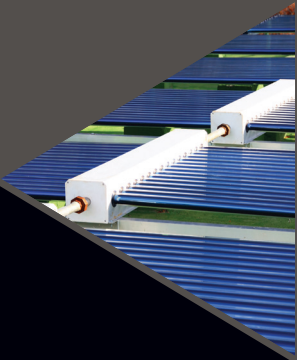


National Aeronautics and Space Administration



2018

BRINGING NASA TECHNOLOGY
DOWN TO EARTH

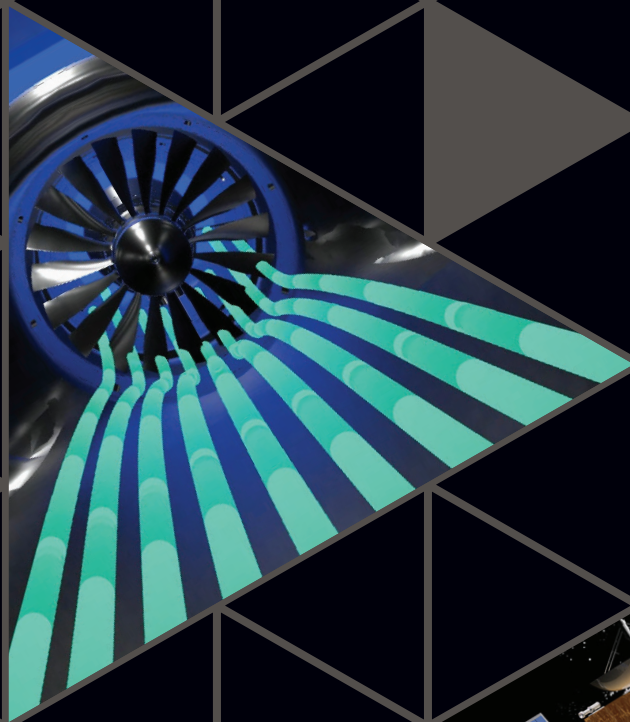


Glenn Research Center



OpenMDAO

An open-source, high-performance computing platform for systems analysis and multidisciplinary optimization



Inventors: Justin Gray, Bret Naylor, Kenneth Moore, Keith Marsteller, and Scott Townsend LEW-18550-1



- CubeSat design and mission planning
- Wind turbine design and wind farm layout
- Hybrid electric propulsion conceptual analysis
- Boundary layer ingestion modeling
- Optimization of aircraft trajectories



invention.nasa.gov

JANUARY

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

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New Year's Day

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File your NTR

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Martin Luther King Day

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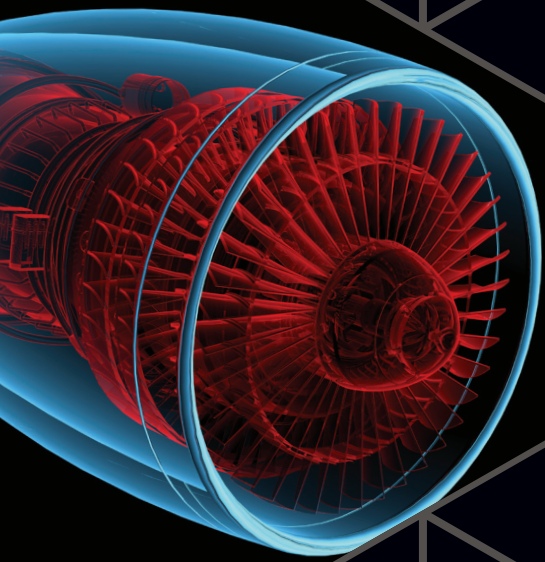
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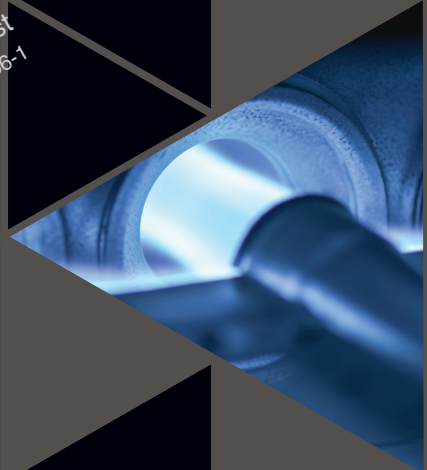
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01/31/1961 – Mercury-Redstone 2 was launched at 11:54 a.m. EST, Cape Canaveral, FL with chimpanzee Ham aboard.

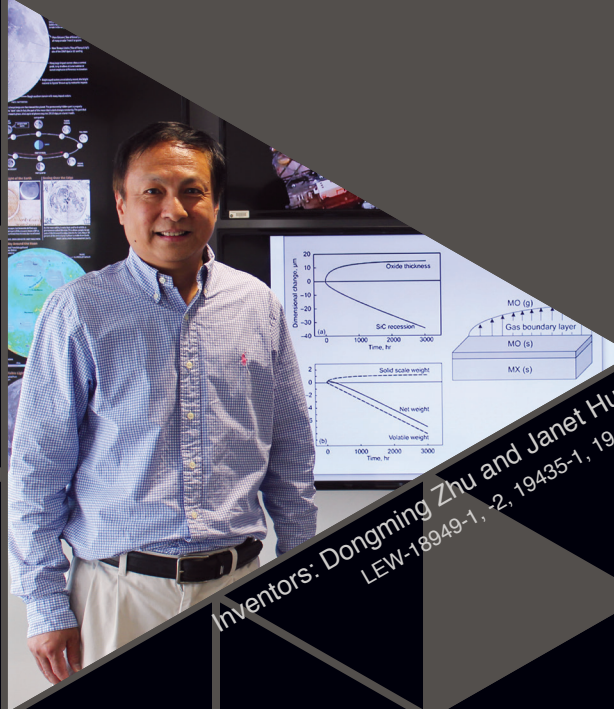


Thermal and Environmental Barrier Coating System

Stable, tough, and durable in the harshest of environments

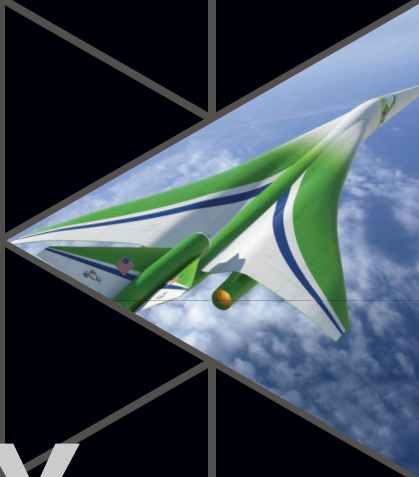


- Aerospace
- Energy
- Batteries and fuel cells
- Nuclear fission and fusion reactors
- Heat exchangers
- Furnace components



Inventors: Dongming Zhu and Janet Hurst
LEW-18949-1, -2, 19435-1, 19456-1

invention.nasa.gov



FEBRUARY

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

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File your NTR

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Presidents' Day

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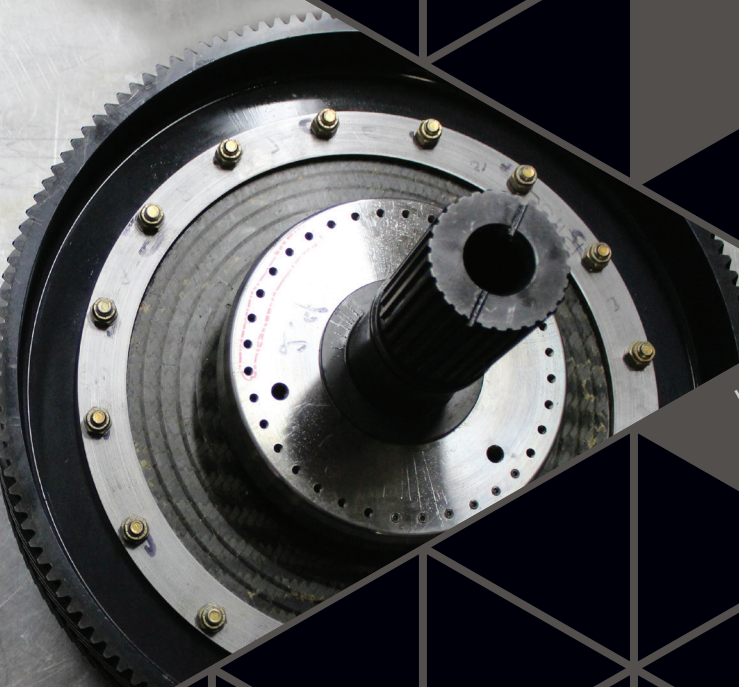
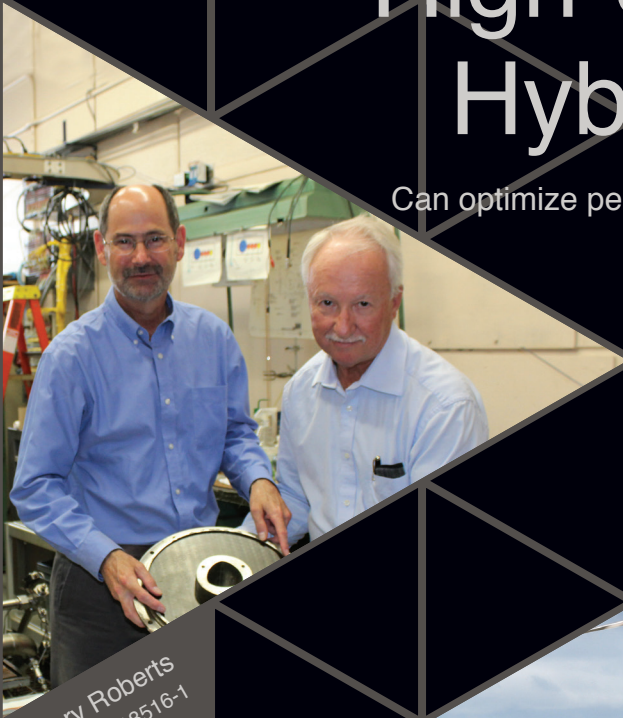
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02/20/1962 — John Glenn became the first American to circle the Earth, making three orbits in his Friendship 7 Mercury spacecraft.

Lightweight, High-Strength Hybrid Gear

Can optimize performance of gear systems



Inventors: Robert Handschuh and Gary Roberts
LEW-18516-1

- Aerospace
- Military
- Automotive
- Construction equipment
- Wind turbines

invention.nasa.gov

MARCH

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

03/17/2011 – NASA's MESSENGER spacecraft successfully achieved orbit around Mercury at approximately 9 p.m. EDT, the first time a spacecraft accomplished this engineering and scientific milestone at this planet.

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File your NTR

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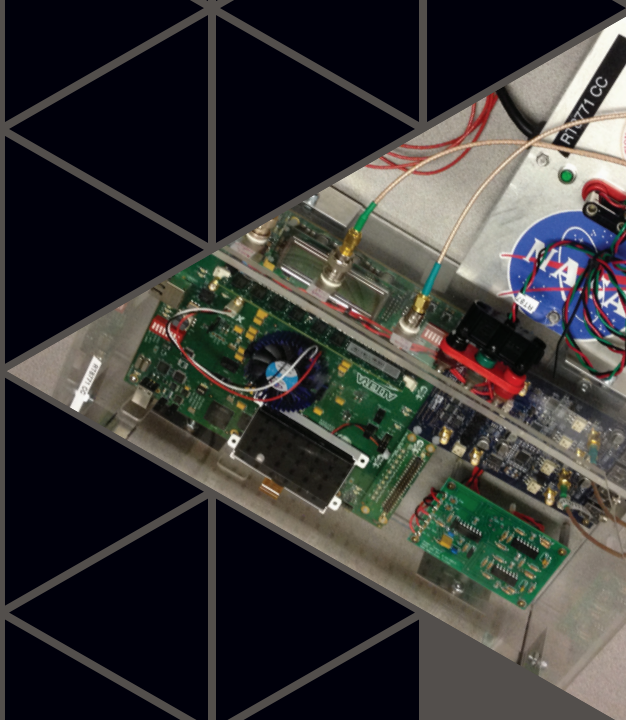
25 26 27 28 29 30 31

Self-Diagnostic Accelerometer Field Programmable Gate Array

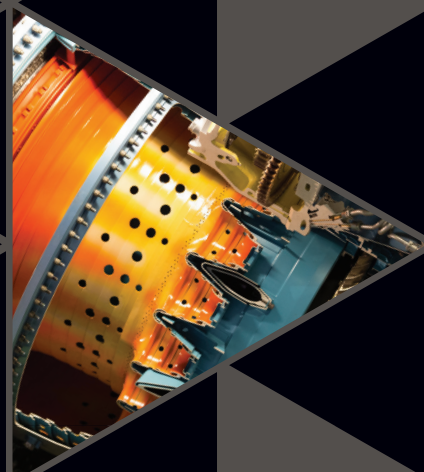
A real-time sensor health diagnostic system



Inventors: Roger Tokars and John Lekki
LEW-19187-1



- Aircraft systems
- Automotive diagnostics
- Industrial machinery
- Marine systems



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APRIL

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

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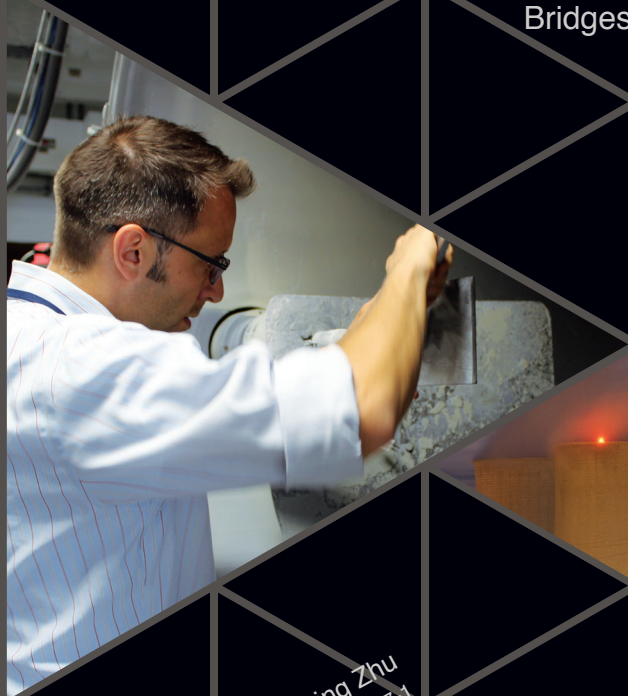
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04/24/1990 – Launch of the Hubble Space Telescope from the Space Shuttle.

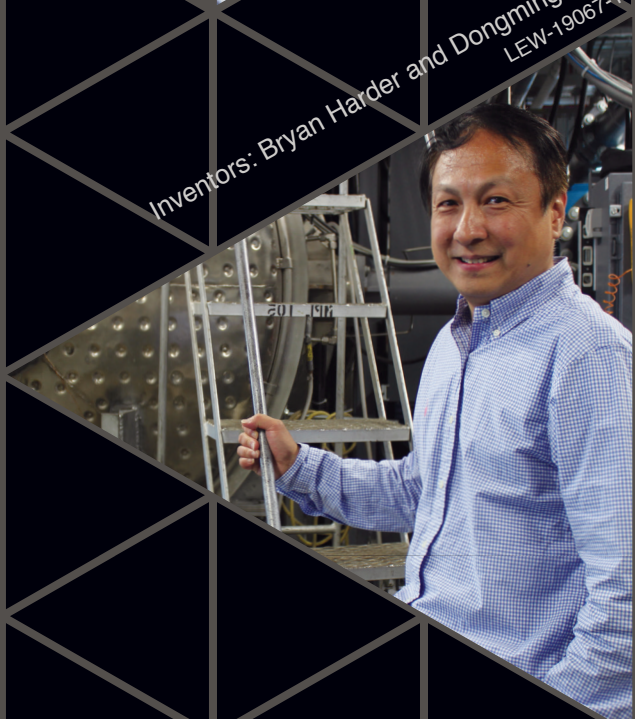
A Method to Apply Thermal and Environmental Barrier Coatings

Bridges the gap between plasma spray and vapor phase methods



Aerospace
Energy
Batteries and fuel cells
Nuclear fission and fusion reactors
Heat exchangers
Furnace components

Inventors: Bryan Harder and Dongming Zhu
LEW-19067-1



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MAY

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

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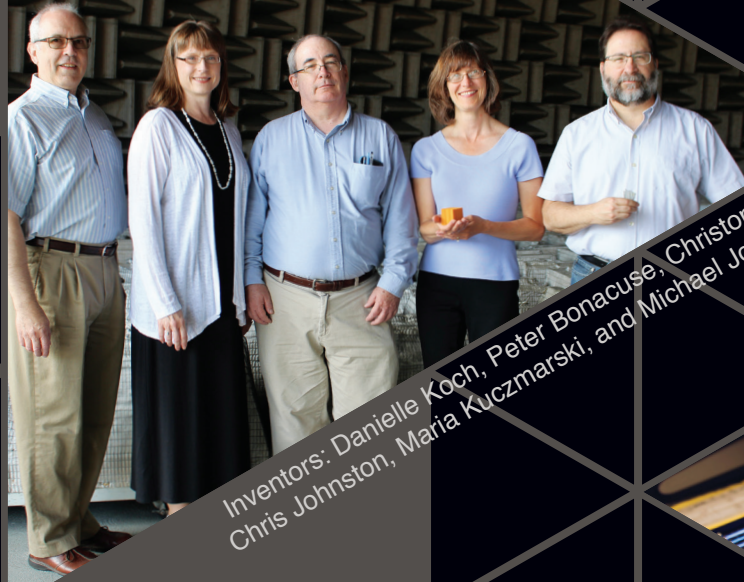
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Memorial Day

05/05/1961 – The first piloted Mercury spacecraft (No. 7), Freedom 7 carrying astronaut Alan B. Shepard, Jr., was launched from Cape Canaveral by the Mercury Redstone 3 launch vehicle. It was the first American space flight involving human beings.

A Method for Reducing Broadband Noise

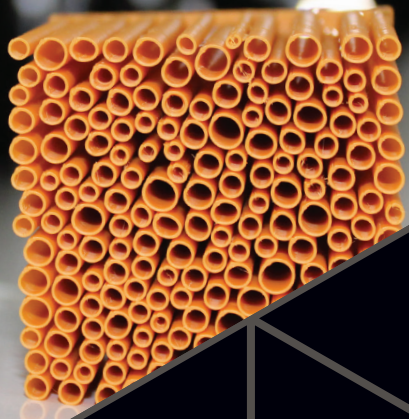
Thin and lightweight broadband acoustic absorbers inspired by nature



Inventors: Danielle Koch, Peter Bonacuse, Christopher Miller, Chris Johnston, Maria Kuczumarski, and Michael Jones (LaRC) LEW-19234-1



- Aircraft cabin
- Aircraft engine
- Industrial environments
- Broadcasting
- Residential and commercial building construction
- Commercial and private vehicles
- Gun ranges
- Highway barriers



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JUNE

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

06/18/1983 – Space Transportation System mission 7 (STS-7) Challenger launches, carrying the first American woman in space, Sally Ride.

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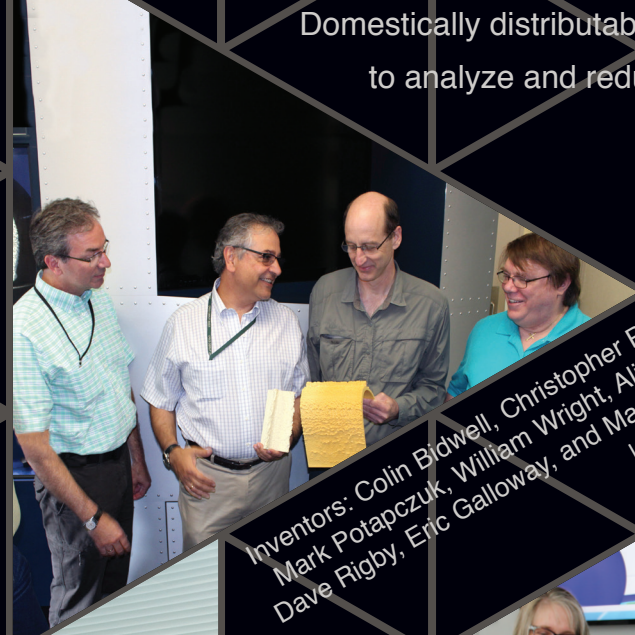
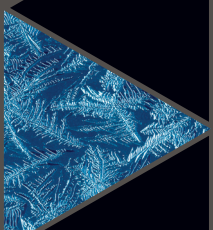
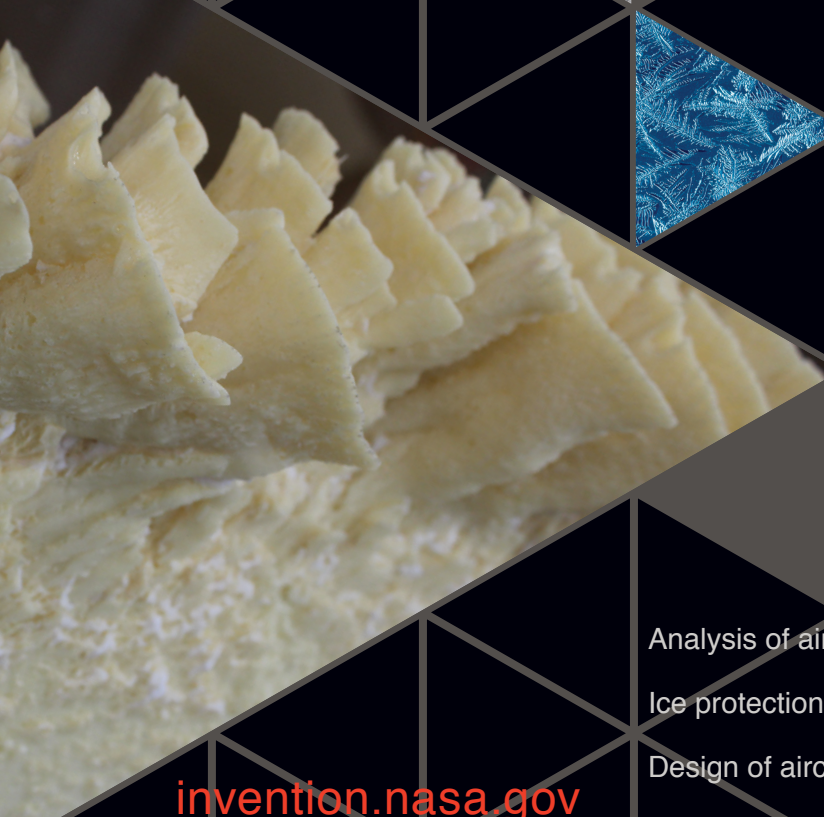
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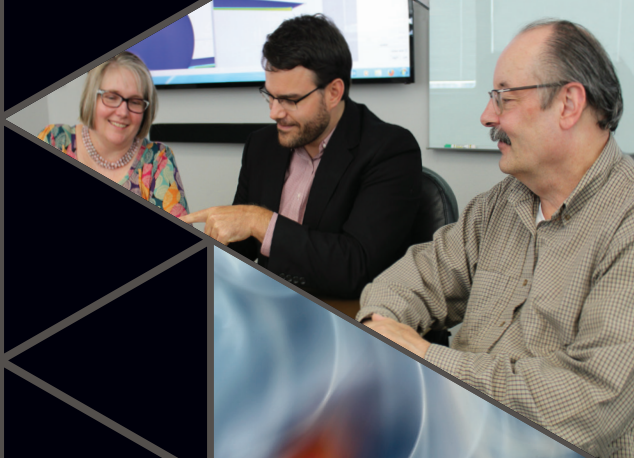
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LEWICE3D Droplet Impingement and Ice Accretion Software

Domestically distributable, royalty-free software to analyze and reduce icing risk for aircraft



Inventors: Colin Bidwell, Christopher Porter, Mark Potapczuk, William Wright, Ali Ameri, Dave Rigby, Eric Galloway, and Mary Wadel LEW-19433-1



Analysis of aircraft susceptibility to ice accretion
Ice protection system design
Design of aircraft, rotorcraft, UAVs, jet engines, nacelles, probes, and detectors
Aircraft certification

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JULY

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

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Independence Day

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File your NTR

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07/04/1997 – Mars Pathfinder landed on Mars, after its launch in December 1996. A 23-pound robotic rover named Sojourner departed the main lander and began to record weather, atmospheric, and geological data.

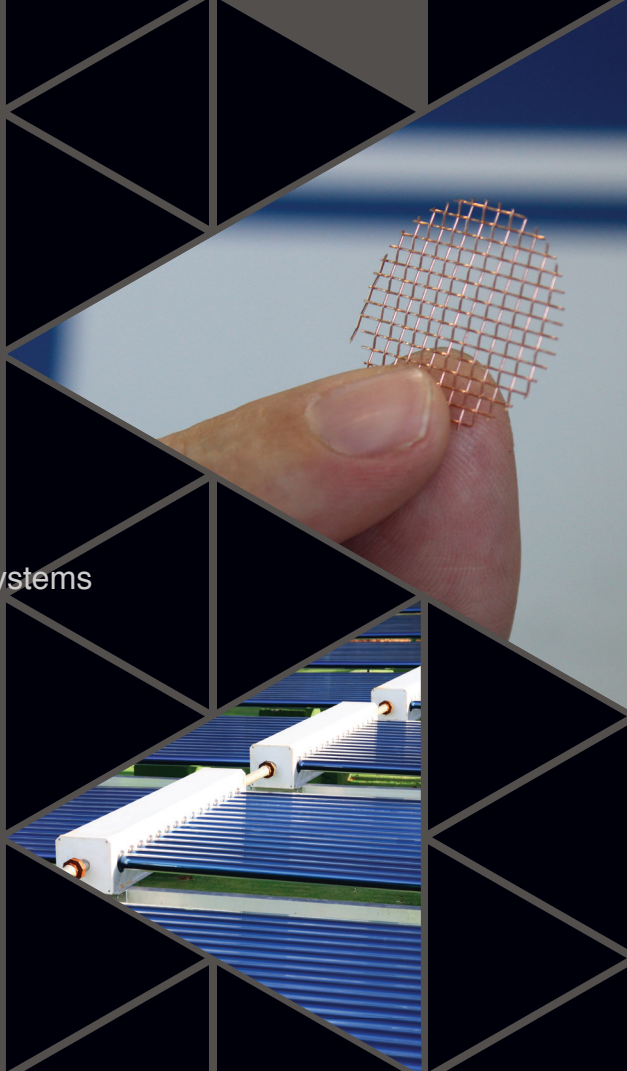


Inventor: Rodger Dyson
LEW-19387-1

Double-acting Extremely Light Thermo-Acoustic (DELTA) Convertor

Lightweight, high-frequency, high-efficiency convertor provides increased specific power

- Next-generation aircraft
- Unmanned aircraft vehicles
- Portable power packs
- Auxiliary power units
- Autonomous underwater vehicles
- Micro combined heat and power systems
- Co-generation
- Concentrated solar thermal power
- Mobility on demand



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AUGUST

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

08/30/1984 – Space Shuttle Discovery launched, beginning the mission STS-41D. In addition to deploying three satellites, it extended a 102-foot-tall, 13-foot-wide solar wing called the Office of Aeronautics and Space Technology-1 from its payload bay. The wing was used to demonstrate large lightweight solar arrays for future use on structures like the International Space Station.

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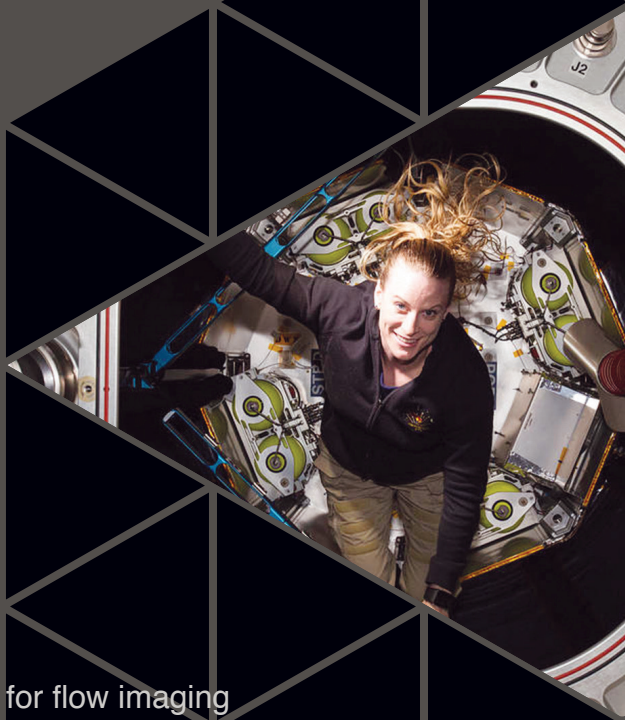
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Multi-Stage Filtration System

Particle impactor and scroll filter operate in high-temperature, extreme environments



Inventors: Juan Agui and Rajagopal Vijayakumar
LEW-18837-1, -2

- HEPA filters
- Air and gas systems
- Microgravity environments
- Fluid mechanics
- Commercial aircraft
- Submarines
- Remote instruments
- Fluid and gas dynamic research for flow imaging

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SEPTEMBER

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

09/01/1970 – On September 1, Pioneer 11 passed rings of Saturn, 13,000 miles above cloud tops. It was the first spacecraft to fly past Saturn.

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Labor Day

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File your NTR

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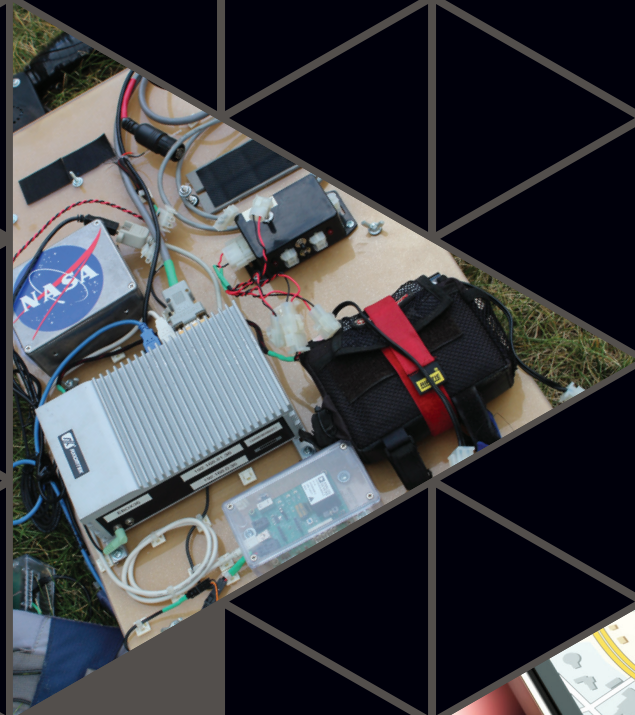
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Sampling and Control Circuit Board

For an inertial measurement unit



Inventors: David Chelmins, Obed Sands, and Richard Powis
LEW-18809-1

invention.nasa.gov



Navigation
Robotics

Process control and industrial automation
Instrumentation and measurement

OCTOBER

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

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Columbus Day

File your NTR

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10/18/2013 – The Lunar Laser Communications Demonstrator aboard the Lunar Atmosphere and Dust Environment Explorer successfully sends and receives the first communications via laser at lunar distance.

High-Strength Superelastic Compounds

Shock-resistant material eliminates corrosion and polishes to a smooth surface finish



Aerospace bearings, gears, drives, actuators, and other mechanical systems

Rotorcraft engine bearings, rotor mechanisms, and drive systems

Flight and water vehicles

Industrial knives and cutters

Electric machines

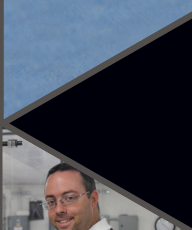
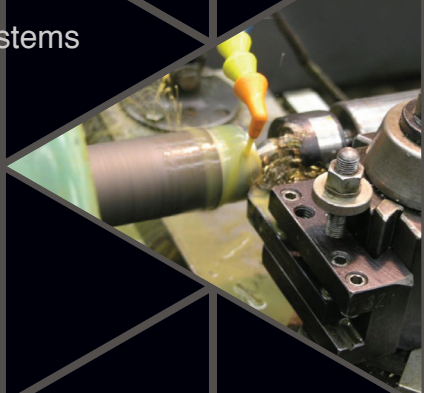
High-performance fasteners

Valve components

invention.nasa.gov



Inventors: Christopher DellaCorte, Malcolm Stanford, Ronald Noebe, Santo Padula, Glen Bigelow, and Fransua Thomas
LEW-18604-1, 18785-1, 19029-1



NOVEMBER

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

11/16/2004 – The X-43A hypersonic test vehicle breaks a record as its scramjet engine propels it at nearly 10 times the speed of sound.

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Veterans' Day

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Veterans' Day
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File your NTR

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Thanksgiving Day

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Secure Optical Quantum Communications

Novel production and use of entangled-photon pairs enhances quantum communications capability

Inventors: Quang-Viet Nguyen,
John Lekki, and Jun Kojima
LEW-17458-2, 17814-1, 17915-1

- Fiber optic communication systems
- Free-space laser communication systems
- Satellite communications
- Defense technologies
- Airborne communications
- Surveillance systems
- Communications between micro-robots
- Unmanned aerial vehicle surveillance communications
- Secure line-of-sight optical communication links

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DECEMBER

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

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File your NTR

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Christmas Day

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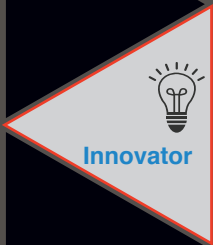
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12/23/1968 – The Apollo 8 crew uses a portable TV camera to take the first images of the full sphere of Earth as seen from space by humans.

What is a new Technology?

A new technology is any invention, discovery, improvement, or innovation—whether or not patentable—which includes, but is not limited to, new processes, machines, manufactures, and compositions of matter, and improvements to, or new applications of, existing processes, machines, manufactures, and compositions of matter. New technologies also include new computer programs, and improvements to, or new applications of, existing computer programs.

If in your work you solve some kind of a technical problem or find a new way of doing things that is somehow better, that is reportable as a New Technology Report (NTR). Any improvement—no matter how big or small—should be reported in an NTR.



Innovator

NTR



TTO/Legal
Evaluation



Secure
Patent



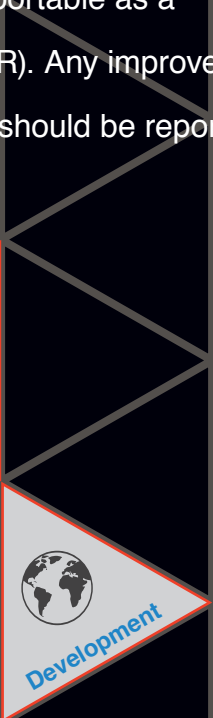
Target
Industry



License
Agreement



Awards
& Money



Development

invention.nasa.gov

Bring your New Technology Down to Earth

It is our responsibility at NASA to help drive innovation. One of the most successful ways to do this is by transferring our technology into the marketplace.

We are here to help you get your technology recognized and used by millions. The first step is submitting your NTR!

How to submit your NTR

Submitting your NTR is easy. Just go to invention.nasa.gov and get started. The process takes under one hour. If you don't have time or need help, please email us at grc-techtransfer@mail.nasa.gov. Our Technology Managers oversee our portfolio of technologies and can assist you.

Benefits of filing NTRs

Reported technologies can potentially lead to patents, awards, financial compensation, connections to further the science and R&D, and a partner in the Technology Transfer Office that will share your vision for moving the technology out beyond NASA.

We Are Here to Help You



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Priscilla Diem
priscilla.s.diem@nasa.gov
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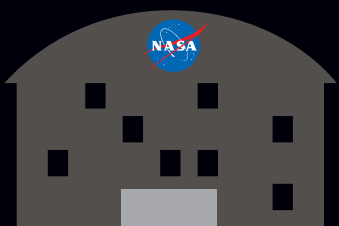
Jason Hanna
jason.m.hanna@nasa.gov
216.433.6731



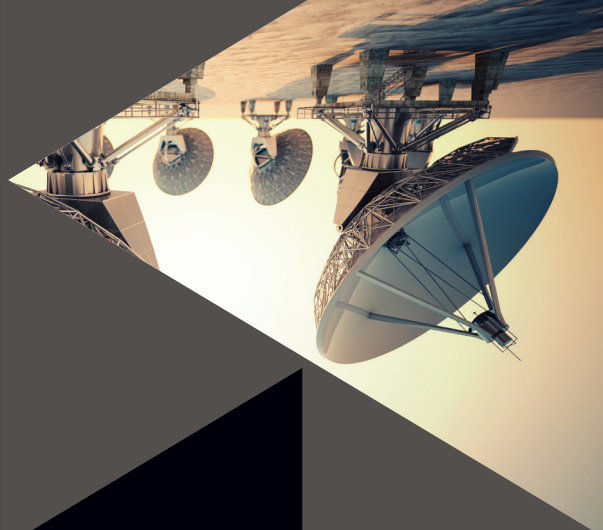
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Amy Hiltabidel
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