive user experience design to guide applicants through a step-by-step application process.

- **Online Solution**

  Saves time by eliminating manual processing of license applications from various field centers.

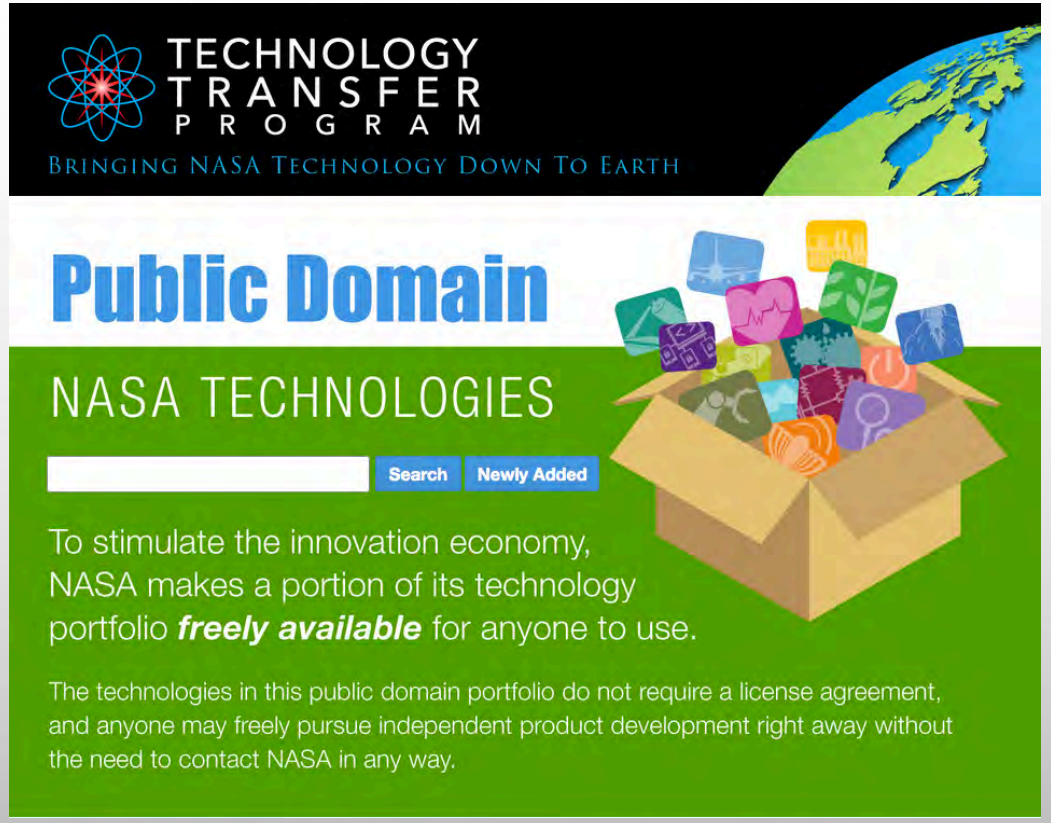
- **Easy Submission**

  Provides a paperless application submission through the use of digital signatures.

Patent Gift to Public Domain

TECHNOLOGY TRANSFER PROGRAM

- **Released a carefully-selected portfolio of patents and pending patents to the public domain on May 4th.**
- **A new searchable page of the Portal went live during announcement that includes these technologies as well as access to over 6,000 expired NASA patents.**
- **OGC decided that inventors will not be formally notified.**
- **Goals:**
  - Encourage increased use, further development, and increased collaborative development of space-focused technologies.
  - Capitalize on emerging commercial space industry's high near-term potential for explosive growth.
  - Makes tech more cost-effective for industry to use and develop.
  - Helps next generation of space companies form and grow through creatively using these early-stage techs.
  - NACA-like approach to help build an emerging industry.
  - Free up Technology Transfer Program resources (money and personnel) to focus on technology with broader commercial potential.



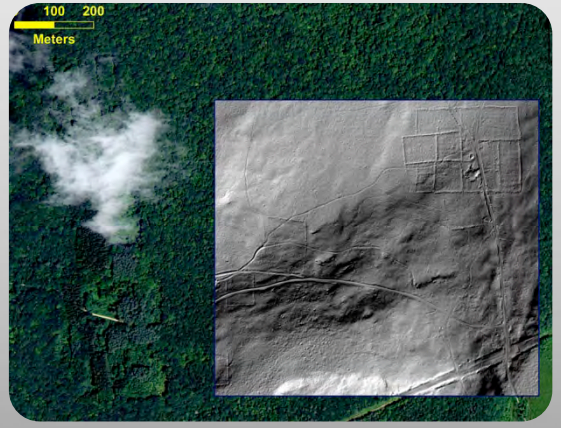
Spinoff 2017 Highlights

TECHNOLOGY TRANSFER PROGRAM

GPS Correction Technology Lets Tractors Drive Themselves

Rocket Technology Stops Shaking in Its Tracks

Video Cameras for Orion Push Limits of High-Speed Memory



Mars Lidar Leads to Archaeological Discoveries

CMOS Sensors Take Over Digital Image Industry

Mini Heat Pipes Wick Away Heat in Brain Surgery

Awards and Highlights

FY16 Agency Honor Awards

GRC's Karen Bartos was presented with the "Exceptional Service Medal" at the NASA GRC Honor Awards in August, 2016.

- **Karen Bartos (GRC) NASA Exceptional Service Medal**
- **Pale Hale (MSFC) NASA Exceptional Public Service Medal**

STMD AA Steve Jurczyk and MSFC Center Director Todd May present Paul Hale with the "NASA Exceptional Public Service Medal" at the Marshall Honor Awards on July 8, 2016.

2016 FLC Awards

TECHNOLOGY TRANSFER PROGRAM

- Regional "Coordinators Excellence Award"
  Kim Dalgleish-Miller (GRC)
- "Notable Tech Development"
  Battery Internal Short Circuit (JSC)
- Far West Laboratory "Representative of the Year"
  Janeya Griffin (AFRC)
- "Outstanding Technology Development"
  Towed Glider Air-Launch System_(TGALS) (AFRC)
  Pegasus 5.2 (ARC)
- "Outstanding Commercialization Success"
  Sense-and-Avoid System with ADS-B Avionics for Unmanned Aerial Systems (AFRC)

Kim Dalgleish-Miller (GRC) is presented the FLC Regional "Coordinators Excellence Award"

Gerald Budd (AFRC), Jenaya Griffin (AFRC) and Ricardo Arteaga (AFRC) pose with their awards with Robert Heard from Cimarron Capital Partners.

The JSC team is presented with the FLC Regional "Notable Tech Award" for the Battery Internal Short Circuit.

Stuart Rogers (ARC) is part of the team that was awarded the FLC Regional "Outstanding Technology Development Award" for his work on Pegasus 5.2

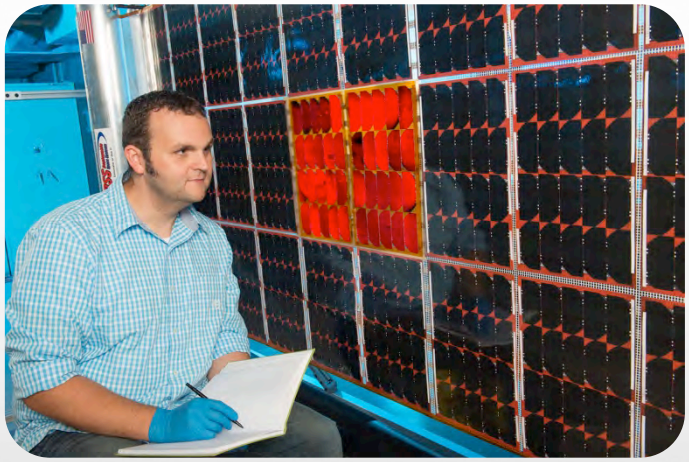
The AFRC team is presented with the FLC Regional "Outstanding Technology Development Award" for the TGALS technology.

Awards and Highlights

R&D 100

R&D Magazine

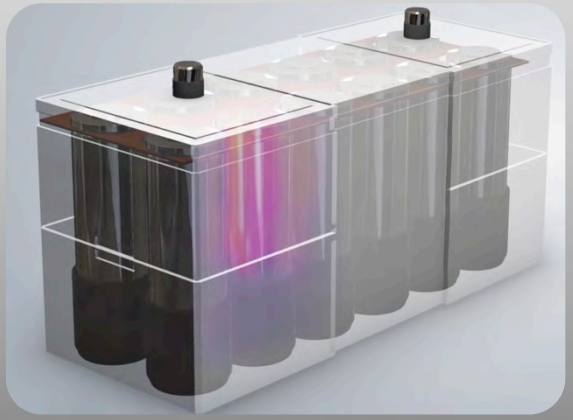
TECHNOLOGY TRANSFER PROGRAM



Jeremiah McNatt, GRC: Roll-Out Solar Array (ROSA) System along with Deployable Space Systems Inc. and the Air Force Research Laboratory – Space Vehicles Directorate.

Chris Wohl, LaRC: Contaminant Adhesion Mitigating Epoxy Composite Coatings for Aeronautic Environments

Santo Padula II, GRC: 'Training' Process for Shape Memory Alloys (SMAs)



JSC and NREL: Battery ISC Device

Awards and Highlights

KSC / LaRC

TECHNOLOGY TRANSFER PROGRAM

Florida Inventors Hall of Fame

KSC's Dr. Jacqueline Quinn was inducted into the Florida Inventors Hall of Fame. Quinn invented NASA's most licensed and recognized technology for groundwater remediation, Emulsified Zero Valent Iron (EZVI).

Space Technology Hall of Fame

LaRC's Rob Bryant is the inventor of the LaRC-SI technology, a durable thermoplastic readily fabricated in very thin form. It has been selected for induction into the Space Technology Hall of Fame. Medtronic, a medical device company, licensed LaRC-SI and has put it to use as a revolutionary insulation for the treatment of heart irregularities.

Invention of the Year

2016 Winners

TECHNOLOGY TRANSFER PROGRAM

Boron Nitride Nanotubes (BNNT)

NASA Government Invention of the Year

Langley's Boron Nitride Nanotubes (BNNT) technology has been selected as the 2016 NASA Government Invention of the Year. Team members include Michael Smith, Cheol Park, and Kevin Jordan. The winning invention includes a novel approach to synthesizing high quality boron nitride nanotubes (BNNTs) without a metal catalyst using a high pressure and temperature method.

Hydrogen Leak Detection Tape

NASA Commercial Invention of the Year

KSC's Hydrogen Leak Detection Tape Technology Wins NASA Commercial Invention of the Year. The winning technology is a chemochromic sensor that detects combustible gases such as hydrogen molded into the form of a tape.
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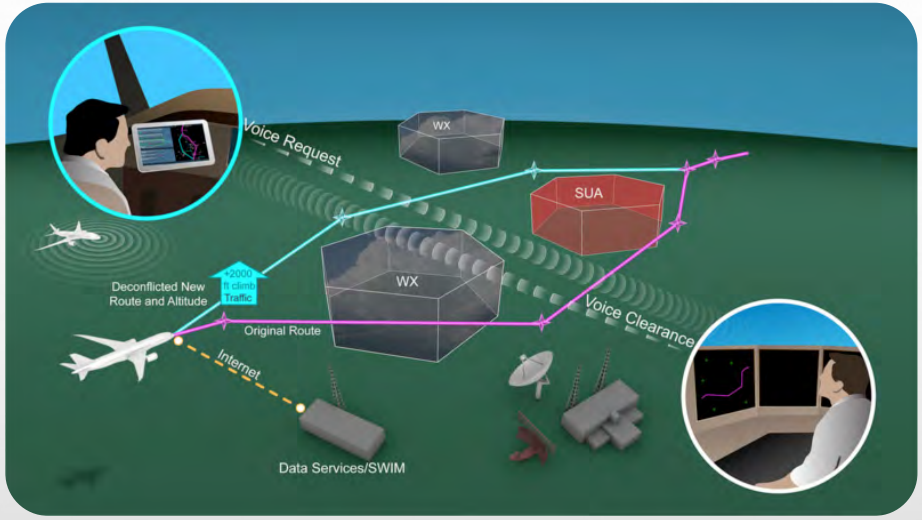
Software of the Year

2016 Winners

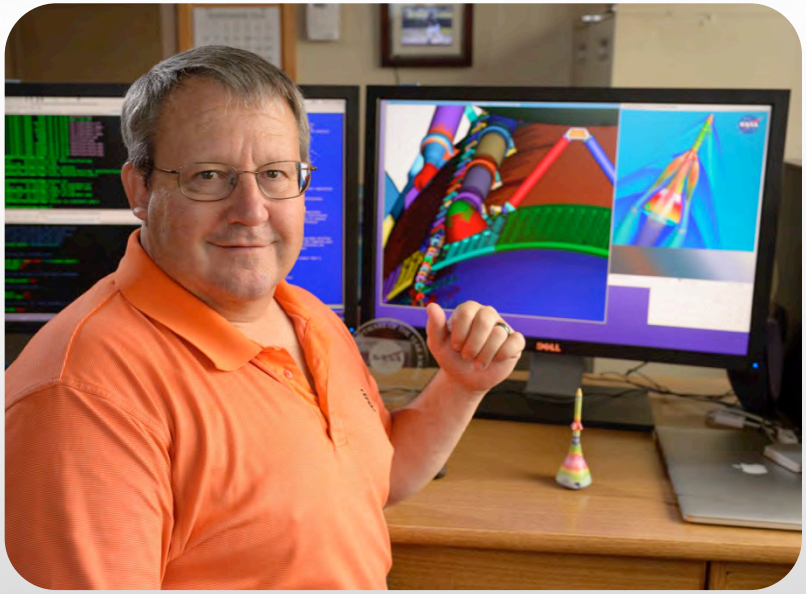
TECHNOLOGY TRANSFER PROGRAM

Traffic Aware Planner (TAP) (LaRC)



Engineer David Wing from LaRC led the research effort that delivered TAP.

Pegasus 5 (ARC)



Stuart Rogers is one of the inventors of Pegasus 5.

Runner Up:

- JSC's Generic Command and Telemetry Applications CI-TO

Honorable Mention:

- GSFC's James Webb Space Telescope Integrated Simulation Test
- JPL's Analytics Cloud
- KSC's Distributed Observer Network
- MSFC's MAG4 Magnetogram Forecast

FY2016 T2 Annual Program Goals

TECHNOLOGY TRANSFER PROGRAM

Goal 1: Revise Agency Policy and Develop Strategy

- Objective 1a: Update NPD 2090.6 to Reflect Current Licensing Procedures and Best Practices - Sammy Nabors / MSFC
- Objective 1b: Work with OGC to Update the ICB Process and Handbook - Dani Goldwater / ARC

Goal 2: : Increase New Technology Reporting

- Objective 2a – Organizations Will Conduct Monthly TT Briefings - CMT/ Ann Harkey / MSFC
- Objective 2b – SBIR / STTR Contract Closeout Project - Kim Dalgleish-Miller / GRC
- Objective 2c - Grant and Cooperative Agreement Project - Irene Cierchacki / GRC

Goal 3: Strategically Manage Intellectual Property

- Objective 3a - Gift of Space-Related Patents - Dan Lockney / HQ
- Objective 3b - Portfolio Analysis - Develop Subcategory Taxonomy - Duane Armstrong / SSC - Charlene Gilbert / JSC

Goal 4: Market Agency Technology Assets

- Objective 4a - Develop Direct Email Marketing Campaign for Technology Portfolio - David Makufka / KSC
- Objective 4b - Develop Standard Marketing Video Template - Kathy Dezern / LaRC
- Objective 4c - Evaluate Potential for Improvements to Tech Briefs Product Offerings - Nona Cheeks / GSFC
- Objective 4d - Coordinating Conference for Marketing - Laura Fobel / AFRC

Goal 5: Develop and Implement Innovative Methods for Technology Licensing

- ~~Objective 5a - Launch Start-Up License Initiative - Trupti Sanghani / ARC~~ **COMPLETE**
- Objective 5b - Conduct Survey of Active Licensees - Jim Nichols / KSC
- Objective 5c - Write Requirements for Turbo Tax Style License Application Module - Trupti Sanghani / ARC
- Objective 5d - Develop How-To Licensing Page for T2 Portal - Michelle Lewis / JSC

Goal 6: Increase Software Releases

- Objective 6a - Develop Automated Routing System to Improve Software Release Process - Danny Garcia / MSFC
- ~~Objective 6b - Implementation of Click Wrap Agreements for CS to CS Transfer of Software - Brian Morrison / JPL~~ **COMPLETE**
- Objective 6c - Form Team to Develop and Implementation Plan for SR Process Improvements - Danny Garcia / MSFC

Goal 7: Advance T2 Partnerships

- Objective 7a - Initiate and Manage Start-Up Business Plan Competition with Center for Advancing Innovation - Dalgleish-Miller/Cierchacki/Lockney
- Objective 7b - T2U Video Content - Mike Lester / KSC