National Aeronautics and Space Administration

NASA TECHNOLOGY TRANSFER PROGRAM

BRINGING NASA TECHNOLOGY DOWN TO EARTH

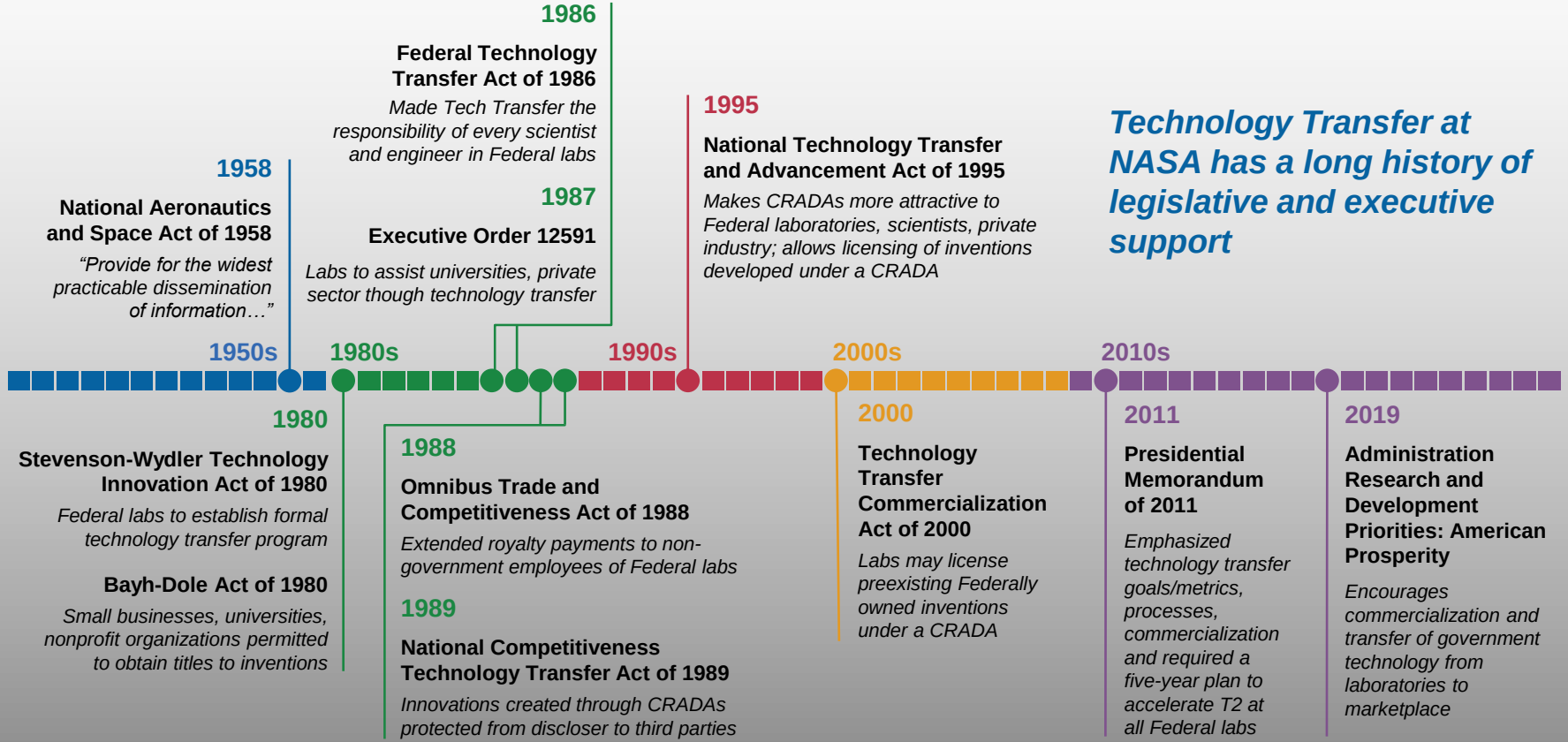
NASA Technology Transfer Overview

Dan Lockney
Technology Transfer Program Executive
May 15, 2018

T2 Legislative Authority

NASA TECHNOLOGY TRANSFER PROGRAM

Technology Transfer at NASA has a long history of legislative and executive support



T2P Organization

NASA TECHNOLOGY TRANSFER PROGRAM

NASA Technology Transfer Program Executive
(D. Lockney)

NASA HQ
- Goals and Strategy
- Policy and Leadership
- Resource Allocations

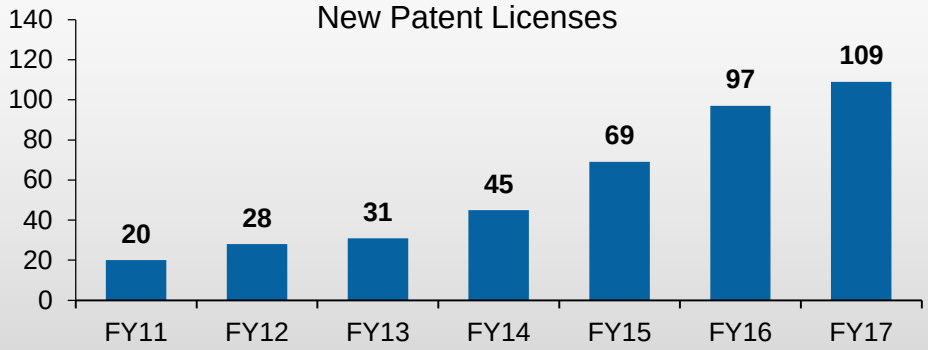
Group Leads
- Licensing: Sammy Nabors
- New Technology Reporting: Irene Cierchacki
- Software Release: Danny Garcia

Cross-Agency Support
- Project Coordinator: Ann Harkey
- Analyst: Alex Beddis
- Technical Lead: Takeshi Okimura

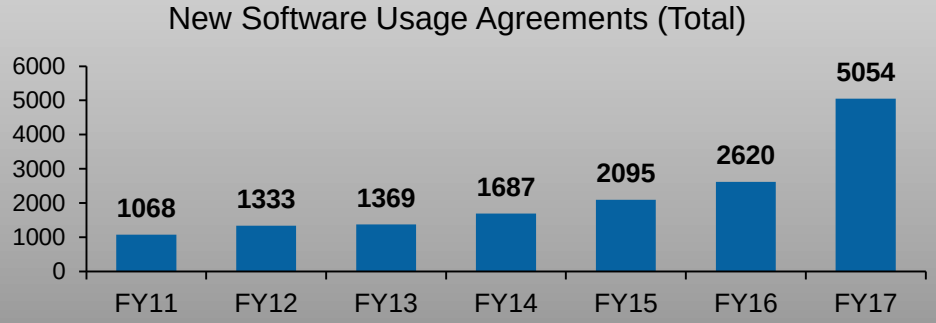
Center Functions
- CMT
- Center Specific Goals to Support HQ goals
- IP Portfolio Management
- Tech Transfer Activity
- Monitoring / Reporting

ARC (T. Strawa)
AFRC (L. Fobel)
GRC (H. Schabes)
GSFC (N. Cheeks)
JPL (D. Wolfenbarger)
JSC (C. Gilbert)
KSC (D. Makufka)
LaRC (K. Dezern)
MSFC (T. Taylor)
SSC (D. Armstrong)

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 seven 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

Since FY11, we've managed a **341% increase** in annual licensing totals and a **373% increase** in software release.

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

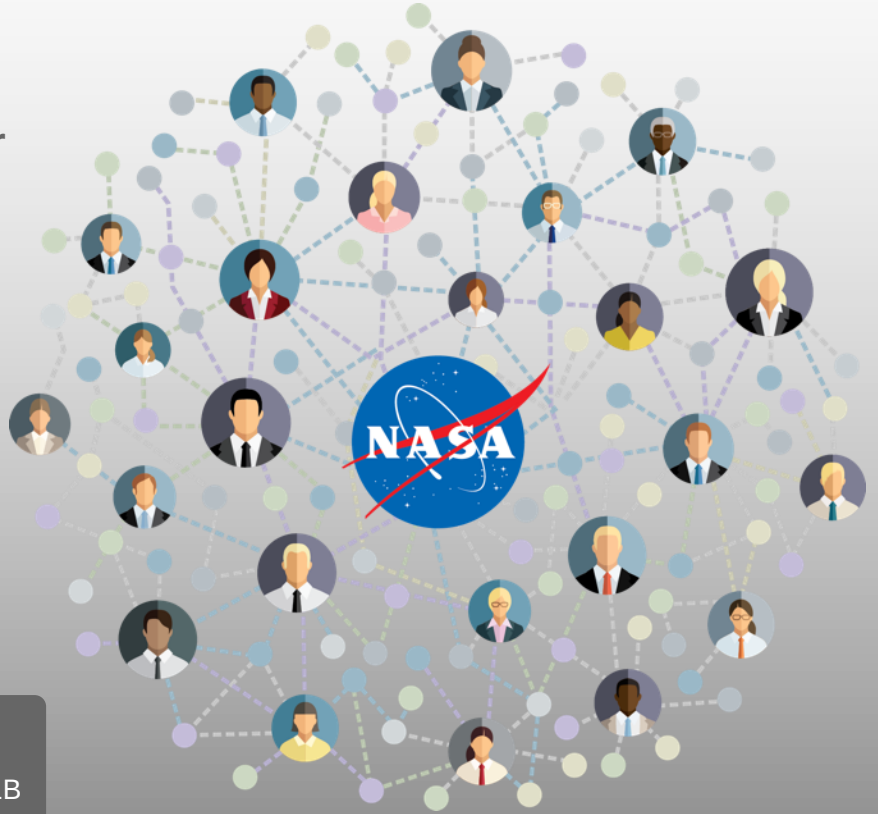
- Jobs created
- Revenue generated
- New products to market
- Quality of life improved

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

Technology Reporting Requirements

NASA 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
- 2 CFR 1800.923
- NASA Policy Directive 2091.1B

e-NTR Release and Announcement

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- The new e-NTR system is now live at **invention.nasa.gov**
- An announcement newsletter was sent to all NASA email accounts February 15th
- Guided Experience:
  - Simple and intuitive user experience design to guide innovators through a step-by-step submission process
- Improved Workflow:
  - Improved NTR submission workflow to eliminate NTRs "stuck" in review
- Enhanced Tools:
  - "Address Book" to reuse innovator information, auto-save to reduce data loss, and "Commenting" system for reviewers to make comments throughout NTR

NTR In-Reach

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Left, GRC TTO conducts training.

KSC tempts their innovators with the "Sweet Side to Reporting New Technology."

In correlation with the Technology Transfer Office Calendar, the GRC TTO staff set up in the cafeteria to talk to inventors.

4,295 New Technology Report (NTR) Training Sessions Attendees

Left and Bottom, Inventors enjoy lunch and their new coins at KSC's Inventor Recognition Luncheon.
Right, LaRC's Jesse Midgett presents NTR overview to 44 members of the Durability, Tolerance and Reliability Branch.

AFRC's Earl Adams presents to inventors about New Technology Reporting.

Inventor's Notebooks and Challenge Coins

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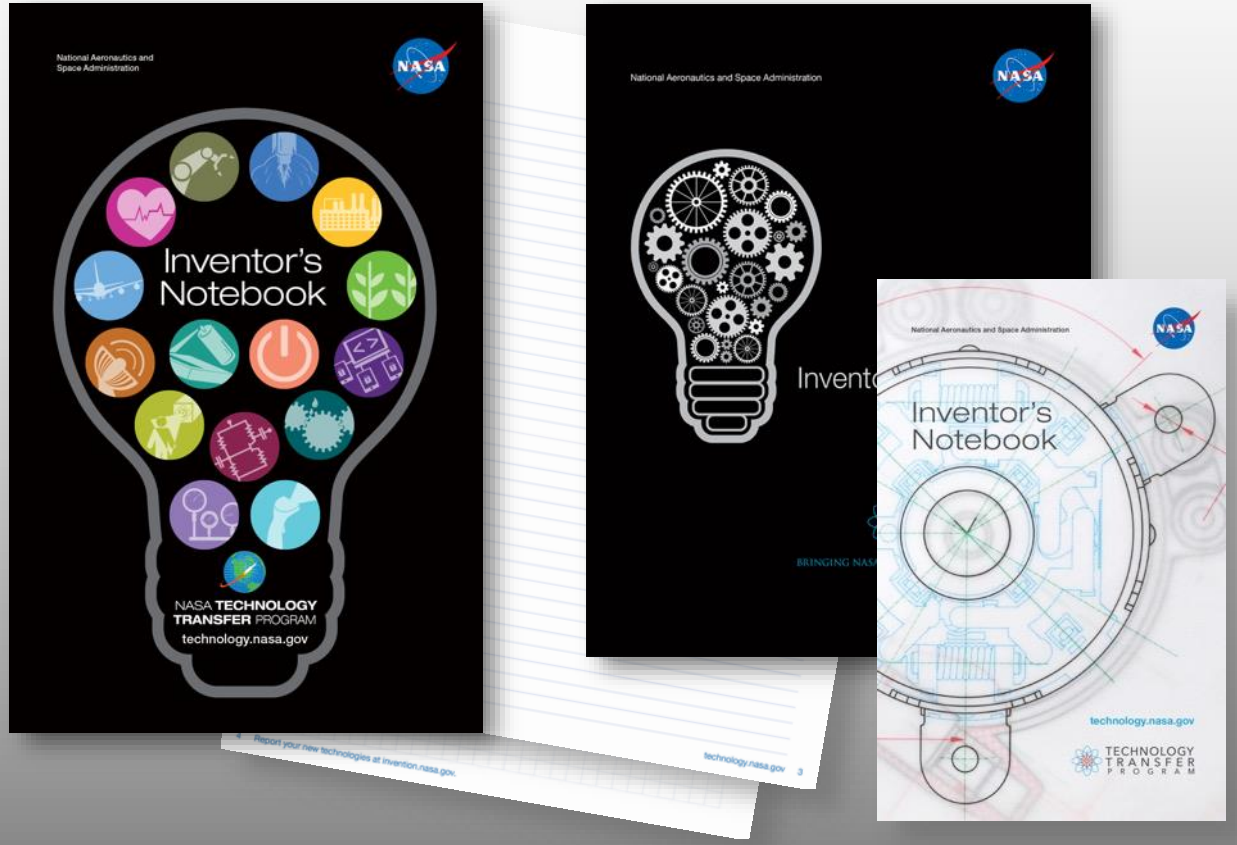
Inventor's Notebooks increase awareness of technology reporting requirements



In FY 2017, the Technology Transfer Offices distributed new Tech Transfer Challenge Coins to civil servant inventors (and WYE inventors on joint inventions) for submitting NTRs

Inventors Hall of Fame

- In an effort to honor the agency's most prolific inventors, we are starting work on a new page for the portal
- The Inventors Hall of Fame will feature all NASA civil servant inventors with 20+ patented technologies
- Site will go live June 2018

NASA Patents

NASA 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 Patent Portfolio Distribution

NASA TECHNOLOGY TRANSFER PROGRAM

Total patents available for licensing*

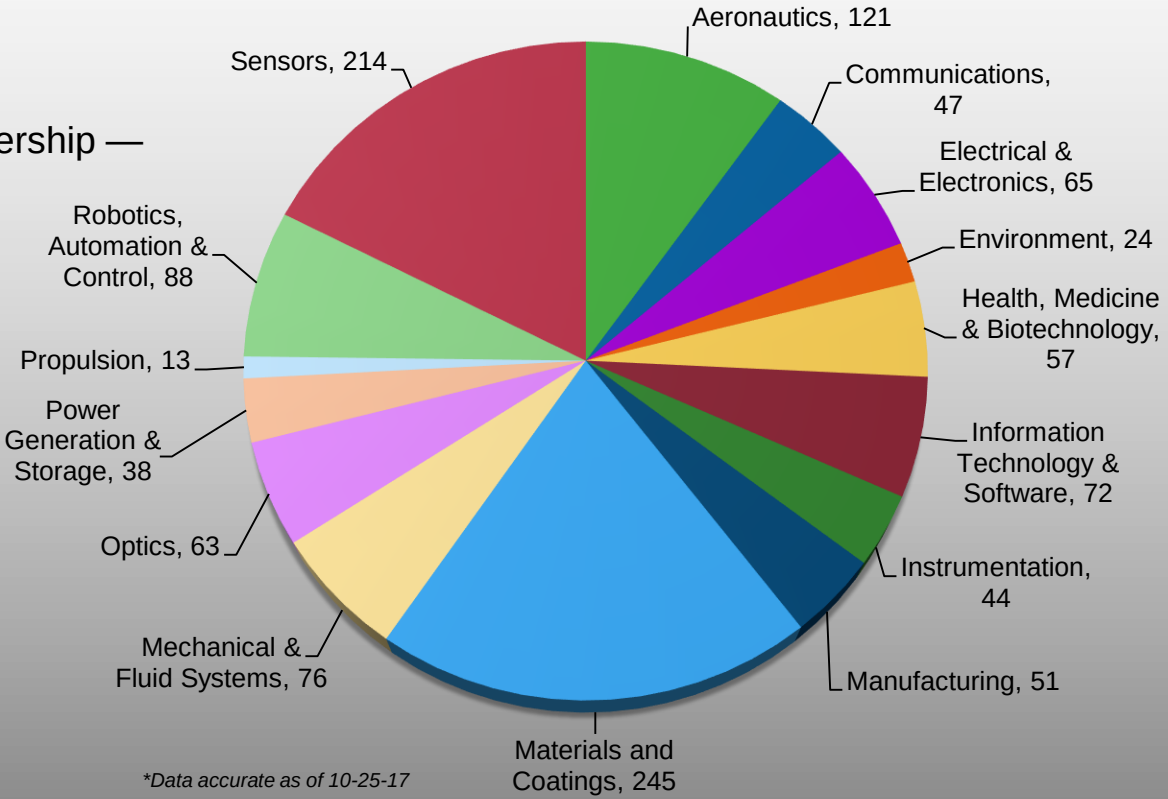
- 871 Issued
- 364 Applications
- 399 Patents already licensed/joint ownership — not included here

(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 10-25-17

Patent Gift to Public Domain

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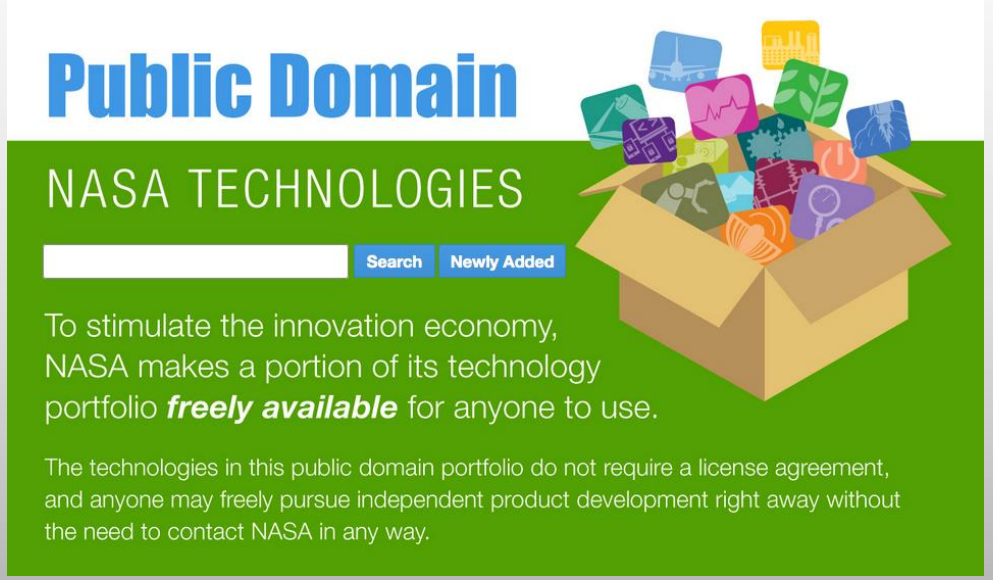
- **Released a carefully-selected portfolio of patents and pending patents to the public domain**
- **A new searchable page of the Portal includes these technologies as well as access to over 6,000 expired NASA patents.**
- **Goals:**
  - Encourage increased use, further development, and increased collaborative 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.
  - Free up Technology Transfer Program resources (money and personnel) to focus on technology with broader commercial potential.



ATLAS

Automated Technology License Application System

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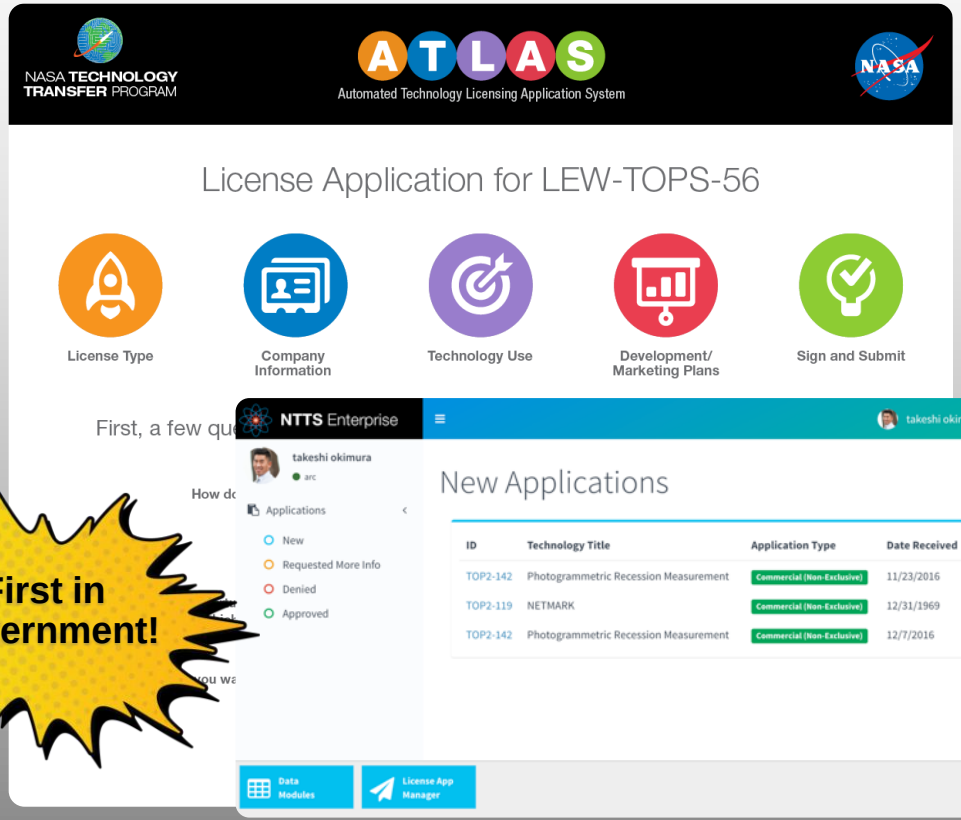
- One stop shop for companies to apply for licenses on NASA technologies, launched June 2017
- 300+ applications started
- Simple and interactive user interface to maximize user experience
- New features include automated reminders to urge applicants to finish and submit applications.
- Addresses the 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



First in Government!

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.

31 new companies have formed since program launched in October 2015.

Geneto

Gaia Elements

BRESSLER
COMMUNICATION
CONSULTANTS

SUN CITY
SMARTTECH

EDRONES

JETOPTERA™

Tellus

AirFlare

PETRA POWER

SpaceBooster LLC

NASAiTech
2017 CYCLE 2
SEMIFINALIST

Dig.y.S L™

PROFESSIONAL TECHNICAL SERVICES

New Exhibit Booth and Schedule

The new T2 booth, complete with backlighting.

MSFC's Tom Knight talks to SEMA 2017 attendees about different licensing initiatives.

MSFC's Paul Hale talks to a FABTECH attendee about licensing from NASA.

FY2018

- **Commercial UAV Expo 2017:** Las Vegas, NV – October 24–26
- **SEMA:** Las Vegas, NM – October 31 – November 3
- **FABTECH:** Chicago, IL – November 6–8
- **Composites and Material Expo (CAMX):** Orland, FL – December 12–14
- **Consumer Electronic Show (CES 2018):** Las Vegas, NM – January 9 – 12
- **SPIE Photonics West 2018:** San Francisco, CA – January 30– February 1
- **Society of Automotive Engineering World Congress (SAE):** Detroit, MI – April 10 – 12
- **Offshore Technology Conference (OTC):** Houston, TX – April 30–May 3
- **Internet of Things World 2018:** San Jose, CA – May 15–17
- **Small Business Expo:** Denver, CO – June 7
- **Sensors Expo:** San Jose, CA – June 27–28
- **SemiCon West 2018:** San Francisco, CA – July 10 – 12
- **International Manufacturing Technology Show (IMTS):** Chicago, IL – September 10–15

NASA Technology Transfer University

NASA TECHNOLOGY TRANSFER PROGRAM

Now in its 3rd year, 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.

T2U NASA TECH TRANSFER UNIVERSITY

- 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 technologies
- NASA teaches thousands of potential entrepreneurs about the availability of taxpayer-funded technologies across the federal government

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.

First in Government!

Software Release System

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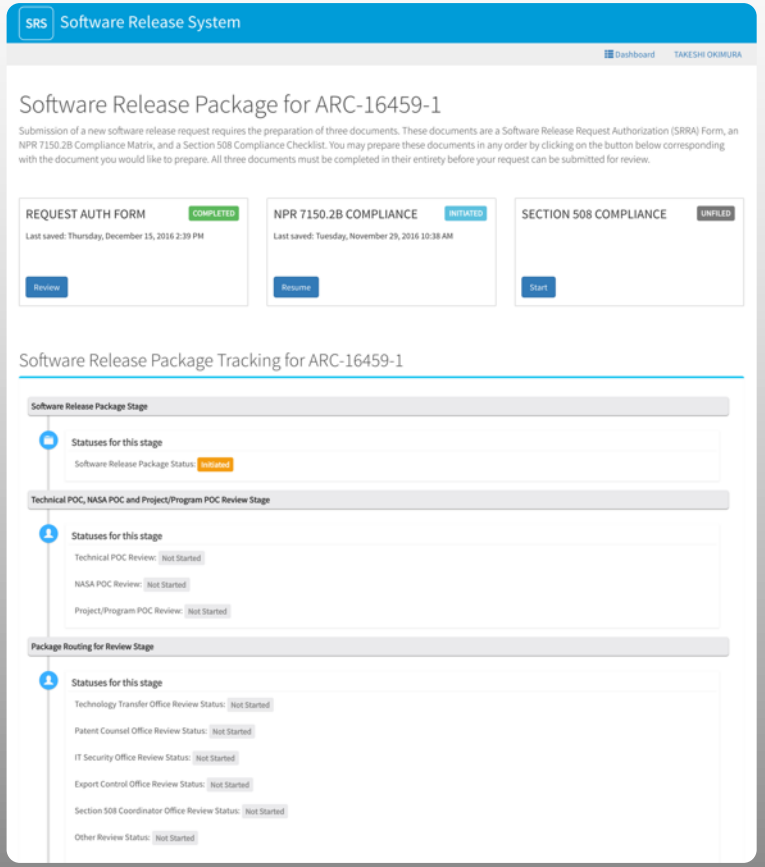
By popular demand…

- 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
- Built-in Software Release workflow controlled by the system assures all field centers are following the same process, resulting in sharing of lessons learned and cross-center support



NASA Remote Sensing Toolkit

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- NASA operates a constellation of Earth observation satellites, collects petabytes of data each year, and creates a variety of tools to access, analyze and utilize that data.
- However, the process to find this information remains daunting for many potential users.
- As part of our software release efforts, the Remote Sensing Toolkit (RST) addresses that problem by providing a simple system that quickly identifies relevant data sets, tools and other resources based on user input.
- RST will be released to the public in June following a public announcement campaign that includes a press release, social media efforts, and an email newsletter.

First in Government!

NASA Spinoff Publication

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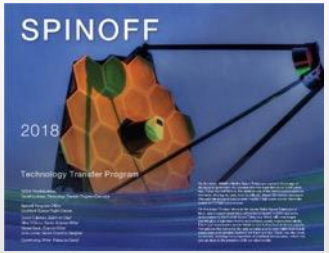


Spinoff 2018 launched January, 2018

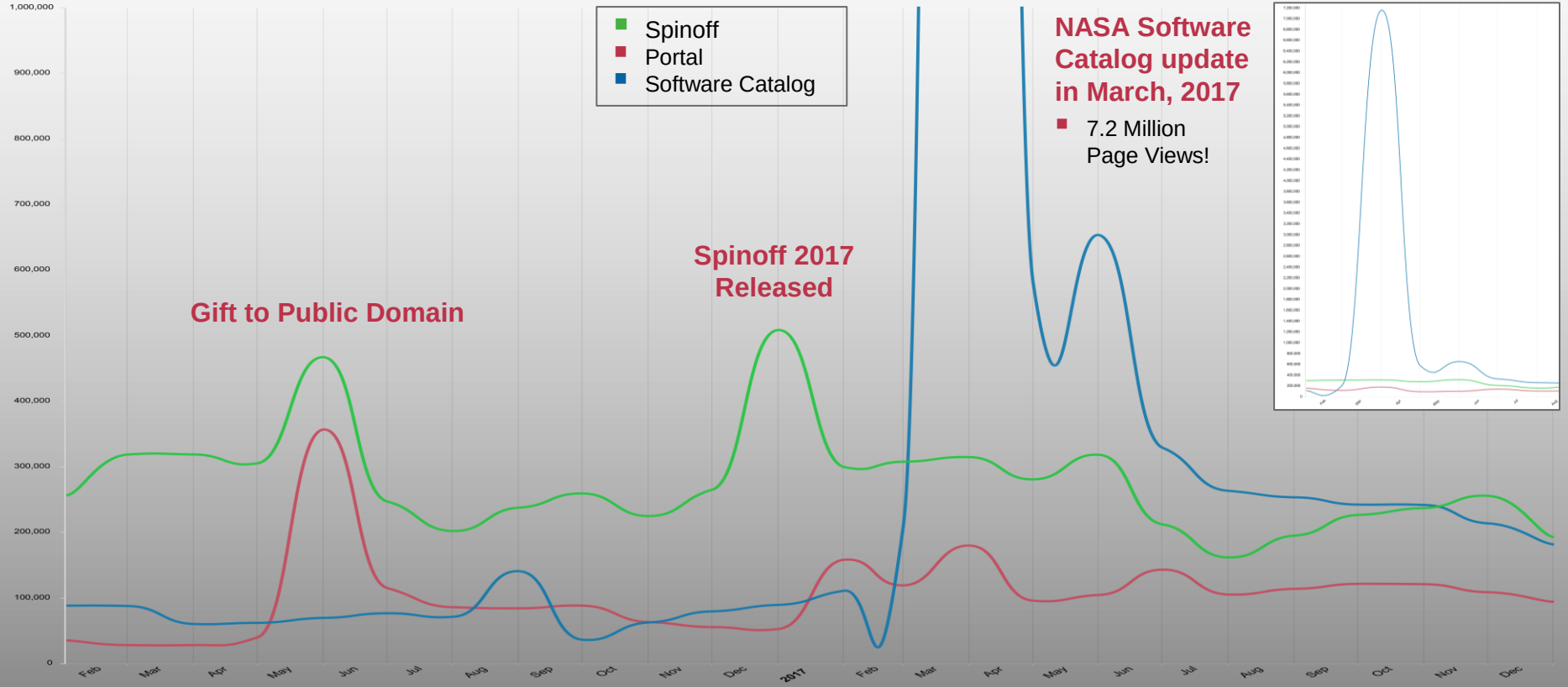
- Features 49 companies in 21 states with tech from 10 NASA field centers
- Life-saving devices, powerful design software, consumer goods, and more

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

Companies profiled in Spinoff 2018

Portal, Software and Spinoff Page Views

January 2016 through December 2017



Tech Transfer's IT Infrastructure

Powered by NTTS

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Innovator Apps

- Electronic New Technology Reporting
- Innovator Dashboard

Licensing Apps

- TOPS Publisher
- Digital Patent Portfolio/iPad App
- CRM
- Patent Portfolio Automated Technology License Application System (ATLAS)

Software Release Apps

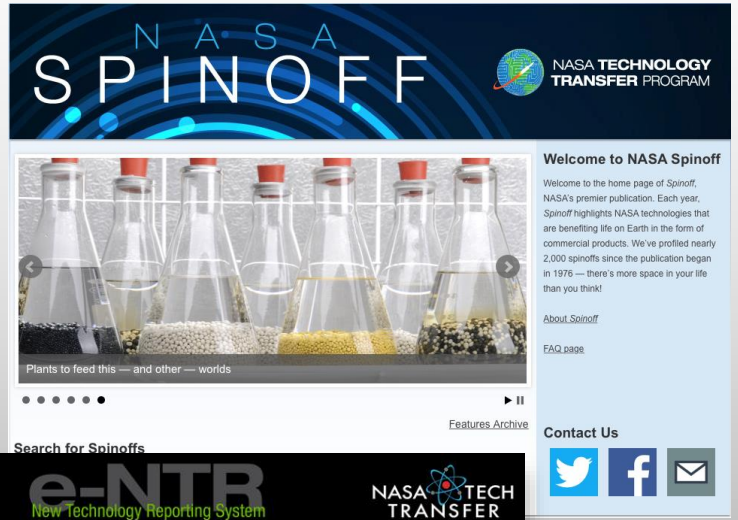
- Software Release System
- SUA Generator
- Software Repository

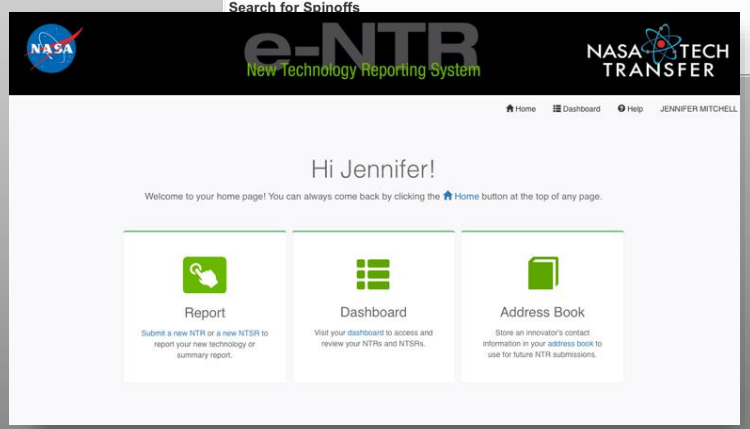
Reporting Apps

- T2 Program Metrics
- T2 Analytics Dashboard

Websites

- T2 Portal
- Software Catalog
- Spinoff
- Electronic New Technology Reporting
- Inventions and Contributions Board
- 10 matching field center websites





FY2018 T2 Annual Program Goals

NASA TECHNOLOGY TRANSFER PROGRAM

New Technology Reporting

1. Assess Options for Optimizing Contract Closeout by Centralizing NTR Function – Harvey Schabes
2. Promote Technology Disclosure and the New, Simplified e-NTR System – Terry Taylor
3. Automate IP Notices to Inventors and Correct Under-Reporting of Invention Disclosures by Prime Contractors – Terry Taylor / Charlene Gilbert

Marketing

4. Launch Targeted Silicon Valley Marketing Campaign – Tony Strawa

Increase Patent Licensing

5. ~~Explore implementation of a national pilot program based on LaRC's successful "Fast Track to Market" competition for agency inventors – Kathy Dezern~~ **POSTPONED**

Software Release

6. Improve Access Controls for Software Release – Dan Lockney
7. Develop methods for providing NTTS services to other Federal Agencies using the Software as a Service (SaaS) model – Tony Strawa

Program Infrastructure

8. Establish Criteria for Determining Levels of Commercialization Potential – Kim Graupner
9. Design, develop and deploy an internal-facing database of technologies, accessible to civil servants as an engineering solutions toolkit – Danny Garcia

T2U

10. Northern New Mexico Innovation Ecosystem Pilot (NASA Tech Transfer Institute) – Charlene Gilbert

Legend | On Track | Concerns | Need Help

2018 Annual Program Goal Highlights

NASA TECHNOLOGY TRANSFER PROGRAM

- **2 – Promote Technology Disclosure and the New, Simplified e-NTR system: Complete**
  - T2 recently redesigned the e-NTR system to make reporting simpler and less difficult to complete for inventors.
  - This APG focused on implementing a coordinated, internal push to promote the new products by creating an email newsletter and video that was sent to all NASA email accounts.
- **7 – Develop Methods for Providing NTTS Services to Other Federal Agencies:**
  - Many federal technology transfer organizations have expressed interest in adopting NTTS.
  - This APG focuses on developing and implement a solution where ARC provides NTTS as Software as a Service and ultimately NTTS is hosted, powered and maintained by NASA to provide a service via reimbursable agreements to other agencies.
  - NTTS was recently released to the Environmental Protection Agency.
- **8 – Establish Standard Criteria for Determining the Commercialization Potential of NTRs and Assessing the Current Patent Portfolio:**
  - This APG focuses on establishing criteria for determining the commercialization potential of NTRs and the current patent portfolio.
  - We need to develop requirements for NTTS to include guidance on how to rate technology using these criteria.

FY2017 T2 Annual Program Goals

NASA TECHNOLOGY TRANSFER PROGRAM

New Technology Reporting

- 1a – Automate IP Notices to Contractors – JSC / Charlene Gilbert
- ~~1b – Modernize e-NTR Interface – KSC / Dave Makufka~~ COMPLETE
- 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~~ COMPLETE
- ~~2c – Design and Implement Promotion Campaign for 2017/18 Software Catalog and Repository – MSFC / Danny Garcia, Barb Fawcett~~ COMPLETE
- ~~2d – Develop a Method for New and Continued Engagement with Tech Transfer Portal Users – LaRC / Kathy Dezern / Jennifer Viudez~~ COMPLETE
- 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 – MSFC / Sammy Nabors~~ COMPLETE

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

Legend: On Track | Concerns | Need Help