



FEDERAL LABORATORY CONSORTIUM
FLC
FOR TECHNOLOGY TRANSFER

*The Only Government-wide
Forum for Technology
Transfer*

**FLC
Communications
Tools for Federal
Labs, Industry, and
Academia**

**Al Jordan
FLC Communications Chair
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AL JORDAN

- FLC Communications Committee Chair (2001-Present)
- Member, FLC Executive Board (2001-Present)
- Project Manager, Office of the Chief Information Officer, NASA's George C. Marshall Space Flight Center
- Extensive experience in agency strategic planning, communications planning, communications technology
- Assessed commercial potential of emerging technologies
- Negotiated various technology transfer agreements for NASA's Marshall Center



FLC WEBSITE

- www.federallabs.org
- Lab profiles
- T2 news
- T2 events listing
- T2 resources

atory Consortium for Technology Transfer - Mozilla Firefox

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FLC <http://www.federallabs.org/>

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The Only Government-wide Forum for Technology Transfer

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NewsLink

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FLC Billboard

FLC NewsLink
 Provides information on all facets of the federal laboratory system

FLC TechTicker

Top Stories

- [AFRL Solar Cells Power NASA's Mars Rovers](#) NEW
- [Needing a Hydrogen Breakthrough](#) NEW
- [SRNL's SmartLatch™ Going to WBET](#) NEW
- [FAA to Better Air Traffic Control](#) NEW
- [Wavelets, Mathematics Detect Mines, Cancer](#) NEW
- [Beverage Tech Money](#) NEW

Upcoming Technology Transfer Events

- [04/02-04/04 - Nano Nexus 2007, Oak Ridge, TN](#)
- [04/11-04/12 - 2007 California Pavement Preservation Conference, Oakland, CA](#)
- [04/16-04/19 - SAE 2007 World Congress, Detroit, MI](#)
- [04/18-04/19 - Composite Materials, Design, Testing & Fabrication Seminar, Chicago, IL](#)

T² Fact

VisiCalc, invented by Dan Bricklin and Bob Frankston in 1979, was the first computer spreadsheet program. VisiCalc was released in 1979 and ran on an Apple II computer. While most early microprocessor computers had been quickly supported by BASIC and a few games,

What is the FLC?

The Federal Laboratory Consortium for Technology Transfer (FLC) is the nationwide network of federal laboratories that provides the forum to develop strategies and opportunities for linking laboratory mission technologies and expertise with the marketplace.

The FLC was organized in 1974 and formally chartered by the Federal Technology Transfer Act of 1986 to promote and strengthen technology transfer nationwide. Today, more than 250 federal laboratories and centers and their parent departments and agencies are FLC members.

Making the Connection
 Arlington, Texas
 May 15-18, 2007

Featured Laboratory



FLC NEWSLINK

- Monthly publication
- General discussion of federal tech transfer
- Stories recruited from various labs
- 6400 subscribers

T¹ INSIDE

 Vitamin D Deficiency page 2

 Pollution Control page 3

 Ensuring Clean Water page 6

T² EVENTS

FLC Mid-Continent/Far West Regional Meeting
 Colorado Springs, Colo.
 August 29-31, 2006

NASVE 2006 Annual Conference
 Rochester, N.Y.
 September 20-22, 2006

FLC Midwest/Southeast Regional Meeting
 Nashville, Tenn.
 October 25-27, 2006

Partners in Environmental Technology Technical Symposium
 Washington, D.C.
 November 28-30, 2006

FLC National Meeting
 Arlington, Texas
 May 15-18, 2007

T² FACT

Invented in 1871, the first "ordinary" bicycle was invented by British engineer James Starley. Known as the Penny Farthing, it was the first really efficient bicycle, consisting of a small rear wheel and large front wheel pivoting on a simple tubular frame with tires of rubber.

Mary Bellis, About.com

NEWSLINK

August 2006

ARGONNE TESTS VALVES FOR DIESEL, GAS ENGINES

Advanced ceramics are the leading candidates for high-temperature engine applications — offering improved engine performance and reduced emissions. One type of ceramic, silicon nitrides, is being evaluated for use in valve train materials for diesel and natural gas engines. Because they operate in high-stress, high-temperature, corrosive environments, these materials must be highly durable and reliable. Accurate and efficient surface and subsurface characterization methods are essential to identify damage caused by machining and to ensure the reliability of the valves. A group of researchers at Argonne National Laboratory (ANL), led by J.C. Sun, have been investigating nondestructive evaluation (NDE) methods to detect surface and subsurface defects caused by abrasive machining processes. Such defects — which include microstructural discontinuities such as spalls, cracks, and voids — are typically within 200 µm of the material's surface and can significantly degrade the fracture strength and fatigue resistance of silicon nitride ceramics. Because these ceramics are partially translucent in light, a laser-scattering method based on the detection of optical scat-

See Argonne Engine Valves, page 8

SANDIA'S TUFFOAM™ CHURNS UP WAVES OF INDUSTRY INTEREST

by Nancy Garcia, LANL

When surfboard material manufacturer Clark Foam closed shop last year, the nation's \$200-million surfboard manufacturing market appeared headed for a wipeout. Hearing the news, Sandia National Laboratories' (SNL) LeRoy Whinnery, who describes himself as "a warm-water surfer" (as opposed to his wife, whom he says "will surf anywhere"), believed he just might have a solution — a foam initially developed to protect sensitive equipment from harsh mechanical environments, known as TuffFoam™. Now two licensees are evaluating the SNL-developed foam for this use, and scores of inquiries are being explored about this field and other uses, including insulation and structural core applications. The material is a water-blown, closed-cell, rigid polyurethane foam that features formulations with densities as low as 2 pounds per cubic foot. News of TuffFoam being considered as a potential replacement for surfboard manufacturing has spread rapidly through news agencies, television, magazines, newspapers, and trade journals since the licensing opportunity was announced in February. "It can be used for thermal and electrical insulation, and potentially as a core material

See Sandia Surfboard, page 4



Originally created for the National Nuclear Security Administration to protect sensitive electronic and mechanical structures from harsh environments, LANL's foam may be ideally suited for surfboard blanks, car bumpers, and airplane wings.

DC ON T²: R&D LABOR FORCE

by Gary Jones, FLC Washington, DC Representative

Greetings from (sweltering) D.C. A great deal has been written over the past year about the U.S. R&D labor force and its ability to continue attracting and developing the quality science and engineering (S&E) workforce necessary to compete globally in technology-intensive industries (see the April/May DC on T²). Several new National Science Foundation (NSF) statistical reports (tabularized data) and an article in a prominent S&T policy journal provide more "grist for the mill" on this general discussion, which I thought might be of interest

See DC on T², page 5

NASA KENNEDY REDUCES GROUNDWATER CONTAMINATION

A groundwater treatment technology developed at Kennedy Space Center (KSC) has won NASA's Government Invention of the Year and Commercial Invention of the Year awards for 2005. The embulsified zero-valent iron (EZVI) technology was developed by a team of researchers from NASA and the University of Central Florida. NASA inventors include Dr. Jacqueline Quinn, an environmental engineer in the Applied Sciences Division of the Kennedy Applied Technology Directorate, and Kathleen Brooks, an analytical chemist in the center's Materials Science Laboratory of the Center

See Groundwater Contamination, page 4



FEDERAL TECHNOLOGY TRANSFER ANNUAL (2006)

- Highlights the people, research, and products behind recent successes in federal technology transfer





FEDERAL TECHNOLOGY TRANSFER 2007 EDITION

- 101 submissions, 34 chosen
- Updated design, added federal labs & academia, labs listing
- New name: *Technology for Today*

NASA Invention Monitors Bridge Integrity, Shuttle Tiles, and Heart Disease

"The capability being created in the van represents the beginning of a paradigm shift in the way states will view and be able to carry out their stewardship of the nation's highway infrastructure."

*Dr. Morton Oskard
 Turner-Fairbank Highway
 Research Center*

A three-year agreement with Turner-Fairbank Highway Research Center (TFHRC) has enabled scientists to learn how to apply NASA Goddard Space Flight Center's Hilbert-Huang Transform (HHT) technology to analyses of traffic flow data, wind and traffic interaction with bridges, and damage detection in pavement and bridges.

These analyses are the basis of TFHRC's digital highway measurement (DHM) project and are the first steps in a dramatic shift in the way state transportation departments will be able to improve the safety and performance of the nation's highway infrastructure.

A revolutionary, adaptive set of signal-analysis algorithms, HHT was developed as part of NASA's oceanography research and was later applied to analysis of wing-flutter tests and the next generation of aircraft design at NASA Dryden Flight Center. The technology has also contributed to Space Shuttle mission safety by testing the tiles that insulate the Shuttle in space for the Shuttle Return to Flight Project following the Columbia accident.

Dr. Norden Huang began developing HHT in 1995. Unlike precursor technologies, HHT provides an effective method for analyzing nonlinear and nonstationary signals while improving the accuracy of linear- and stationary-signal anal-

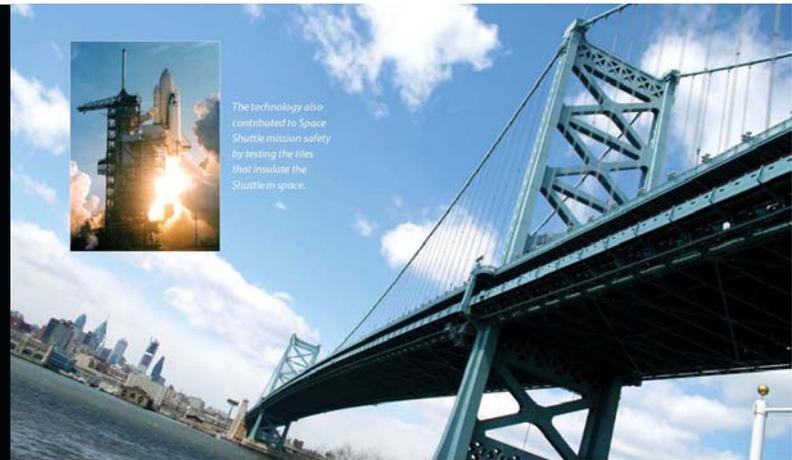
ysis. Because analytical measurements within many areas of science benefit from a quantitative measurement of nonlinear data, HHT is widely applicable to a broad range of fields, including medicine, electronics, the environment, and business. HHT is ideal for structural engineering analyses at TFHRC.

The Space Act Agreement between TFHRC and Goddard was negotiated and administered by the Office of Technology Transfer. Initial contact was made at a seminar attended by Dr. Huang. Officials from TFHRC began discussions with Huang about the potential use of HHT in highway research, and this led to a formal agreement. During the course of the three-year agreement, TFHRC scientists have collaborated directly with Dr. Huang to build an operational model of HHT for their own analyses and to build a knowledge base for using the HHT algorithms within their own staff, working toward the successful DHM project. The resulting DHM van collects and analyzes critical highway safety data, which can lead researchers to better bridge and highway safety, design and construction.

Having successfully built an internal research team skilled in HHT, TFHRC is interested in continuing research with Goddard to address other highway and safety areas. A new agreement may be considered for ongoing collaboration.



The technology also contributed to Space Shuttle mission safety by testing the tiles that insulate the Shuttle in space.



The HHT technology is widely applicable to a broad range of fields, including bridge stability analysis, medicine, electronics, and the environment.

NASA Goddard Space Flight Center
<http://ipp.gsfc.nasa.gov>

The mission of NASA Goddard Space Flight Center is to expand knowledge of the Earth and its environment, the solar system, and the universe through observations from space. To assure that our nation maintains leadership in this endeavor, Goddard is committed to excellence in scientific investigation, in the development and operation of space systems, and in the advancement of essential technologies.



FLC CALENDAR

- Recruited from all labs
- 50 submissions from 36 labs
- 14 included
- Of various interests
- Captions promote labs





STATE AND LOCAL GOVERNMENT

- Promotion of federal laboratory collaborations with state and local government





FLC AWARDS PUBLICATION

- Distribution to *FLC NewsLink* list
- Replaces *FLC NewsLink* awards issue

RZWQM2 for Evaluating, Managing, and Improving Water Quality from Agriculture

Department of Agriculture
 Agricultural Research Service-Agricultural Systems Research Unit



From left, seated: Dr. James Ascough, Dr. Lajpat Ahuja, Dr. Tim Green
 From left, standing: Dr. Luwang Ma, Ken Rojas, Dr. Suresh Anapalli
 Not pictured: Robert Malone

The enhanced Root Zone Water Quality Model (RZWQM2) can evaluate, manage, and improve water quality impacts of agricultural chemicals and other management practices; develop sustainable agricultural systems; and optimize limited resources.

The RZWQM2 is an advanced, but practical, model of root zone processes that influence water quality, soil water storage, efficient water use, and crop production.

The benefits of RZWQM2 are that it provides users with a comprehensive, state-of-the-science, whole-system approach to evaluating management effects on water (and soil) quality and production compared with simpler models that look at potential leaching of chemicals in isolation. It is unique in its emphasis on accurately simulating the effects of agricultural management practices on physical-chemical processes and plant growth, including the movement of water, nutrients, and pesticides through the crop-

root zone to groundwater. The model allows the evaluation of management practices, such as no-tillage and residue cover vs. conventional tillage; rates, methods, and timings of application of water, fertilizers, manures, and various pesticides; and up to 100 years of different crop rotations. It also contains exclusive features of tile drainage and rapid transport of surface-applied chemicals through soil macropores to groundwater and tile flow.

RZWQM2 was transferred to users through personal discussions, training sessions, and collaborative testing/applications; updated versions were delivered through the web. At users' request, an international workshop was held in April 2004 to share experiences and discuss future collaborations to advance the applications. During the past three years, the team has provided training to more than 40 users from the Environmental Protection Agency, the U.S. Geological Survey, and scientists internationally, and provided support to hundreds more. During this period, there have been 500+ downloads of the model. RZWQM2 is now being used by federal agencies, industry, and numerous scientists in the U.S. and worldwide.

Contact

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FLC ADVERTISEMENTS

- Increase general awareness of the FLC and its member laboratories
- Federal labs welcome to leverage ad space
- Ran in *R&D*, *NASA Tech Briefs*, *Washington Tech*

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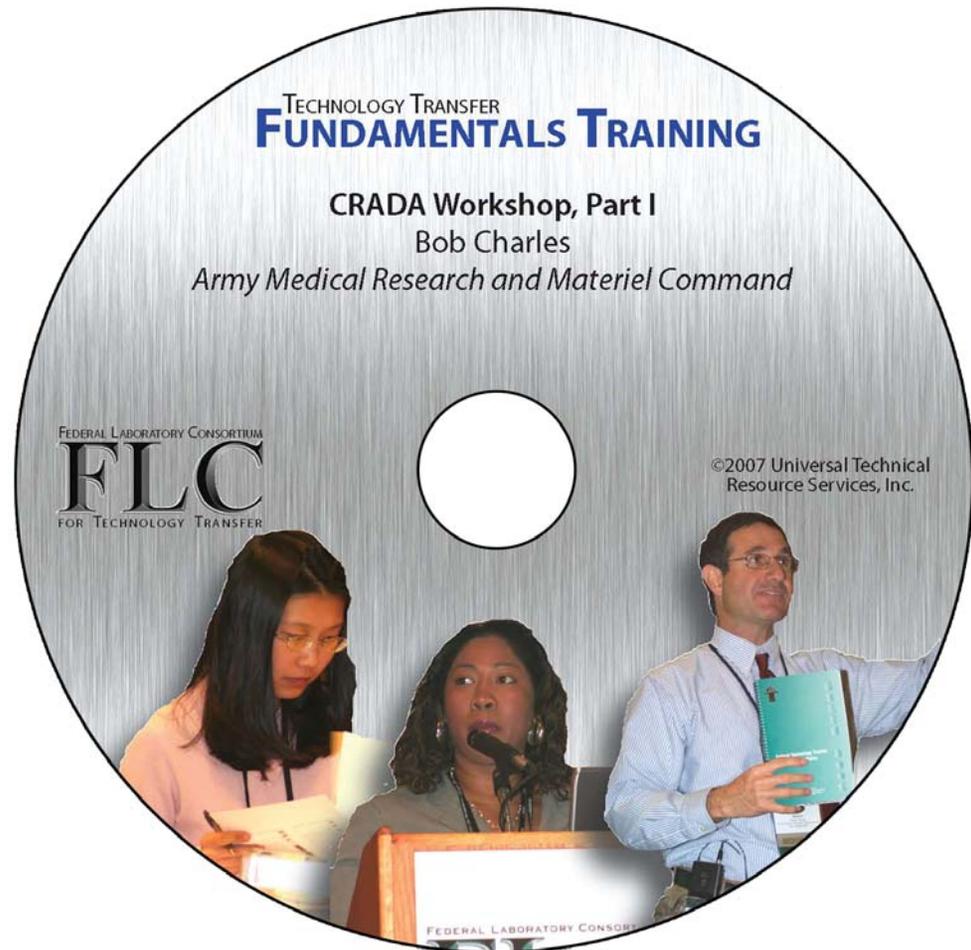
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FLC TRAINING DVDs

- 21 hours of T2 training
- 9 presenters
- Developed in conjunction with FLC Education and Training Committee





TRADE SHOWS

- Leverage FLC booth space to promote lab services, successes
- NDES
- SAE
- SPIE





Electronic Roundtables



FUTURE PROJECTS

- FLC DVD
- 2008 calendar
- FLC text message updates for subscribers
- Advancements on website



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