National Aeronautics and Space Administration

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goddard tech transfer news

on the cover:

Goddard researcher John W. Keller and his 3-D model of Olympus Mons on Mars, the largest volcano in our solar system.

The software used in making these models has been made available through the Software Release Program.

Read more about how Goddard's Office of Technology Transfer makes this—and other technology transfer successes—happen.

photo credit: Chris Gunn

in this issue:

photo credit: Chris Gunn

Communication Is Key

It is with great pride that I present to you the new design for our quarterly publication: *Goddard Tech Transfer News*. For employees and contractors of Goddard, Wallops, and IV&V, this magazine is dedicated to technology transfer topics. But the look is not the only thing that has changed for *Goddard Tech Transfer News.*

We want the content of our magazine to help you more easily participate in achieving NASA's technology transfer goals. So we'll keep you up to date on policies and practices for reporting your innovations. We'll answer frequently asked questions, augmenting the many training opportunities we are adding to this year's calendar. We'll let you know of upcoming deadlines for technology-based award applications and other recognition opportunities.

We also hope that this magazine will benefit your research and development (R&D) projects. We'll provide information about possible partnership opportunities and funding sources for collaborative R&D. We'll alert you of upcoming conferences relevant to your research.

And we hope to keep you tuned in with your colleagues. We'll share the insights of innovators who are participating in technology transfer efforts. We'll tell you about new technologies and software being developed across Goddard, Wallops, and IV&V. We'll let you know about the partnerships with outside organizations—companies, universities, and other federal labs—in which your fellow researchers are participating.

We hope that you find the new *Goddard Tech Transfer News* interesting and informative. Please take a moment to let us know what you think of this first issue. Your comments and suggestions will help us make sure that *Goddard Tech Transfer News* meets your needs.

Enjoy!

Nona Minnifield Cheeks
Chief
Office of Technology Transfer

Goddard Tech Transfer News

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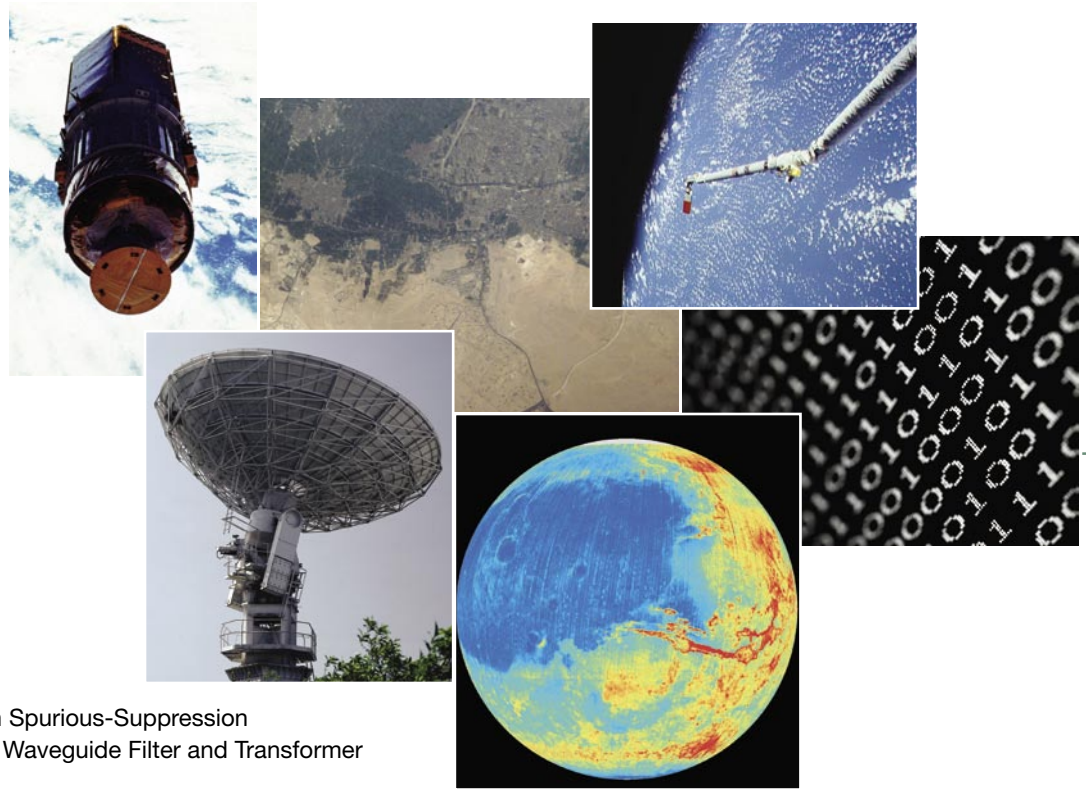
Goddard Tech Transfer News is the quarterly magazine of the Office of Technology Transfer (Code 504) at NASA Goddard Space Flight Center in Greenbelt, Maryland. This magazine seeks to inform and educate civil servant and contractor personnel at Goddard, as well as at Wallops Flight Facility and the Independent Verification and Validation (IV&V) Facility, about actively participating in achieving NASA's technology transfer goals:

- Filing required New Technology Reports on eNTRe (http://entre.nasa.gov)
- Pursuing partnerships to accelerate R&D
- Finding new applications for space-program technology
- Identifying innovative funding sources
- Applying for awards, conference papers/presentations, and more

Please send suggestions or feedback about *Goddard Tech Transfer News* to the editor.

NTR Corner

Editor's note: This column will feature technologies that have been reported to Goddard's Office of Technology Transfer. These technologies are just beginning the technology transfer process. For more information about reporting your technologies, go to http://entre.nasa.gov or contact the OTT (6-5810; techtransfer@gsfc.nasa.gov).



Technology Title: Broadband High Spurious-Suppression Polarization-Preserving Microwave Waveguide Filter and Transformer

Inventors: Felice Maria Vanin (student intern) and Edward J. Wollack (Code 665)

Case No.: GSC-15055-1

What it is: Designed for use with microwave-frequency electromagnetic (EM) signals, this technology filters out noise while maintaining signal fidelity by independently filtering each polarization. The filter blocks EM waves up to 5 times higher than the cut-off frequency for the fundamental mode. This is accomplished by limiting spurious modes in the structure and suppressing repetition of the fundamental mode (i.e., harmonics) in the stop band, thus eliminating noise and potential out-of-band interferences.

The transformer enables the filter to be connected to standard waveguides and provides a region within the circuit to extract the signals so that they can be utilized.

What makes it better: This technology's ability to maintain isolation between the two signal polarizations while effectively rejecting the out-of-band (i.e., undesired) frequencies represents a significant improvement over existing filters in terms of signal purity, bandwidth, and polarization isolation. For high-sensitivity microwave and millimeter receivers, such improvements are key to achieving high-quality data as the EM spectrum becomes ever more crowded.

How it might be used: Designed for use with low-background astronomical observations, this technology also has application outside of NASA wherever dual-polarization microwave signals are desired. The technology could be used in satellite, telecommunications, and data transfer applications as well as microwave radiometry, instrumentation, and remote sensing. It also could be used in millimeter-wave thermal imaging systems for passive detection of contraband, weapons, and so forth.

Q&A

Q: Eureka! I've invented something. Now what do I do?

A: File a New Technology Report (NTR) using the online eNTRe system (http://entre.nasa.gov).

- Reporting new technologies is ***required*** of NASA civil servants under NASA Policy Directive 2091.A and by contractors through their contractual agreements.
- It is important that you file the required NTR forms before publishing or presenting your results publicly. Premature public disclosure can compromise NASA's position in terms of patenting your invention.
- An NTR is required to make your technology eligible for awards.
- If you need assistance in completing the NTR, contact Goddard's Office of Technology Transfer (6-5810; techtransfer@gsfc.nasa.gov).

Campers from the August 2005 "Circle of Life" science camp examine Dr. Keller's rapid prototype tactile models of the Martian landscape.

In a collaborative effort between the National Federation of the Blind and NASA Goddard, the camp is designed to promote an interest in science among school-age children who are blind. Scientists, camp facilitators, and other blind professionals—including Goddard employees—mentor students, giving them positive reinforcement and instilling a spirit of accomplishment throughout the week of activities.

John W. Keller

What is your field of research at Goddard?

Much of my work is concentrated on development of instrumentation for charged particles in space as well as energetic neutral atoms (ENAs). I've been working with a space plasma physics group, which is mostly concerned with solar wind.

What is solar wind?

These are the charged particles from the sun that interact with the magnetospheres of planets. On Earth, solar wind causes the auroral (e.g., Northern) lights. Because solar wind causes disturbances in our magnetosphere, it can interfere with communication satellites and such.

How are solar wind, space plasma, and the like studied?

We measure the plasma through remote observations that look at the atom not in its ionized state but after it has been neutralized through charge exchange with an ambient nonionized atom. Charged particles in space are confined to rotate about magnetic field lines, but when they become ENAs they move in essentially a straight line, as when you spin a stone in a sling and then release it. That's when we can capture them in our instruments, which allows us to image the plasma from a distance.

What instruments do you develop?

The problem with these observations is that it is fairly difficult to detect charged particles, especially in the energy ranges we're concerned with. Ironically, the best way to study the neutral atoms is to reionize them once they are in the instrument's aperture.

One instrument I developed is called the "Turbo Trap," which was designed to improve the ionization process. Traditionally particles were ionized by interacting with a treated surface, but this was very inefficient. With my background, I knew that we could increase the probability of ionization tenfold if we passed the particles through cesium gas. Of course, since space is a vacuum, we had to find a way to keep the gas inside the instrument.

The Turbo Trap is essentially two fans that spin at supersonic speeds that are faster than the cesium atoms but slower than the ENAs in space. So the fan blades confine the cesium gas while allowing the ENAs to enter the trap, go through the gas, and come out as charged particles with a reasonable probability of not hitting a fan blade.

The concept showed promise, but because of the mechanical elements NASA decided not to develop it further. Fortunately, Goddard's Office of Technology Transfer has worked with me to identify some other possible applications for the Turbo Trap.

photo credit: Chris Gunn

"Many times blind students are left out of sciences and math because some educators think, 'Oh, this is too difficult, they couldn't possibly grasp these concepts,'" said the camp's lead instructor, Robin House. "The idea of this particular camp was a little bit of exposure in all the areas of science to get kids going, 'I can do science, I can do it. I can become a scientist if I want to.'"

Goddard has participated in the "Circle of Life" science camp two years in a row. This year's camp will be held July 29 to August 5, 2006. For more information, contact Nina Harris (6-8101; Nina.G.Harris@nasa.gov).

How else could the Turbo Trap be used?

We discussed applying the Turbo Trap concept to discharge lamps for vacuum UV radiation. In fact, the OTT helped put a Space Act Agreement in place so a company called Global Systems Technologies (GST) can test this application. It's a pretty bold project, and it will be exciting if the Turbo Trap works out for GST.

Are there other technologies that you have worked on with OTT?

I was involved in an education outreach project where I wrote a software program that converted MOLA [Mars Orbiter Laser Altimeter] topography data into a form that could be used by a rapid prototyping machine to make three-dimensional solid models of the craters, volcanoes, and other terrain features of Mars. We made a bunch of these models, and they have been used at events such as the National Federation for the Blind's "Circle of Life" science camp.

It turns out there's a small company in Kentucky called Serra Designs that manufactures cold-cast resin polymer miniature reproductions of asteroids; I thought they could use my software and make the Mars terrain models too. OTT helped me go through the Software Release process to allow Serra Designs to access my program.

So a company might make the Mars terrain models?

Exactly. I keep getting requests for these models from educators, and a company like Serra Designs would be in a much better position to provide these teachers what they need. I've been in contact with the company recently and am encouraging them to exhibit the Mars models at science meetings. If the response warrants it, they might take the plunge and acquire the rapid prototyping machine they would need to create the originals for the castings.

OTT really has helped you take your technologies to new places, hasn't it?

Yes. You know, our work at NASA tends to be narrowly focused. Through technology transfer, we can see some fairly narrow ideas get applied in a wide variety of ways. Our innovations may be useful beyond our original intent.

Do you have any advice for your colleagues as they head into technology transfer efforts?

The process is not time-consuming for us as inventors, but it does take time and can seem to be a slow process. So the best thing is to remember technology transfer early in your work. Doing so helps you avoid the disclosure issues and other speed bumps that can prevent you from getting a patent. It's definitely a good idea to involve the Office of Technology Transfer early on.

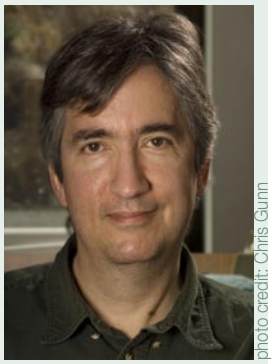


photo credit: Chris Gunn

Code: 691

Years at NASA: 21

Born: Panama ("I was an Army brat")

Education:

- Ph.D., physical chemistry University of Maryland
- M.S., physical chemistry, Texas Tech University
- B.S., mathematics, Texas Tech University

Out and About with OTT

Staff from Goddard's Office of Technology Transfer, as well as Goddard's scientific and research staff, attended the following recent events. Some of these events were hosted by OTT. These events help advance the achievement of Goddard's technology transfer goals.

Event	Outcomes
56th International Astronautical Congress Oct. 17–21, 2005 Fukuoka, Japan	• Presented papers on NASA's partnering mechanisms, the social benefits of space spin-offs, and using tech transfer principles to guide R&D • Networked with potential partners
***NASA Tech Briefs* Nano Conference 2006** Nov. 10–11, 2005 Boston, Massachusetts	• Viewed the latest in nanotechnology • Networked with potential partners
Joint Venture Workshop* Nov. 15, 2005 Cambridge, Massachusetts	• Presented Goddard's needs related to information technology, robotics, microelectronics, and instruments and sensor technology • Networked with potential partners • Following up on 11 leads
Sensors Government Expo & Conference Dec. 6–8, 2005 Virginia Beach, Virginia	• Learned of cutting-edge sensors and detectors technologies • Networked with potential partners • Following up on 2 qualified leads
Introduction to NASA Goddard Technology Transfer* Dec. 6, 2005 Feb. 24, 2006 Goddard Space Flight Center	• Presented tech transfer policies and procedures • Explained the importance of and the innovator's role in tech transfer

* Hosted by Goddard's Office of Technology Transfer

Upcoming Meetings and Deadlines

SIGN UP TODAY!

for the next

"Introduction to NASA Goddard Technology Transfer"

an OTT training program for scientists and engineers

May 23, 2006
9:00 am–12:00 noon
Bldg. 1, Room E100E

contact:
Dale Hithon • 6-2691
Dale.L.Hithon@nasa.gov

Remember to file your New Technology Report before the submission deadline
For more information, contact the Office of Technology Transfer (6-5810 or techtransfer@gsfc.nasa.gov)

meeting	date/location	deadline	web site
International Conference on Optical Fiber Sensors	Oct. 23–27 Cancún, México	May 9, noon (4-page summary and 35-word abstract)	http://www.cio.mx/WEB-OFS18/INDEX.html
IEEE Compound Semiconductor Integrated Circuit Symposium	Nov. 12–15 San Antonio, TX	May 15 (<4-page abstract)	http://www.csics.org
Materials Research Society Fall Meeting	Nov. 27–Dec. 1 Boston, MA	June 20 (300-word abstract)	http://www.mrs.org/fall2006
AIAA Guidance, Navigation, and Control Conference and Exhibit	Aug. 21–24 Keystone, CO	Aug. 7 (manuscript)	http://www.aiaa.org/content.cfm?pageid=230&lumeetingid=1305

Awards

Many awards are available to NASA researchers, as managed by the Inventions and Contributions Board (ICB):

- Space Act Board Awards are bestowed for technologies with significant scientific and technical contributions. ***Value:*** Up to $100,000
- Patent Application Awards recognize the filing of a full (i.e., nonprovisional) patent application. ***Value:*** $500 (more than one inventor) or $1,000 (sole inventor)
- Software Release Awards are given when a software program has been approved for some form of public release. ***Value:*** $500 (more than one inventor) or $1,000 (sole inventor)
- Tech Brief Awards are given for technologies approved for publication in *NASA Tech Briefs*. ***Value:*** $350

To be eligible for any of these awards, innovations must have a New Technology Report on file. For the Space Act Board Award, NASA Form 1329 also must be completed.

OTT can help with the award application process. For more information:

- Go to the Awards page in the "News and Events" section of OTT's Web site (http://techtransfer.gsfc.nasa.gov)
- Contact the Award Liaison Officer: Dale Hithon (6-2691; Dale.L.Hithon@nasa.gov)

For more information on filing a New Technology Report:

- Go to eNTRe, the electronic filing system (http://entre.nasa.gov)
- Contact OTT (6-5810; techtransfer@gsfc.nasa.gov)

The following are awards issued by ICB between October 1, 2005 and February 23, 2006.

Space Act Board Award

Global Change Master Directory's MD9 by Lola Olsen (Code 610.2), Robert Northcutt (Global Systems and Technology), Christopher Gokey (Science Systems and Applications, Inc. [SSAI]), Rosy Cordova (SSAI), and Eugene Major (SSAI)

Patent Application Awards

Demiseable Momentum Exchange System by Milton Davis III (Code 596), Eliezer Ahronovich (Code 596), and Russell Roder (Code 596)

Large Area Vacuum Ultra-Violet Sensors by David Franz (Raytheon) and Shahid Aslam (Raytheon)

Method and Associated Apparatus for Capturing, Servicing, and De-Orbiting Earth Satellite Using Robotics by Richard Burns (Code 571), James Corbo (Code 599), Jill Holz (Code 542), Frank Cepollina (Code 442), and Nicholas Jedrich (Code 599)

Pivot 2.0: Radiation Hardened Fast Acquisition/Weak Signal Tracking System and Method by Steve Sirotzky (QSS Group), Gregory Boegner (Code 596), and Luke Winternitz (Code 596)

System and Method of Analyzing Vibrations and Identifying Failure Signature in the Vibrations by Norden Huang (Code 614.2) and Liming Salvino (Naval Surface Warfare Center)

Systems, Methods, and Apparatus for Direct Implementation of Formal Specifications Derived Mechanically from Information Requirements by Michael Hinchey (Code 581), James Rash (Code 588), Christopher Rouff (SAIC), Denis Gracanin (Code 581), and John Erickson (Code 581)

Systems, Methods, and Apparatus for Verification of Knowledge-Based Systems by James Rash (Code 588), Christopher Rouff (SAIC), Denis Gracanin (Code 581), John Erickson (Code 581), and Michael Hinchey (Code 581)

Virtual Feel Capaciflectors by John Vranish (Code 544)

Software Release Awards

Global Change Master Directory's MD9 by Lola Olsen (Code 610.2), Robert Northcutt (Global Systems and Technology), Christopher Gokey (Science Systems and Applications, Inc. [SSAI]), Rosy Cordova (SSAI), and Eugene Major (SSAI)

Tech Brief Awards

Absolute Cartesian Encoder by Douglas Leviton (Code 551)

Alignment Cube for Cryogenic, Optomechanical Assemblies by John Hagopian (Code 551) and Raymond Ohl (Code 551)

Broadband Phase-Retrieval for Image-based Wavelength Sensing by Bruce Dean (Code 551)

Development of a 1,024x1,024 GaAs QWIP Detector Assembly by Murzy Jhabvala (Code 550) and Kwong-Kit Choi (Army Research Lab)

Development of an Improved Upper Stage Ignition System by Michael Cropper (Code 548), Herb Morgan (Code 548), and John Hickman (Code 548)

Earth Observing System Data Gateway (EDG) by Robin Pfister (Code 586)

Filter Function for Wavelength Sensing and Control Over an Extended Field of View by Bruce Dean (Code 551)

Fixed Lens Wavelength Sensing by Bruce Dean (Code 551)

General EQFlux by Edward Gaddy (Code 563)

High Torque Circular Electrical Connector Tool, EVA Crew Aids and Tools by Patrick O'Neil (Swales)

Innovative Utilization of the Heap Data Structure for Efficient Determination of Best Merges for HSEG by James Tilton (Code 606.3)

Iterative Transform Phase-Retrieval Utilizing Adaptive Diversity by Bruce Dean (Code 551)

Mercury Shopping Cart Interface (MSCI) by Robin Pfister (Code 586)

Phase-Oriented Gears by John Vranish (Code 544)

Power User Interface (PUI) by Robin Pfister (Code 586)

Reconfigurable Decentralized Framework for Formation Flying Control by Joseph Mueller (Princeton Satellite)

SMART Solar Sails by Steven Curtis (Code 695)

Solvent-Free Batch for the Manufacture of a New Generation of Highly Efficient Themoelectric Coolers by Ali Boufelfel (Sigma Technologies)

Split-Remerge Method for Eliminating Processing Window Artifacts in RHSEG by James Tilton (Code 606.3)

Stress Boots by Howard Wood (Code 551), Michael Correia (Code 551), Jason Budinoff (Code 551), and Jessica Hauss (intern)

Three-Degree-of-Freedom Parallel Manipulator w/3 Inextensible Limbs and Base-Mounted Actuators by Farhad Tahmasebi (Code 542)

Three-Dimensional Solid Models of Scientific Data for Education Outreach by John Keller (Code 691)

Tightly Packaged Integral Flexure Mount Design for Cryogenic, Metal Mirrors for Astronomy Instruments by Said Zewari (Code 540) and Raymond Ohl (Code 551)

Use of Strain Gages to detect Bonded Joint Failures of Integrated Science Instrument Module (ISIM) at Cryogenic Temperatures by Brian Harris (Code 541)

Virtual Feel Capaciflectors by John Vranish (Code 544)

metrics

Tech Transfer Metrics: October 1, 2005 to February 23, 2006

New Technology Reports: 56

**Software approved for release*

Aerodynamic Design of a Propeller for High-Altitude Balloon Trajectory Control by Airfoils, Inc.

AlGaN Ultraviolet Detectors for Dual Band UV Detection by MEI Technologies, Inc.

Automated IR Image Damage Detection Algorithm with Quantitative Error Threshold* by Brian Ottens (Code 553), Ajay Chandhok (intern), and Bradford Parker (Code 541)

Autonomic Quiescence by University of Ulster Northern Ireland

Autonomic Smoke Detector by University of Ulster Northern Ireland

Blocking Contacts for N-Type Cadmium Zinc Telluride (CdZnTe) by Muniz

Coarse Alignment Technology of a Large Segmented Mirror by ITT Space Systems Division

Core Flight Executive (cFE) and **cFE Application Program Interface (API)*** by The Hammers Company

Demonstration of 4H-SiC Visible Blind EUV and UV Detectors with Large Detection Area by Rutgers University

Development of Ultra High Sensitivity UV SiC Detectors* by Muniz

DocBUILDERsolo* by SSAI

Empirical Assurance of Embedded Software Using Realistic Simulated Failure Modes* by Triakis Corporation

Enhancing R2D2C Requirements Based Programming with Automata Learning by SAIC

F Unit* by SGI, Inc.

General Mission Analysis Tool* by Thinking Systems, Inc.

Goddard Mission Services Evolution Center (GMSEC) Architecture and **GMSEC Application Programming Interface (API)*** by Computer Science Corporation, Inc.

GMSEC Message Bus (MB)* by John Bristow (Code 583) and Arturo Mayorga (Code 583)

High-Speed Magnetostrictive MEMS Actuated Mirror Deflectors by University of Maryland at Baltimore County

InSpec – Automated Review System by Galaxy Global Corporation

Instrument and Method for X-Ray Diffraction, Fluorescence, and Crystal Texture Analysis without Sample Preparation by USRA

IV&V Technique for Object Oriented Software Systems (CI03)* by L3 Communications and GSI

Low-Cost and Lightweight Three-Stage Radiative Cooler for Cooling Focal Plane Array or CCD to 140 K or Colder by Michael Choi (Code 545)

Low-Power Intelligent Tool Environment (LITE) for FPGAs by University of Southern California

LTM–LACE Task Manager* by John Dorband (Code 606.2)

Magic Bullet: Real-Time Anytime Treatment Learning* by Bart Massey Inc.

Matlab-CodeV Toolkit* by Joseph Howard (Code 551), Blair Unger (Code 551), and Mark Wilson (Code 551)

Matlab-OSLO Toolkit and **Matlab-Zemax Toolkit*** by Joseph Howard (Code 551)

Method for Developing and Maintaining Evolving Systems with Software Product Lines* by University of Seville

Miniaturized Radiation Spectrometer Development by Epaminondas Stassinopoulos (Code 561)

Modeling, Specifying, and Deploying Policies in Autonomous and Autonomic Systems Using an AOSE Methodology by University of Seville

Nanophase Dispersion Strengthened Invar 36 by Timothy Stephenson (Code 541)

Novel Electronic Component Mounting to Achieve High Board Density by Orbital Sciences Corporation

Parameterization of the POD-based Dynamical System Coefficients by Virginia Kalb (Code 614)

Process for Cleaning and Treating Aluminum to Produce Highly Wettable Surfaces for Water and Hydrazine by Angeles Crest Engineering

Recent Developments in Hardware-in-the-Loop Formation Navigation and Control* by Emergent Space Technologies

Remote Sensing Analysis of Forest Disturbances by Carnegie Institution of Washington

Reversible Robotic Coaxial Connector by Lloyd Purves (Code 594)

Reusable Object-Oriented Software Package That Implements Instrument Command Building and Argument Validation* by Johns Hopkins University

Registration Toolbox by Jacqueline LeMoigne (Code 588)

Simple, Compact, and Robust Optical Reference System for Lasers with Narrow Linewidth by University of Colorado

SLE Forward CLTU Service (User Side)* by Timothy Ray (Code 584)

Space Robotic Tug System to Transport Cargo in Space, to Assemble and Repair Satellites, and to Dispose of Depleted Cargo* by Swales Aerospace

SpaceWire PCI Card Windows Driver Software* by Microtel LLC

SpaceWire Test FPGA Design by Northrop Grumman

Spatial and Temporal Low-Dimensional Models for Fluid Flow by Virginia Kalb (Code 614)

Specialized Color Function for Display of Signed Data by Virginia Kalb (Code 614)

Stabilization of a POD-Based Dynamical System by Virginia Kalb (Code 614)

Sub-Kelvin Helium-4 Joule-Thomson Refrigerator by Franklin Miller (Code 552)

Superpressure Tow Balloon for Extending Durations and Modifying Trajectories of High-Altitude Balloon Systems by GSSL, Inc.

Synergistic Habitation System (SHS) for Artificially Derived Forces from Directed Fluid Flow by Mindy Jacobson (Code 542)

Tandem Experiments in Finding Faults during Model-Based Development by L3 Communications and GSI

TARA (Toolbox for Automated Registration and Analysis): A Web-Based Image Tetrahedral Exoskeleton for Segmented Struts (TESS)* by Steven Curtis (Code 695)

Ultra-Stable Miniature Seed Laser for High-Power Nd: YAG Lasers by AdvR, Inc.

Issued Patents: 4

U.S. Patent No. 6,959,554: Passive Gas-Gap Heat Switches for Use with Adiabatic Demagnetization Refrigerators by Peter Shirron (Code 552) and Michael DiPirro (Code 552)

U.S. Patent No. 6,963,993: Standard Autonomous File Server (SAFS) by Susan Semancik (Code 708)

U.S. Patent No. 6,966,820: Process for Producing High-Quality Optically Polished Surfaces on Bare Aluminum Substrates by James Lyons (former employee)

U.S. Patent No. 6,990,436: Time Frequency Analysis Based on Extema Sifting by Norden Huang (Code 614.2)

Patent Applications Filed: 1

Hardware and Technique for Dead-End Welding of All Types of Tubing by Michael Wilks (Code 597)

Provisional Patents Filed: 6

Adaptive Sensor Fleet (ASF) by Jeffery Hosler (Code 588), et al.

Automated IR Image Damage Detection Algorithm with Quantitative Error Threshold by Brian Ottens (556), Ajay Chandhok (volunteer student), and Bradford Parker (Code 541)

Enhancing R2D2C Requirements Based Programming with Automata Learning by SSAI

Generation and Verification of Policies for Autonomic Systems by SAIC

Global Alert Resolution NETwork (GARNET) by SSAI

Space Plasma Alleviation of Regolith Concentrations in Lunar Environments (SPARCLE) by L3 Communications