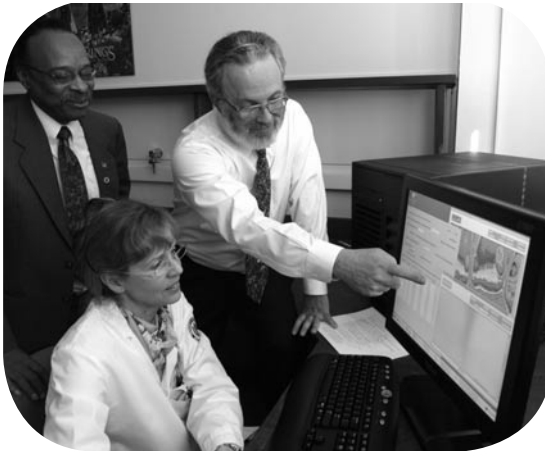


Recursive Hierarchical Segmentation Software (RHSEG) Improving Medical



Pictured left to right: Fitz Walker, Bartron Medical Imaging, LLC, Drs. Jennifer Diederich and Alan Lurie, School of Dental Medicine, Univ. of Conn. view dental x-ray images with the Med-Seg™ Viewer.

We know that space program technologies can play an important role in the U.S. economy and **Dr. James Tilton's** (Code 935) Recursive Hierarchical Segmentation Software (RHSEG) technology does that and more. Recent licensing of the technology has resulted in a product that can both speed up and improve medical diagnoses, resulting in more timely and accurate treatment.

The RHSEG technology offers an approach to image analysis that looks at sets of hierarchically related regions of an image as opposed to individual pixels. After licensing HSEG (the predecessor of RHSEG), Bartron Medical Imaging, LLC has developed a device (Med-Seg™) that gives medical professionals more detailed image information for digitized scans such as MRI, CT, PET, ultrasound, mammograms, dental x-rays, etc., resulting in quicker, more accurate, and more definitive diagnoses.

Because of the RHSEG segmentation approach, medical professionals can now "see" images that were not previously visible to the human eye. Med-Seg™ can also isolate a segment of the image that is of specific interest and compare it to many reference images.

Bartron learned of HSEG at NASA's New Partnerships in Medical Diagnostic Imaging Workshop in 2001. Bartron viewed HSEG as key to differentiating difficult-to-see details from a complex matrix background. They worked closely with the Office of Technology Transfer (OTT) and NASA's Northeast Regional Technology Transfer Center, the Center for Technology Commercialization to license HSEG/RHSEG.

The RHSEG technology was originally designed for Earth remote-sensing applications but as mentioned above, can be highly beneficial in many imaging applications. ■

Goddard's Award Winners

Recently, six Goddard inventions won awards. Four technologies won **NASA Space Act Board Awards** for their significant scientific and technical contributions. Those included:

- ▶ GPS "Compound Eye" Navigation and Attitude Sensor (CEGANS) by **David Quinn** (Code 595), U.S. Patent #6,594,582
- ▶ Adhesive Bubble Removal Technique and Fixture for Fiber Optic Applications by **John Kolasinski** (Code 565), U.S. Patent #6,287,404
- ▶ Heat-Driven Pulse Pump (HDPP) by **Steve Benner** (Code 416) and **Mario Santos Martins** (Swales), U.S. Patent #6,123,512
- ▶ Gear Bearings by **John Vranish** (Code 544), U.S. Patent #6,626,792

Two technologies won the **Mid-Atlantic Federal Laboratory Consortium (FLC)** award. Those technologies are, **Dr. James Tilton's** (Code 935) Hierarchical Segmentation Software (HSEG) technology and **Russell Carpenter's** (Code 595) (et al) GPS-Enhanced Onboard Navigation System (GEONS/GEODE). ■

Step 5: Technology Application and Success Promotion

- Once the final license or Space Act Agreement has been signed (see the Spring 2004 issue of *Goddard Tech Transfer News* for more information about negotiating the partnership/license agreement), the Office of Technology Transfer (OTT) announces the "success story" by issuing press releases, putting it on the Web site, getting a Tech Brief feature article, or other trade journal articles. Sometimes there are even videos produced. OTT also seeks awards for the inventor.

Note: This series is examining the steps associated with spin-out of Goddard innovations to non-NASA applications. Future issues of *Goddard Tech Transfer News* will explore the technology spin-in process.

Why does OTT promote technology transfer success stories?

Much can be gained by publicizing the successful transfer of space program technologies to the commercial or academic sectors. First, with a versatile technology, transfers to more than one partner/licensee may be possible. Therefore, announcing the technology's successful transfer can attract additional interest in the featured technology. Success stories help demonstrate the value of NASA as a viable source for technology through achieving benefits on Earth as well as the long-term science benefits in space.

How/Where are the success stories announced?

The OTT publishes several documents announcing technology transfer successes. Success stories are announced in a yearly report published each spring and in videos, both of which are made available on OTT's Web site (<http://techtransfer.gsfc.nasa.gov>). Success stories are also submitted to *NASA Tech Briefs*, *Spinoff* magazine, and select professional and trade publications.

Additionally, the OTT works with Goddard's Public Affairs Office to distribute success story information to the media.

What awards would I, as the inventor, be eligible for?

Although many awards are available for innovative technologies themselves, several awards are given that require technology transfer. For example, NASA gives out the Commercial Invention of the Year Award, which includes a monetary award of up to \$100,000. Technology transfer awards given by outside organizations include the following:

- ▶ R&D 100 Award
- ▶ Space Foundation Hall of Fame Award
- ▶ Mid-Atlantic Federal Laboratory Consortium Award
- ▶ Innovations in Government Award
- ▶ Tech Museum Award

For more information about awards visit the OTT Web site: <http://techtransfer.gsfc.nasa.gov>

Do I need to fill out the award application forms?

Because much of the information needed to complete the award application forms is already on file with OTT (starting with the New Technology Report form 1679), OTT will complete the first draft of the award application for your review. While your input on the application is essential, OTT's goal is to take a minimal amount of your time. ■

Next issue – Step 6: The Spin-In Process

The tech transfer process:

Step 1: Scientific/Technical Staff Submit NTR

Step 2: Technology Assessment

Step 3: Seeking a Partner/Licensee

Step 4: Partnership/License Agreement

Please visit our Web site at <http://techtransfer.gsfc.nasa.gov> to learn more about each step of the technology transfer process.

researcher profile:

John Kolasinski

Code 565 • 15 years at NASA • **Education:** BSEE, University of Maryland, College Park, MD, 1985.

• **Born:** Milwaukee, Wisconsin

bubbles in adhesives for fiber optics and other applications with similar manufacturing processes.

What has OTT done to introduce your invention to new users?

In April of this year, I presented the technology at a Joint Venture Opportunity Workshop in Rochester, NY sponsored by NASA's Northeast Regional Technology Transfer Center (RTTC). It was a great networking opportunity for potential partners.

What do you see as the future for your technology?

A really exciting thing about this technology came about because we needed a way to detect bubbles without destroying fiber optic assemblies. We began working on new ways to x-ray fiber optics to check for bubbles in finished assemblies. That led us to some commercial companies such as Bartron Medical Imaging that uses **Dr. Jim**

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What invention are you currently working to transfer?

Currently, OTT has been assisting me in promoting my adhesive bubble remover, which is a fixture and method that reduces, and potentially eliminates,

Goddard Participates in SAMPE's 60th Anniversary at the 2004 SAMPE Conference

This year marked the 60th anniversary of the Society for the Advancement of Material and Process Engineering (SAMPE). The annual conference, held May 16–20, in Long Beach, CA, welcomed 4900 attendees from industry, academia, and government labs, all seeking cutting edge information in advanced materials, nanotechnologies and polymeric nanocomposites.

At a NASA-sponsored luncheon, keynote speaker **Dr. Harley Thronson**, Director of Technology in the Office of Space Science at NASA Headquarters, spoke on NASA's latest accomplishments. While his focus was on NASA's two rovers on the surface of Mars and the exciting discoveries yet to be made, he also laid out NASA's bold new vision for exploring our Solar System and beyond.

The GSFC OTT highlighted several technologies at the NASA booth. Two of these technologies, the Real Time Parylene Sensor and the Adiabatic Demagnetization Refrigerator (ADR), generated specific interest, which the OTT is actively pursuing. ■



High Interest at Goddard's First Venture Capital Project Workshop



Panel discussions at the workshop featured (l to r) Jim Poulos, UMD, Steve Fritz, TEDCO, Steve Fredrick, Novak Biddle Venture Partners, Irl Duling, Optnel Systems, Mark Grovic, New Markets Growth Fund.

(TEDCO), representatives from the UMD Technology Commercialization Office, and GSFC personnel including: **Nona Cheeks**, Chief, NASA Goddard Office of Technology Transfer; **Owen Barwell**, NASA Enterprise Engine; **John Fini**, NASA Technology Transfer Incubator (Emerging Technology Center); **Jonathan Root**, NASA Program Executive, Innovative Partnership Program; and **Bryan Geurts**, Patent Attorney, Office of Patent Counsel.

Through several panel discussions, the workshop presented to 87 attendees (48 Goddard inventors) topics ranging from partnering with start-up companies to investing in technology development. ■

To foster development of high impact collaborations as well as help build inventor interest in technology transfer partnerships, Goddard hosted a Venture Capital Project Workshop. Held on June 29th at the NASA Goddard Visitor Center, the event was cosponsored by the University of Maryland (UMD) Office of Technology Commercialization (OTC) and the R.H. Smith School of Business.

Speakers at the event included three VCs, Novak Biddle Venture Partners, SpaceVest, and New Markets Growth Fund, Maryland Technology Development Corporation

Upcoming Events

NASA Technology Transfer Investment Workshop, October 29, 2004, Greenbelt Marriott, Greenbelt, MD

This workshop is an opportunity for GSFC researchers to further explore investment with angel, seed, and venture capital experts. The objective is to establish working relationships and provide attendees with valuable information to attract high-impact collaborations for their technology. One of the main goals is to accelerate the utilization of NASA technology throughout the region through partnerships with the investment community.

NASA Tech Briefs Nano 2004 Conference, November 11 & 12, Wyndham, Baltimore, MD

Tech Briefs' second annual nanotechnology conference will focus on the latest "small tech" innovations developed at NASA and other U.S. federal laboratories. This venue will provide opportunities to learn about potential funding and partnering, as well as to network with influential players in the nanotechnology arena. Experts from various federal labs, universities and companies will discuss the trends in R&D and provide insight on nanotech's true market potential. ■

Tech Transfer Metrics – April 1 to June 30, 2004

New technologies reported: 32

New technologies were reported by the following civil servants, contractors, and universities.

Civil Servants

Code 500

Eddie Akpan: Decomposition of Higher Order Transfer Functions (TFNS) to Sum or Product of Lower Order TFNS

Wes Alexander: Unitary Graphite Composite Hinge

Edgar Canavan: ADR Salt Pill Design and Crystal Growth Process for Hydrated Magnetic Salts

Rene Carlos: Unitary Graphite Composite Hinge

David Clark: Theodolite Ring Light

Bruce Dean: Iterative-Transform Phase-Retrieval Utilizing Adaptive Diversity; Broadband Phase-Retrieval for Image-Based Wavefront Sensing

Michael DiPirro: ADR Salt Pill Design and Crystal Growth Process for Hydrated Magnetic Salts

James Geiger: Land Information System Version 2.0 Software

Luther Lighty: Land Information System Version 2.0 Software

Walt Moleski: Can I Buy

Diane Pugel: Template for Deposition Of Micron and Sub-micron Pointed Structures

Jacob Rosenberg: Mercury Laser Altimeter Onboard Science Algorithms—Reusable Software

Peter Rossoni: Unitary Graphite Composite Hinge

Peter Shirron: ADR Salt Pill Design and Crystal Growth Process for Hydrated Magnetic Salts

James Sturm: Unitary Graphite Composite Hinge

Code 600

John Keller: 3-Dimensional Solid Models of Scientific Data for Education and Outreach

Code 700

Farhad Tahmasebi: Three Degree-of-Freedom Parallel Manipulator with Three Inextensible Limbs and Base-Mounted Actuators

Code 900

Paul Houser: Land Information System Version 2.0 Software

Contractors

Aker Industries
ASRC Aerospace Corporation
Booz Allen & Hamilton, Inc.
Cornell Research Foundation, Inc.
Gedeon Associates
GEST UMBC
Sunpower, Inc.
The Scripps Research Institute
Tini Alloy Co.

Universities

Johns Hopkins University/
Applied Physics Lab
New Mexico State University at
Las Cruces
Pennsylvania State University
Portland State University
University of Arkansas
University of California at
Berkeley
University of Southern
California

Licenses/Partnerships: 2

- ▶ Prototype License Application for Capaciflector Technologies, **John Vranish** (Code 544), licensed to Nytec, Inc. of Seattle, WA
- ▶ Systems and Methods for Determining Spacecraft Orientation, **Richard Harman** (Code 572), licensed to A.I. Solutions, Lanham, MD

Issued Patents: 3

Innovators receive a \$500 to \$1,000 award for an issued patent.

- ▶ U.S. Patent #6,740,224: Innovative Manufacturing Procedure for Low Cost and High Quality Carbon Nanotubes, Jeannette Benavides (Code 562), Henning Leidecker (Code 310), and Jeffrey Frazier (Swales)
- ▶ U.S. Patent #6,738,734: Empirical Mode Decomposition Apparatus, Method and Article of Manufacture for Analyzing Biological Signals And Performing Curve Fitting, **Norden Huang** (Code 971)
- ▶ U.S. Patent #6,744,470: Synchronization of Video Recording and Laser Pulses Including Background Light Suppression, **Michael Tierney** (Code 920.3), **James Kalshoven** (Code 925), and **Philip Dabney** (Code 925)

Patent Applications Filed: 1

Provisional Patents Filed: 8 ■

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profile: **Kolasinski** (continued from page 1)

Tilton's HSEG technology. Our collaboration with them, along with the University of Albany and an X-Ray company in New York (Lawrence Ripak), is now leading to new areas for digital x-rays. This could have implications in detecting breast cancer, examining aerospace parts, and other areas.

Any advice for your colleagues?

My advice to other inventors is to remember you are most familiar with your technology. Take the time to write the invention disclosure. (They get easier after the first one.) Work with the OTT and participate with marketing efforts. I regularly attend standards meetings and conferences and present my technology when possible. I am essentially working for the OTT helping them transfer NASA products. We all benefit from it. ■