

THE INNOVATION CATALYST

STRATEGIC PARTNERSHIPS OFFICE
NEWSLETTER
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How Goddard Licenses Technologies to the Public

License agreements are the beating heart of technology transfer – without these important legal documents, government technologies might never make it to the commercial realm. Yes, they're filled with dense legal jargon, but they spell out the terms and conditions by which an organization outside of NASA can manufacture and sell NASA technologies.

Technology managers with the Strategic Partnerships Office negotiate with licensees to determine fees, royalty payments, and other details. Although inventors do not participate in license negotiations due to the conflict of interest, it's helpful to know the three main types of license agreements.

COMMERCIAL LICENSE

If a company is ready to produce and sell products using NASA technologies, a commercial license is the right choice. NASA can license technologies to domestic and international organizations, although NASA has a mandated preference to work with U.S. companies. Commercial licenses come in three flavors: exclusive, meaning that the licensee holds exclusive rights to that particular technology; partially exclusive, which puts limits on the licensee's exclusivity; and non-exclusive, in which NASA can license the same technology to multiple companies. Technology managers negotiate the terms of commercial licenses on a case-by-case basis, including royalty fees and restrictions to particular fields of use or geographic areas.

EVALUATION LICENSE

This type of license is appropriate for companies that would like to "test drive" a technology before they sign a commercial license agreement. Companies in an exploratory phase of development might want to utilize this more cost-effective option to make sure their chosen NASA technology fits well into their business development plan.

Although companies typically pay a \$2,500 licensing fee for a 12-month, non-exclusive license, they aren't allowed to commercialize the technology until a commercial license is in place.

STARTUP NASA LICENSE

Smaller businesses with limited funds are encouraged to look at the Startup NASA Program, created specifically to help new companies get off the ground. Only available to U.S. companies, a Startup NASA license is non-exclusive and doesn't cost anything upfront, other than a development and marketing plan with commercialization milestones. In other words, the company can begin producing and selling NASA technology immediately without being hindered by licensing fees. This arrangement lasts for the first three years of the agreement; after that, there is an annual minimum licensing fee of \$3,000 once the technology is commercialized. Though there is a running royalty of 4.2 percent.

Goddard's Aeropod, an aerodynamically stabilized instrument platform, has seen success in multiple licensing agreements for educational applications in FY20. Image Credit: NASA Goddard



Featured Goddard Technology: The Core Flight System

There's water on the Moon, and soon, a tiny spacecraft named Lunar IceCube will fly thousands of miles to study it. With NASA's Artemis program planning to land the first woman and next man on the Moon by 2024, Lunar IceCube is a precursor mission, scoping out key resources on the Moon that future astronauts will need.

Though Lunar IceCube is a NASA cube satellite, or CubeSat for short, it's being built at Morehead State University in Kentucky. Initially, the mission team struggled to find flight software that would suit their needs, but a small workshop at the annual Small Satellite Conference in Utah changed Lunar IceCube's course.

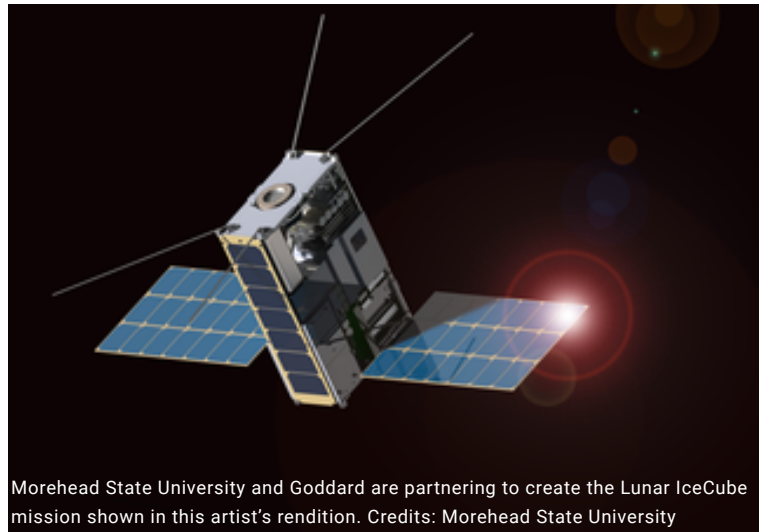
"For interplanetary CubeSat missions, some things just don't scale down to CubeSat size," explains Benjamin Malphrus, a Morehead State University professor who is the lead for Lunar IceCube. "We realized that the flight software solution we had planned to use wasn't going to be adequate, and we needed something with the same level of complexity as a larger mission."

That year at the SmallSat Conference, computer engineers David McComas and Jonathan Wilmot from NASA's Goddard Space Flight Center happened to be hosting a workshop on Goddard's **core Flight System**, a reusable flight software framework created to shorten the amount of time spent on flight software development. Curious to learn more, Malphrus attended the presentation.

"I was completely blown away," Malphrus says. "It was a perfect fit for a small, low-budget mission that really needed sophisticated software but didn't have a big team to develop it."

Kudos!

Congratulations to Goddard innovator Kenneth Harris II, who Forbes named in their "30 under 30" list in the science category! We couldn't be more proud to see Harris recognized for his work on the James Webb Space Telescope as a senior engineer.



Morehead State University and Goddard are partnering to create the Lunar IceCube mission shown in this artist's rendition. Credits: Morehead State University

The core Flight System (cFS) has spent the past decade spreading to other NASA centers and even organizations outside of NASA. Because the cFS is open source, universities and private companies can easily download the code for their own use.

When Lunar IceCube flies to the Moon, it will run using the cFS, joining a long list of spaceflight missions powered by Goddard's collaborative code. As the Artemis program unfolds, the cFS may play an important role in those missions, as well.

For more of this story, see the [Fall 2019 edition of Tech Transfer magazine](#).

Kenneth Harris II works in the clean room at Goddard. Image Credit: NASA Goddard/Chris Gunn



Goddard Tech 12

Each month the Strategic Partnerships Office tells the story of successful spinoffs at NASA's Goddard Space Flight Center and shows how these technological breakthroughs are brought from the labs to our lives. To see the full series, [click here](#).



James Webb Gold Coating Protects the Oscars

Gold has a long history of use as a monetary tool, but the James Webb Space Telescope (JWST) reminds us of gold's value in space. JWST will measure infrared light 400 times fainter than current space-based telescopes. To detect such faint light signatures, detectors need to eliminate all strong heat signals around it. This is why the space telescope will incorporate gold coating on a 32 foot refrigerant tube used to cool the Mid-Infrared Instrument (MIRI). Without obstruction from heat signals, MIRI will help astronomers reveal details of newly formed stars, comets and other objects in the Kuiper Belt.

Epner Technology, Inc., a longtime NASA partner, is responsible for the gold plating which will keep the JWST's Mid-Infrared Instrument operating at 6 Kelvin (-448 Fahrenheit). Epner uses an electroplating process it calls LaserGold. The technique gained in popularity, particularly in the aerospace industry, because the coating won't flake off and is more reflective than traditional gold coating methods.

Because of Epner's advanced LaserGold process, all 18 of the Geostationary Operational Environmental Satellite Programs (GOES) have featured their coatings. It's this same technique that piqued the interest of the Academy Awards committee. Their trophy, nicknamed the "Oscar," faced a problem with the gold flaking off after a number of years. Epner Technology confidently took the challenge of plating the trophies and backed each one with a lifetime guarantee.

In addition to this spinoff success story, Goddard is leading the management of the JWST observatory project and providing the Integrated Science Instrument Module.

Above Image: Technicians and scientists check out one of the Webb telescope's first two flight mirrors in the clean room at NASA's Goddard Space Flight Center in Greenbelt, Md. Credit: NASA/Chris Gunn

Recent SPO Activities

BUILDING 1 CAFETERIA MEET AND GREET

On Jan. 22, SPO brought a table to the Building 1 cafeteria and spoke to members of the Goddard community about technology transfer and submitting New Technology Reports (NTRs). If you missed us, don't worry! We'll be back on Feb. 26. See the "Upcoming Events" section for more information.

SED POSTER PARTY

On Jan. 23, SPO participated in Goddard's annual Sciences and Exploration Directorate Poster Party, where technology managers connected with members of Goddard's science community and learned more about ongoing scientific research and missions. SPO has seen a surge in NTR submissions from Code 600 in recent years. Did you want to talk to SPO about your project, but we missed you? Please reach out to techtransfer@gssc.nasa.gov or give us a call at 301-286-5810.



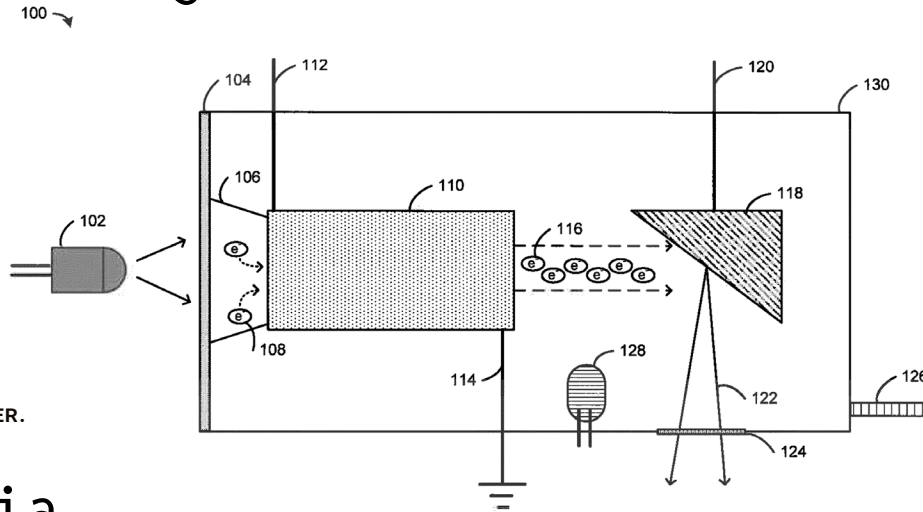
SPO staff members at the SED Poster Party work to connect with Goddard's attending innovators.

Guess The Patent Drawing!

HERE ARE YOUR CLUES:

- 1 Patented in 2015, this Goddard invention played a role in the NICER mission.
- 2 This invention is being studied for applications in the medical field.
- 3 It won NASA's 2019 Government Invention of the Year award.

CAN YOU GUESS THE INVENTION? [CLICK HERE](#) FOR THE ANSWER.



Tech Transfer Trivia

- 1 How many NTRs do you need to submit to begin participating in the Master Innovator Program?
 - A. 1 B. 2 C. 3 D. 4
- 2 Which NASA center invented the CMOS image sensor, a version of which can be found in cell phone cameras?
 - A. Goddard B. Langley C. JPL D. Marshall
- 3 Which Goddard code submitted the most NTRs in FY2018?
 - A. Code 550 B. Code 580 C. Code 450 D. Code 560

[Link To Answers](#)

Upcoming Events

CAFETERIA MEET AND GREET

Feb. 26, 2020

Building 1 Cafeteria

11 am to 1 pm

Spend your lunch break with SPO! On Feb. 26, we'll be in the Building 1 cafeteria handing out information on NASA's technology transfer efforts and how you can participate in the process. You can ask questions about NTRs or software release, learn more about Goddard's Technology Transfer Office, and get involved with Goddard's Master Innovator Program. Come by and see us!

NEW TECHNOLOGY AWARDS PROGRAM

Feb. 27, 2020

Each year, SPO honors the hard work and innovation of Goddard's inventor community by hosting the New Technology Awards Program (NTA), a celebration and recognition of technology transfer and all efforts related to it. The NTA begins with a social hour, where Goddard's innovators from codes all across the Center can meet each other and catch up on each other's work.

SPO and Goddard's Office of Patent Counsel (OPC) present awards throughout the program. First is the James Kerley Award, named after one of Goddard's most prolific champions of technology transfer. SPO gives this award to Goddard innovators who go above and beyond to promote innovation and the transfer of NASA technologies to the public. Next, SPO presents a "traveling trophy" to the code that has submitted the most NTRs in the past year. This trophy acknowledges the importance of NTR submission to the technology transfer process and encourages friendly competition among the divisions. Finally, OPC and SPO present plaques to each inventor whose technology received a patent in the past year.

SPO will send invitations in the coming weeks – by attending, you'll help us celebrate Goddard's innovative achievements from the past year and inspire innovations in the years to come.

COLLABLAB

A Strategic Partnerships Office Speaker Series

Building 3 Auditorium

March 12, 2020

1:30 pm to 2:30 pm

What do NASA and the National Museum of Natural History have in common? Find out from Goddard engineer Nithin Abraham and objects conservator Catharine Hawks of the Smithsonian Institution as they share a story of collaboration between the two institutions. Under a Space Act Agreement, Abraham has helped test a NASA coating technology for use in the field of museum conservation.

CollabLab is a new speaker series that will focus on exciting collaborations and technology transfer success stories at Goddard. Please stay tuned for future events in this series!