May/June

FLC NewsLink

2004

Published by the Federal Laboratory Consortium for Technology Transfer
The Only Government-wide Forum for Technology Transfer

Christopher Latham Sholes, a mechanical engineer from Pennsylvania, patented the first typewriter in 1868. He eventually sold the rights to the patent to the Remington Arms Company for $12,000. A colleague of Sholes', James Densmore, suggested the now standard "QWERTY" keyboard to separate commonly used keys in an effort to prevent them from jamming.

World Future Society
Washington, DC
July 31- Aug. 2, 2004

•

FLC Midwest Regional Meeting
Cleveland, Ohio
August 2-4, 2004

•

FLC Mid-Atlantic Regional Meeting
Flintstone, Md.
Sept. 14-16, 2004

•

FLC Mid-Continent Regional Meeting
South Padre Island, Texas
Sept. 7-10, 2004

•

NDES Technology Transfer Conference and Expo
Chicago, Ill.
March 7-10, 2004

Go to:
<www.federallabs.org>
for a calendar of events

FLC Meeting Attendees Take Home Mission-Driven T² Tools

A focus on technology transition that benefits federal agencies through a supplier base set the tone for the FLC annual meeting.

Mission Driven Partnerships, held May 3-6, 2004, in San Diego, Calif., brought together technology and commercialization professionals from around the world and from a multitude of backgrounds.

From laboratory to industry to academia, over 350 specialists converged in sunny southern California to share, discuss, and advance the methods and policies associated with federal technology transfer (T²).

IP expert Emmett Murtha

This year the FLC teamed with the Technology Partnerships Working Group (TPWG) to develop the meeting, adding both depth and variety.

By strengthening the relevancy of T² in agency missions, the FLC strives to advance federal technology commercialization. This advance started with a bang as the Monday T² education and training sessions got underway. T² Fundamentals training was offered to FLC first-timers, and advanced training was offered to the T² veterans in the group.

Fundamentals introduced a packed class of T² professionals to the basics behind transferring federal technology and expertise to the marketplace.

Garage Technology Ventures' Guy Kawasaki

"I arrived with very little knowledge of the T² process and left with a good overview and lots of literature," said Bechtel Nevada's Larry Zajac.

Led by FLC Vice-Chair Larry Dickens, the session included an overview of the history, mission, and vision of the FLC.

The advanced training session, *IP Management and Licensing/Negotiating*, showcased a team of seasoned professionals with extensive experience in patenting, licensing, and negotiating intellectual property.

Presenters included Jesse Erlich of Perkins, Smith & Cohen and Emmett Murtha of QED Intellectual Property.

More meeting images, page 5

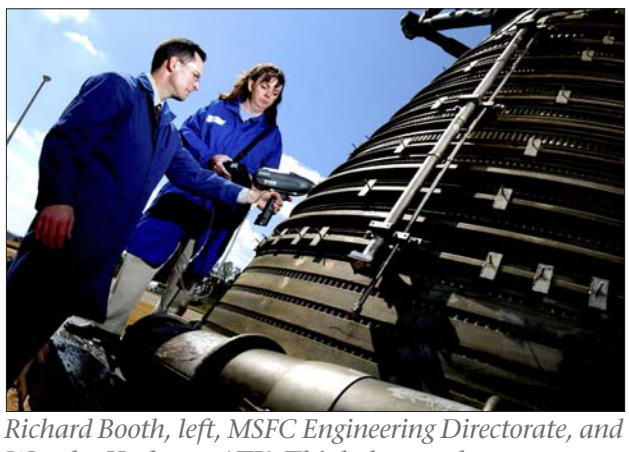
Mission Driven Partnerships attendees take in the FLC T² Fundamentals Training.

On Tuesday, meeting attendees were both informed and entertained by keynote presenter Guy Kawasaki. With his edgy personality, Guy captivated

FLC Conference, page 6

NASA Partners With Industry for Field Chem Analysis

Collaboration between NASA's **Marshall Space Flight Center** (MSFC) and an industry partner has resulted in the development of a portable vacuum X-ray fluorescent analyzer that performs on-the-spot chemical analyses — a task previously possible only in a chemical laboratory.



Richard Booth, left, MSFC Engineering Directorate, and Wanda Hudson, ATK Thiokol, use the scanner to analyze materials in an F-1 engine.

MSFC engineers in Huntsville, Ala., teamed with KeyMaster Technologies of Kennewick, Wash., to develop a "chemistry lab in your hand" that weighs about 4 pounds and is capable of detailed material analysis, even under field conditions. This capability promises to be a boon to the aerospace community because of unique requirements — for instance, the need to analyze Space Shuttle propulsion systems on the launch pad. Those systems provide the awe-inspiring rocket power that propels the Space Shuttle from Earth into orbit in mere minutes.

The newly developed vacuum X-ray fluorescent analyzer can identify and characterize a wide range of elements, and is capable of detecting chemical elements with low atomic numbers — such as sodium, aluminum and silicon. It is the only handheld product on the market with that capability. Aluminum alloy verification is of particular interest to NASA because vast amounts of high-strength aluminum alloys are used in the Space Shuttle propulsion system — the external tank, main engine and solid rocket boosters.

"Being able to bring a full analytical chemical labo-

See NASA Marshall, page 4

DC on T²

Tough times ahead for federal S&T, AAAS analyst warns

by Neil MacDonald
Federal Technology Watch

Bush administration proposals to cut the budget deficit through restraints on domestic spending could have severe consequences on federal support of research and development (R&D) over the next five years, Kei Koizumi, federal R&D budget guru at the American Association for the Advancement of Science (AAAS) said April 22.

Nondefense R&D funding is likely to decline steadily over the next five years under these plans, and nearly every federal R&D program outside the priority areas of defense, homeland security and space would see reduced funding, Koizumi told the more than 600 attendees at AAAS.

Koizumi's forecast is derived from his analysis of more than 1,000 pages of unpublished computer printouts of administration projections, current policy extrapolations and

See DC on T², page 5

Federal Lab Benefits Industry and Wildlife

The NWRC works through research and development to decrease the adverse effects of humans on wildlife.

The **National Wildlife Research Center** (NWRC) is a major facility within the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service's (APHIS) Wildlife Services program.

The NWRC provides scientific information on wildlife, its habitat, and its relationship to agriculture and public safety. At the Center and in the field, specialists conduct scientific inquiries into the problems of wildlife damage and look for solutions to these problems.

The NWRC seeks to protect wildlife from the adverse effects of human activities while also reducing the damage and hazards that wildlife causes to agriculture, forests, industry, and other areas of human involvement. The reconciliation of these two conflicting priorities is the challenge that the NWRC faces today.

NWRC's objective is to increase the effective methods available for wildlife damage management through:

See Industry and Wildlife, page 4

Fed Labs Flash

Technology Transfer Notes

PNNL Develops Fellow

Russell Jones, a Laboratory Fellow at the Department of Energy's **Pacific Northwest National Laboratory**, has been elected Fellow of National Association of Corrosion Engineers (NACE) International. Each year the honor of Fellow is presented in recognition of distinguished contributions in the field of corrosion and its prevention.

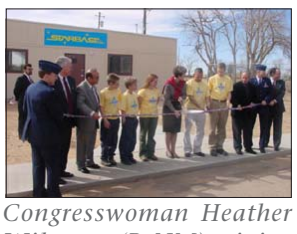
Russell Jones

Jones has more than 37 years of experience in the fields of stress corrosion cracking, high-temperature composites, fusion reactor materials, radiation effects on materials, and the mechanical properties of materials.

He has written more than 200 publications and served as the editor of 13 books and proceedings in his areas of expertise. Jones has been a member of NACE since 1966.

T^2 Benefits Kids

The **Air Force Research Laboratory** recently opened its STARBASE La Luz Academy at Kirtland Airforce Base.



Congresswoman Heather Wilson (R-NM) joins students in cutting the opening-day ribbon at STARBASE.

The extracurricular school offers practical engineering courses in science and math for primary and secondary students interested in future careers with the defense industry.

NETL License to Powerspan

Powerspan issued a press release on March 9 announcing its license of the **National Energy Technology Laboratory** (NETL) in-house patent, "Method for Removal of Mercury from Various Gas Streams" (GP-254 Process).

Preliminary tests of the method conducted in Powerspan's New Hampshire laboratories have shown 90 percent oxidation and removal of elemental mercury from simulated flue gas streams.

The company announced plans for a test program at a power plant, and has renamed the technique as the PCO Process.

Technology Licenses

by Neil MacDonald
Federal Technology Watch

• The Department of the Navy's **Naval Research Laboratory** Technology Transfer Office in Washington, DC, intends to grant an exclusive, revocable, nonassignable license to Seahawk Biosystems Corp. for three inventions: a biosensor using a magnetically detected label (U.S. Patent 5,981,297), a force discrimination array (U.S. Patent 6,180,418), and a fluidic force discrimination (U.S. Patent Application 10/457,705). The proposed fields of use are pathogen detection, disease and infection diagnostic testing, genetic testing for veterinary applications (small and large animals, including equine), pathogen and toxin detection and genetic testing in food processing, pathogen and toxin detection in, and monitoring of, public water, wastewater and groundwater. The licensed territory is the U.S. and certain foreign countries.

• The **National Institutes of Health**'s Office of Technology Transfer is considering the grant of an exclusive, worldwide, royalty-bearing license to Biolex Inc. (Pittsboro, N.C.) for monoclonal antibodies specific to the E2 glycoprotein of hepatitis C virus and their use in the diagnosis, treatment, and prevention of HIV. This invention is the subject of U.S. Patent Application 60/250,561. The territory for the prospective license is global, with the exception of Europe, India and Japan. The field of use may be limited to development of human monoclonal antibody biotherapeutics for the prevention and/or treatment of HCV infections.

• **NASA's Johnson Space Center** in Houston, Texas is considering granting a partially exclusive license to Stargate Research, Inc. (Denver, Colo.) for an androgynous, reconfigurable closed-loop feedback controlled, low impact docking system with load-sensing electromagnetic capture ring. The invention is the subject of U.S. Patent 6,354,540 and is NASA Case MSC-22931-1.

ORNL Ready to Compute

The Department of Energy's **Oak Ridge National Laboratory** (ORNL) has been chosen to lead a partnership with a goal of building the world's most powerful supercomputer by 2007, Energy Secretary Spencer Abraham announced today.

ORNL Director **Jeff Wadsworth** said the National Leadership Computing Facility (NLCF) proposal is a five-year plan that will pool the partnership's computational resources for a sustained capacity of 50 trillion calculations (teraflops) per second and a peak capacity of more than 250 trillion teraflops per second. "Our plans are to surpass the world's current fastest supercomputer, Japan's 40-teraflop Earth Simulator, within a year. The new machine will enable breakthrough discoveries in biology, fusion energy, climate prediction, nanoscience and many other fields," Wadsworth said.

Lab Work

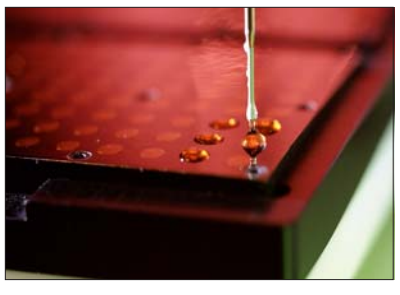
Berkeley Discovers Discovery

Until **Lawrence Berkeley National Laboratory** (LBNL) scientist Peter Schultz thought of a better way, materials discovery was a costly, slow, and laborious process.

In the early 1990s, Dr. Schultz and colleagues invented a super-efficient materials research process that combined miniaturizing with parallel processing.

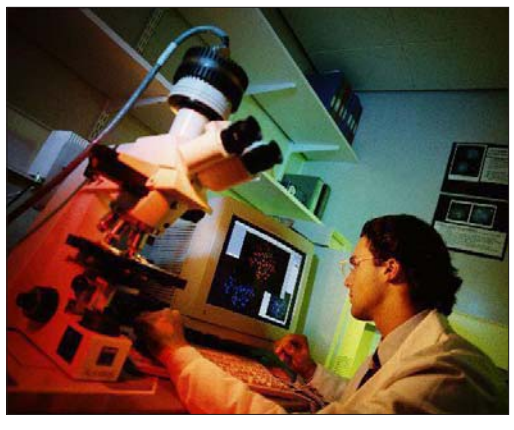
In 1994, the startup company Symyx Technologies, Inc., licensed the invention and began developing research tools that can create and screen new materials hundreds to thousands of times faster than traditional methods at a fraction of the cost.

Combinatorial techniques had been successfully applied in the pharmaceutical industry to discover new drugs when Schultz and coworkers in the Molecular Design Institute of LBNL proposed that the same approach could be extended to materials science. When searching for a new material, scientists define its desired properties and then decide which combinations of elements are most likely to yield those properties. Using automated devices to maximize speed, a library of 10,000 distinct materials can be placed onto a one-square-inch surface area. This library is subjected to varying environmental conditions, and tests are employed to screen for specific chemical and physical properties.



The LBNL concept is a radical improvement on traditional materials development, where compounds are created one at a time and painstakingly tested to search for desired qualities. Chemical catalysts, genomic probes, fuel cell components, and battery electrodes are just some of the materials that can be developed with this methodology.

Since 1994, when Symyx licensed the LBNL technology, the now profitable company has commercialized a polymer used for coating proteomics arrays and identified 12 new materials that are in development.



Symyx's Parallel DMTA™ measures various mechanical properties of an array of 96 thin solid films as a function of temperature and other environmental conditions.

In a collaborative effort with Dow Chemical, Symyx identified several new classes of catalysts to enable the production of novel high-value plastics and to reduce the cost of polymer manufacturing.

The company also entered into collaborative agreements with Merck & Co., Eli Lilly and Company, Exxonmobil Chemical Company, Rhodia S.A, Celanese, ICI, Unilever and others.

FLC NEWSLINK

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Tech Watch: Federal Laboratory Technologies Ready for Transfer

NREL's Hydrogen Energy

System for photobiological algal hydrogen production.

Hydrogen is the simplest and most abundant element in the world.

Hydrogen (H_2) can be produced from a wide variety of domestic resources using a number of different technologies. **The National Renewable Energy Laboratory** (NREL) has developed an exciting new technology that produces hydrogen from a renewable resource. Mutant algal hydrogenases is a new technology that produces hydrogen from renewable resources, the sun, and green algae. Overall mutant algal hydrogenases have achieved excellent results and demonstrate high market value through the use of inexpensive and abundant materials to produce hydrogen. However, currently there are performance limitations that research is focusing on improving—such as algal H_2 photoproduction is sensitive to O_2, a co-product of photosynthesis.

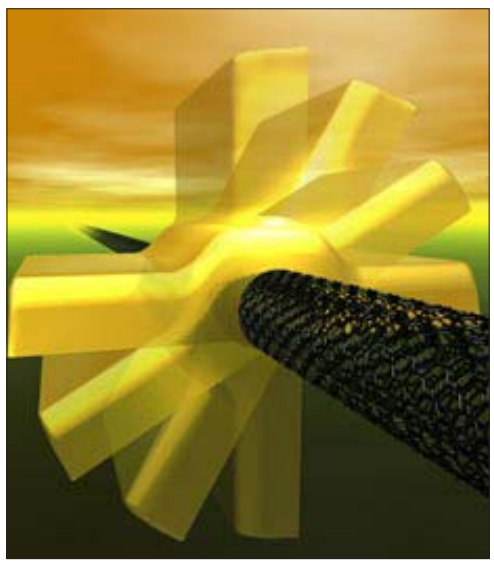
NREL is investigating ways to surmount this by focusing on genetically engineering the reversible [Fe]-hydrogenase (the enzyme that releases H_2 gas). This new innovative technology provides a strategic partner the opportunity to be the *first in line* to secure an inexpensive, easy to produce renewable energy resource that has the potential to play a major role in the hydrogen economy.

If you would like to explore collaborative opportunities with the NREL, please contact Richard Bolin, 303-275-3028 or at <Richard_bolin@nrel.gov>.

LBNL's Small Motor is Big Discovery

Lawrence Berkeley National Laboratory (LBNL) researchers have developed and tested the first nanometer-scale rotational motor.

The motor is the smallest synthetic motor ever created, smaller by three orders of magnitude than existing microelectromechnical (MEMS) motors. The nanomotor consists of a nanoscale electromechanical actuator that incorporates a rotatable metal plate, with a multi-walled carbon nanotube (MWCNT) serving as the key motion-enabling element, the motor shaft.



Simulation of nanomotor spinning on multi-walled carbon nanotube based on the first-ever nanoscale rotational motor.

The LBNL nanoelectromechanical systems (NEMS) actuator is designed to operate over a wide range of frequencies, temperatures (absolute zero to 600 °C), and environmental conditions, including high vacuum, radioactive, and harsh chemical environments.

It is expected to last longer than any other mechanical device due to the nearly frictionless movement of its parts.

Potential applications for the nanomotor are many, including any application that now uses a MEMS motor or sensor, such as automotive, electronic, and medical devices; biochemical applications; environmental detectors; microfluid systems; in optics serving as a mirror, with obvious relevance to ultra-high-density optical sweeping and switching devices; as oscillators found in wireless and microwave communication; and in computer information transmission and storage.

The nanomotor was built by depositing MWCNTs on the surface of a 4-mm-square silicon wafer and selecting individual tubes with an atomic force microscope.

A gold rotor, nanotube anchors, and opposing stators were then simultaneously patterned around the chosen nanotubes using electron beam lithography.

A third stator was placed under the silicon oxide surface. Low-level, externally applied voltages precisely control the operation speed and position of the rotor plate.

Extensively repeated oscillations of the rotor plate between positions 180° apart, as well as rotations of 360°, have been demonstrated with no signs of wear or fatigue.

The technology, for which there is a patent pending, is available for licensing.

More info: LBNL T² Dept., 510-486-06467 or <TTD@lbl.gov> FLC

Proven to Work

Livermore Fuels Clean Engine Technology

Transportation accounts for 65 percent of U.S. oil consumption.

More efficient vehicle engine designs would reduce U.S. dependence on foreign oil and help to mitigate global climate change caused by carbon dioxide emissions.

Cleaner engines would contribute to reducing toxic pollutants in the atmosphere, such as nitrogen oxide (NO_X), hydrocarbon (HC), and carbon monoxide (CO). One promising technology is called the homogeneous charge compression ignition (HCCI) engine.

LLNL engineers Francisco Espinosa-Loza and Daniel Flowers work on the stationary homogeneous charge compression ignition engine.

Lawrence Livermore National Laboratory (LLNL) engineers Salvador Aceves and Daniel Flowers are leading a team that is applying modeling processes originally developed by nuclear weapons researchers to study the HCCI engine's potential.

HCCI technology could be scaled to virtually every size and class of transportation engines, from small motorcycles to large ships. Stationary HCCI engines could replace the spark-ignited and diesel engines currently used for backup power generation and in businesses such as hotels, where recovered exhaust heat is used for swimming pools and other facilities. Caterpillar, Inc., has donated a six-cylinder stationary engine for the LLNL team to verify modeling results experimentally.

In the HCCI engine, fuel is homogeneously premixed with air, as in a spark-ignited engine, but with a high proportion of air to fuel. When the piston reaches its highest point, this lean fuel–air mixture autoignites (spontaneously combusts) from compression heating, as in a diesel engine.

A feature of the HCCI engine is that it burns cooler than spark-ignited and diesel engines.

Lower temperature combustion considerably reduces the emissions of NO_X. In addition, premixed combustion in HCCI engines reduces particulate matter emissions to very low levels.

An HCCI engine can operate using any fuel, so long as the fuel can be vaporized and mixed with air before ignition.

Although the advantages of the HCCI engine are clear, significant challenges must be overcome before the engine is commercially viable.

Once engineers resolve these issues, HCCI engines could achieve approximately 40 percent peak efficiency versus 30 percent for spark-ignited engines.

Diesel engines can achieve high efficiency similar to HCCI engines, but diesel engines are major sources of NO_X and particulate matter emissions.

Professors **Karl Hedrick**, **Robert Dibble**, and **J. Y. Chen** of the University of California at Berkeley are collaborating with LLNL researchers to address some of the engine combustion control challenges.

More info: Contact Salvador Aceves, 925-422-0864, <aceves6@llnl.gov>.

INEEL's Smart Card

Smart cards look and feel like simple credit cards, but they act like tiny computers. The Idaho National Engineering and Environmental Laboratory (INEEL) is using smart cards in a novel digital signature process developed for databases. A digital or electronic signature gives personal approval through computer and data lines rather than through signing a piece of paper with pen and ink. The U.S. government has enacted an electronic signature law that makes digital signatures legally acceptable.

Developed for managing and shipping nuclear waste, the INEEL digital signature represents one of the most complex digital signatures yet. The INEEL process allows a person to "sign" information that resides in hundreds of different locations on computer databases, unlike other digital signatures that sign only one file.

The compiled information is sent to a microprocessor chip on the smart card, where it is tightly compressed and encrypted to create the signature.

The information and the signature are inseparable. The INEEL electronic signature is made up of private and public keys that are created simultaneously with mathematical encryption formulas. The private key signs electronic documents, and the public key proves the signature's authenticity.

The private key stays in the smart card with the signer, and the public key is available wherever the signature needs to be verified. The cryptographic algorithms guarantee that each private key has one and only one public key. The "key pair" can be revoked or set to expire at any time, but if a private key is revoked and no longer valid, the public key will still recognize the historical signature.

More info: Contact Blair Myers, 208-526-2695 or <myerbj@inel.gov>

Industry and Wildlife, from page 1

- Assessing damage and other problems caused by wildlife to agriculture, the environment, and human health and safety
- Investigating the biology and behavior of problem animals
- Evaluating the impact of wildlife management practices on wildlife and the environment

Project examines ecology, behavior, and management of predators in relation to livestock, game animals, and threatened and endangered species.

- Developing and improving technology to reduce wildlife problems
- Supporting registration of chemicals and drugs used to manage wildlife and providing scientific consultation and specialized technical training
- Transferring scientific and technical information
- Providing scientific guidelines on wildlife damage for use by regulatory agencies
- Keeping abreast of latest technologies and their potential applications to wildlife damage
- Developing cooperative research and training with other organizations
- Addressing priority needs of user groups and the public.

Problems and Solutions

No wild animal is undesirable, yet almost any wild animal can damage crops, be hazardous to aviation, or become a threat to human safety.

Deer and smaller mammals can consume newly planted tree seedlings and other crops. Birds in large, high-density flocks can decimate grain and sunflower fields. Predators attack livestock and other domestic animals. Wild animals can spread diseases such as Lyme disease, rabies, plague, and histoplasmosis.

The Center evaluates damage situations and develops methods and tools to reduce or eliminate damage and resolve land-use conflicts. NWRC scientists study birds, mammalian predators, rodents, and other wildlife that cause serious but localized damage problems.

Through the publication of results and the exchange of technical information, the Center provides valuable data and expertise to the public and the scientific community, as well as to APHIS's Wildlife Services program.

History and Organization of the NWRC

The modern day NWRC originated as part of the USDA Bureau of Biological Survey (BBS) in the late 1800s.

The BBS Control Methods and the Food Habits Laboratories combined to form the Denver Wildlife Research Laboratory under the newly created Fish and Wildlife Service, Department of the Interior. 1986 saw another reorganization as Congress transferred the Denver Wildlife Research Center to the USDA's APHIS, Wildlife Services program. The Center employs more than 160 scientists, technicians, and support personnel at its Fort Collins headquarters and at field stations in several other states.

Today, NWRC is committed to:

- Being responsive to the concerns and values of the public.
- Providing valid, objective information of the highest quality.
- Promoting the welfare of animals and the quality of the environment.

Studies conducted at the NWRC will continue to provide new information needed to protect American agriculture from wildlife-related problems. These studies will help America manage its wildlife resources wisely and effectively into the future.

NASA Marshall, from page 1

ratory to something as large as a Solid Rocket Booster and determine alloy constituents to an accuracy of four decimal places is a major breakthrough," said Fred Schramm, technology utilization manager in MSFC's Technology Transfer Department. Schramm worked closely with Keymaster to develop the hand-held scanner.

The scanner also detects difficult-to-identify contaminants such as silicon, which can be detrimental to welding operations but which now can be identified and removed before the welding process begins.

Also, paint and other coatings won't adhere to surfaces if silicon is present. The scanner will provide on-the-spot identification to allow silicon removal before applying primer coating to hardware such as the Shuttle's solid rocket boosters.

The scanner development also marks a major improvement in the quality assurance field because screws, nuts, bolts, fasteners and other items can now be evaluated upon receipt and rejected if found to be substandard. The same holds true for aluminum weld rods.

"On-the-spot analysis to identify possible counterfeiting orotherwise unaccept-able parts at the distributor or process entry level will revolutionize the capability of NASA quality assurance and production operations to detect material problems at receiving inspection points, on the shop floor and in the field," said Schramm.

The Vacuum Enhanced X-ray Fluorescent Scanner

Three vacuum X-ray fluorescent hand-held scanners are already being used in the Space Shuttle program. The External Tank Project Office is using one for aluminum alloy analysis, while an MSFC contractor is evaluating alloys with another unit purchased for the Space Shuttle Main Engine Office.

The Reusable Solid Rocket Motor Project Office has obtained a scanner that is being used to test hardware and analyze materials.

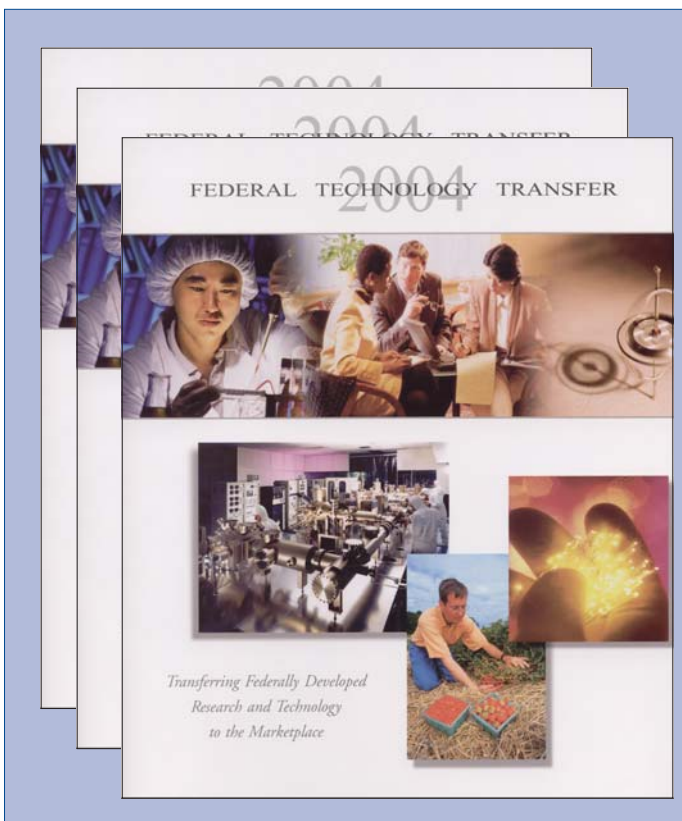
The product has potential for a broad application in other industries, especially those that depend heavily on materials analysis — such as the automotive and pharmaceutical industries. Materials can be scanned as they come in the door and faulty products rejected. Corrosion can even be detected through paint.

"The ability to validate the integrity of raw materials and partially finished products before adding value to them in the manufacturing process will be of benefit not only to businesses, but also to the consumer, who will have access to a higher value product at a cheaper price," Schramm said.

KeyMaster's work in developing the scanner technology with NASA was enabled by the agency's Technology Transfer Program and resulted in an exclusive license.

For more information on KeyMaster, contact John Landefeld, 509-783-9850.

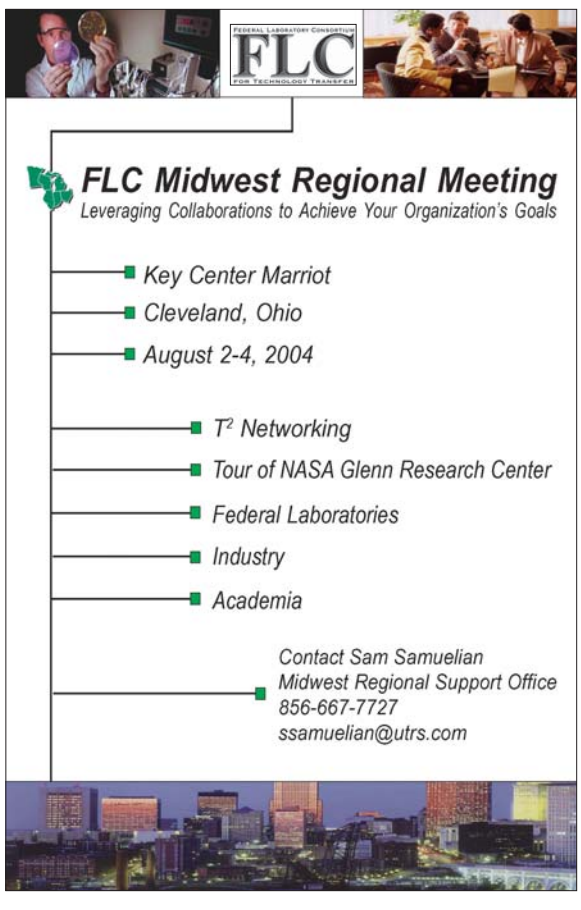
For more information about licensing agreements with NASA, contact **Sammy Nabors**, 256-544-5226.



2004 Federal Technology Transfer

From exotic medical equipment to items filling supermarket shelves, *Federal Technology Transfer 2004* highlights and describes successful technology transfers having their genesis in the federal laboratory system. Being of high potential impact and human interest, the technologies listed in this publication have completed their transition from research to results via the technology transfer process.

To order your copy, contact the FLC MSO at 856-667-7727



FLC Debuts Training Resources Database

The online Technology Transfer Training Resources Database (T^2 TRDB) was featured at the FLC's exhibit during the 30th annual meeting of the Association of University Technology Managers (AUTM), March 3-6, 2004, in San Antonio, Texas.

T^2 TRDB leaders Kevin Permenter (left) and Kelvin Willoughby discuss their initiatives at the annual FLC National Meeting in San Diego, Calif, May 6, 2004.

The database, which now contains 200 entries, lists training opportunities pertinent to the needs of T^2 professionals in the federal, public, and private sectors.

The AUTM conference was attended by 1800 people. Visitors to the FLC booth included university, government, and private sector T^2 professionals.

Questions focused on how to access the courses described in the database, how to contribute additional courses and, most important from the overall FLC perspective, how to access federal laboratory technologies.

You can access the T^2 TRDB through <www.federallabs.org> by clicking on the Education & Training graphic and then clicking on "Enter the Technology Transfer Training Resource Database," or through <www.westminstercollege.edu/flc>. FLC

Kirtland Educational Initiatives for Techies

by Joan Miller, FLC Education and Training Committee

Articles about the FLC's education and training activities so far this year have focused on the needs of and services for the FLC constituency. This article describes two unique new educational efforts underway at Kirtland Air Force Base to help assure U.S. prowess in technology development and management for decades to come. Hopefully, some of the primary and secondary school student participants in these programs will become our technology transfer personnel of the future.

The first initiative is STARBASE La Luz (The Light) Academy. Launched March 15 by New Mexico Congresswoman Heather Wilson, the program will provide Albuquerque students with extracurricular mathematics and science coursework in a hands-on research setting palatable to young people who might otherwise resist or avoid these subjects. The curriculum is divided into three "flights" designed to inspire students and yet be relevant to Air Force needs. Scientists at the Phillips Research Site mentor students and oversee the technology projects. The flights include SPACE: Students Planning and Conducting Engineering; PETES: Providing Engineering and Technology Experiences for Students; and Mars Missions: Cosmic Village, in which students build a habitat prototype of a colony on Mars. The key goal is to instill excitement and appreciation for math, science, and engineering technology AND an understanding that mastering these studies opens the doors to exciting defense careers and the fulfillment of dreams!

President Dan Lopez, New Mexico Institute of Mining and Technology, and AFRL/DE Director Dr. Bruce Simpson look on as Congresswoman Heather Wilson (R-NM) assists students at STARBASE.

A second effort underway is development of the Phillips Technology Institute, a multidisciplinary think tank from which to orchestrate and deliver future war fighter technologies. A Partnership Intermediary Agreement (PIA) signed March 15, 2004, with the New Mexico Institute of Mining and Technology (New Mexico Tech) will start the program, with other universities slated to join as the plan evolves. World-class researchers will join together through this Institute to explore new ways to conduct business that will transform how technology for defense and homeland security reaches the end user. The Institute is envisioned as an open operating environment to provoke the imagination and invoke few limitations on the workforce – a "skunk works" of sorts, where "inside the box" thinking will be the exception rather than the rule.

For detailed information, contact John Brownlee, AFRL, Kirtland AFB, Albuquerque, at 505-846-4704.

MOMENTS FROM THE FLC NATIONAL MEETING • *MISSION DRIVEN PARTNERSHIPS* • MAY 3-6, 2004 • SAN DIEGO, CALIFORNIA

For more FLC meeting news and highlights, visit *www.federallabs.org*

DC on T^2, from page 1

future budgetary priorities for FY05 to FY09.

These outyear projections suggest that the Bush Administration would cut R&D funding for all but three—DOD, DHS and NASA—of the 24 federal agencies over the next five years, with the deepest cuts occurring in FY06.

In addition to Koizumi's thought-provoking budget analysis and forecast, delegates heard several interesting presentations by Senate Minority Leader Tom Daschle (D-SD), public opinion survey pioneer Daniel Yankelovich, UK science and technology (S&T) policy professor Luke Georghiou, and Council on Competitiveness president Deborah Wince-Smith.

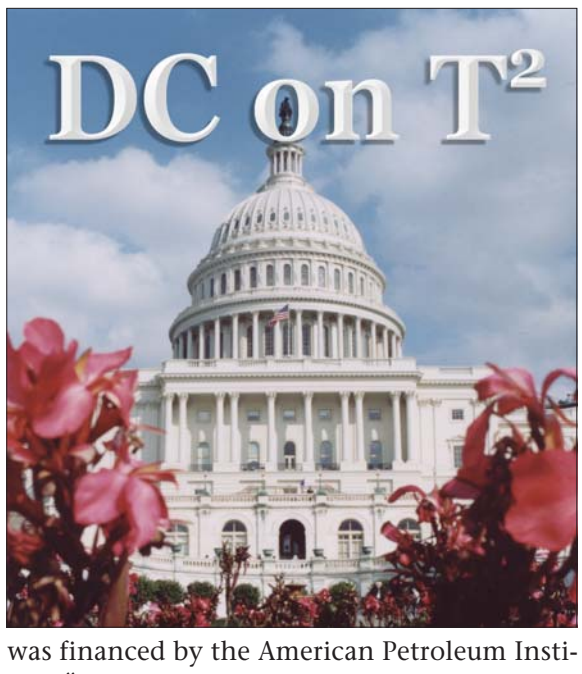
In a speech peppered with references to the Founding Fathers, Merriwether Lewis, and contributions made by S&T to the nation's economy and security, Sen. Daschle cast some stones at the Bush Administration's S&T record.

"The administration is abdicating its responsibility to provide scientists with the funding [that] cutting-edge research demands," he said.

"The federal government has seen its R&D investments steadily decline as a share of the U.S. economy, bringing the federal investment down to levels not seen since the mid-60s."

Sen. Daschle also referred to claims made in a recent Union of Concerned Scientists' report.

"Consider the administration's response to global warming. Even though the scientific community is united on the fact that fossil fuel production and consumption has contributed to global warming, the White House deleted that finding from its 2001 report ... and in its place inserted a reference to an opposing study that



was financed by the American Petroleum Institute."

"When the administration has had the opportunity, it's stacked the decks by staffing research boards and advisory councils with underqualified researchers, who have shown allegiance to the White House political goals," Sen. Daschle said.

"This isn't real science," he said. "It's vending machine science. The administration thinks it can pull a lever and get the results it wants at no cost.

"But the costs are extraordinary. If history shows anything, it's that a bet against science is a bet you can't win. For the sake of short-term political posturing, the White House is putting the longterm security, health and prosperity of our nation at risk."

Koizumi's analysis shows that Bush plans would:

- *Increase federal support for R&D from $126.5 billion this year to $141.6 billion in FY09, a 3% hike after adjustment for inflation, but these increases would be concentrated in defense, homeland security and space programs. All other R&D programs would see their funding decrease over the next five years, with the modest FY05 increases reversed in FY06 and remaining below their currents levels after that.*
- *Nine of the 12 largest R&D funding agencies would see their budgets fall in real terms in the Bush budget plans, with only DOD, DHS and NASA staying ahead of inflation.*
- *Nondefense R&D would rise from $56 billion this year to $60.5 billion by FY09, a 0.5% increase after adjustment for inflation. Excluding increases for DHS and NASA, the remaining nondefense R&D portfolio would decline 6.7% in the same period.*

For more details of Koizumi's analysis, go to <www.aaas.org/spp/rd>. FLC

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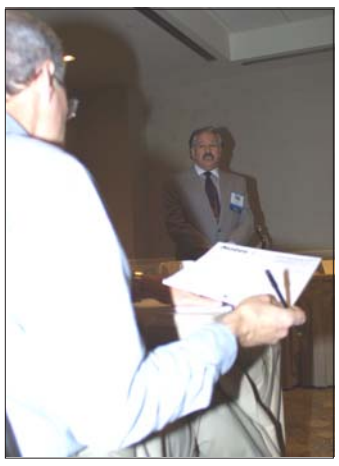
the group as he discussed methods to obtain direct investment capital and market placement.

Guy's biggest piece of advice, "Always ask a woman if your idea is a good one," was just one of many highlights in a session that covered everything from Microsoft *PowerPoint™* slide font size to working with Steve Jobs.



An FLC meeting attendee takes notes while listening to negotiating expert Jesse Erlich.

Also held on Tuesday was *Interagency Perspectives*, which was moderated by Cynthia Gonsalves of the Office of the Secretary of Defense.

Cynthia's panel informed an attentive audience how to manage the differences and similarities associated with various agency T² programs.

Other Tuesday highlights included *T² Outreach: Spotlight on Regional Successes with State and Local Government* led by Susan Sprake of Los Alamos National Laboratory; Richard Brenner's *New Challenges to the T² Process: Creative Solutions;* and *What the FLC Does for Membership* led by FLC Chair Ed Linsenmeyer.

On Wednesday, attendees were treated to an interactive session on *Intellectual Property* led by Tom Lange of Procter and Gamble, followed by Jonathan Root of NASA T² moderating a panel discussion on *Software T² Issues: Policy, Strategy, and Tools*.

Cynthia Gonsalves of the Office of the Secretary of Defense discusses interagency perspectives.

Wednesday's Industry and Lab Directors Forum was a hit with attendees as they enjoyed a practical discussion of perspectives on fostering collaborative partnerships.

Wednesday was capped off with the much anticipated FLC awards ceremony and dinner held at the San Diego Museum of Natural History. The evening, which honors outstanding achievements in technology transfer, will be fully detailed in the upcoming *FLC NewsLink* awards issue.

Although the meeting would wrap up on Thursday night, the pace didn't slow at all during the day. A panel of experts led by FLC Washington, DC Representative **Dave Appler** presented issues and solutions associated with venture capital for startups, while TPWG Chair **Cheryl Cejka** led a discussion on "one of the biggest challenges to technology commercialization, bridging the valley of death."

Attendees discuss an award-winning technology during the Fulfilling the Mission *poster session.*

Hans Kohler of the Naval Air Warfare Center offered attendees information on the innovative use of "nontraditional" T² mechanisms, and FLC Awards Chair **Vic Chavez** offered a class on *Writing Successful Award Nominations*.

As session attendees left the conference with their many new T² tools and ideas, FLC Program Chair **Sharon Borland** was already developing the 2005 meeting in Orlando, Fla. Stay tuned!

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