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T² F A C T

Englishman Sir Henry Bessemer (1813-1898) invented the first process for mass-producing steel inexpensively. An American, William Kelly, had held a patent for a method of steel production known as the pneumatic process whereby air is blown through molten iron to remove unwanted impurities. Bankruptcy forced Kelly to sell his patent to Bessemer. Bessemer patented "a decarbonization process, utilizing a blast of air" in 1855.

-Mary Ellis, About.com



T² E V E N T S

FLC National Meeting
Mission Driven Partnerships
Orlando, Fla.
May 1-6, 2005

NSTI Nanotech Conference
and Trade Show
Anaheim, Calif.
May 8-12, 2005

American Society of Naval
Engineers and NAVSEA
Philadelphia's Intelligent
Ship and Intelligent
Technology Symposium
Philadelphia, Pa.
June 1-2, 2005

North Texas SBDC
SBIR Conference
Dallas, Texas
June 7, 2005

2005 Technology Transfer
Society Meeting
Kansas City, Mo.
Sept. 28-30, 2005

Academic Science Buildings
St Petersburg, Fla.
October 24-25, 2005

INL's SCIENCE AND ENGINEERING EXPO DRAWS THOUSANDS

by Elda D. Zoumar, Ph.D.,
Idaho National Laboratory

Idaho National Laboratory (INL) held its fourth annual Science and Engineering Expo in Idaho Falls, Idaho, last September, proving that the next generation of innovators is eager to take the torch.

With a spotlight on energy and power, the Expo showcased 70 different indoor and outdoor exhibits, simulations and interactive demonstrations, experiments, hands-on activities, and presentations in the physical sciences, environmental sciences, life sciences, earth and space sciences, and technologies of all kinds.

Technology areas included auroras and atoms, electricity and engineering, petroleum and propane, and water and wind power.

Alternatively powered vehicles included

peer through sun spotters and telescopes; they stood five-deep to "see" heat via an infrared camera; and they mobbed the NASA exhibits to find out about space exploration.

In four years, the Expo has grown from a one-day event to a three-day extravaganza at the Museum of Idaho, reaching thousands of students, teachers, and parents in eastern Idaho and bordering states.

Through the Expo, INL partners with other national laboratories, invited businesses and industries, professional societies, and universities to interact with visitors in this massive community and educational outreach effort.



The Electric Blue Formula Lightning race car from Brigham Young University, shown here on the Bonneville Salt Flats in Utah, led the array of exhibits at the fourth annual INL Science and Engineering Expo.

cars powered by electricity, hydrogen, biodiesel and natural gas; a glider dependent on wind currents; a 70-foot-tall propane-heated balloon; unmanned aerial helicopter and fixed-wing vehicles; and remotely controlled robotics. Students lined up to

technology appears to be madness but, the kids love it!

Attendance numbers have grown from 2,500 visitors in 2000 to 10,000 visitors in 2004. The students who attended the

See INL's Expo, page 4

NTTC's ROLE IN W. VA. HEALTH

by Neil MacDonald
Federal Technology Watch

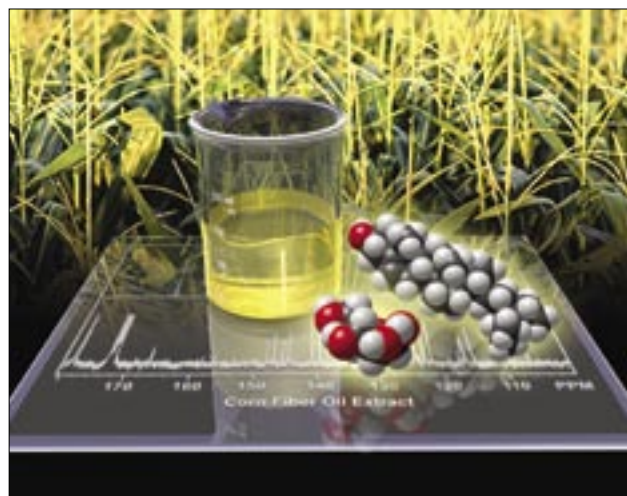
A nationally accredited military health program using some of the latest technology is to be adapted to meet the needs of West Virginia's underserved rural patients. "For far too long, rural health care has meant inferior health care," said Sen. Robert Byrd, D-WVa. "That's unacceptable.

Programs such as HEALTHeWV allow patients in rural areas to take a far more active role in their care which, in turn, helps to further the goal of health care equality."

HEALTHeWV will use information technology from Walter Reed Army Medical Center's award-winning HEALTHeFORCES program for a disease outcomes management and preventive health services initiative to improve health care quality, cut costs

See NTTC's Role in Health Care, page 5

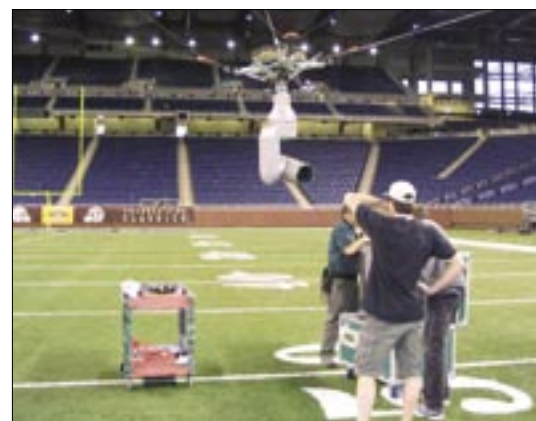
PNNL BIOMASS TECH IMPROVES PLASTICS



Researchers at Pacific Northwest National Laboratory are working to develop an economic process for the separation of corn fiber into its core building blocks.

The Iowa Corn Promotion Board (ICPB) has signed its first commercial license with UT-Battelle to produce a new plastic additive made from corn that offers a variety of commercial advantages. Battelle operates the Department of Energy's (DOE) Pacific Northwest National

AFRL's PRECISION GIMBAL HELPS NFL AND ACADEMY AWARDS



System installation of the gimbal technology at Detroit's Ford Field, Thanksgiving Day 2004.

Sequoia Technologies, an Albuquerque small business, has developed advanced isolation and control technologies under Phase I Small Business Innovation Research (SBIR) contracts in partnership with the Air Force Research Laboratory, Space Vehicles Directorate (AFRL/VS) and the Missile Defense Agency (MDA/AL and MDA/SS).

The exciting potential of this new technology was recently proven through successful technology transition to industry, despite the resource limitations of a Phase I contract.

The gimbal technology was used for the first time on Thanksgiving Day as a camera mount in an NFL football game on Thanksgiving Day 2004 at Ford Field in Detroit.

The gimbal with camera is suspended over the field via cables, which are retracted or extended to reposition the gimbal anywhere over the field. Remote operators use the system to guide the camera to viewing angles not achievable using traditional camera locations.

The Sequoia stabilization technology built into the gimbal enables the camera to film and track the action while in motion, unimpeded by vibration.

These cool shots placed the viewer right in the middle of the action as Peyton Manning led the Colts to a 41-9 drubbing of the hapless Lions.

See AFRL Helps NFL, page 4

Laboratory (PNNL) based in Richland, Wash., where the research will occur.

The compound, isosorbide, can be used to improve the properties of plastic materials such as bottles. Research has shown that the corn-based isosorbide will make these plastic bottles more rigid and stronger than regular plastic bottles. The preliminary cost estimates show that isosorbide from this technology is competitive with petroleum-based building blocks used to make plastics.

Commercializing this product will provide benefits to the consumer and the grower. "The use of renewable corn derived isosorbide will reduce the amount of petroleum necessary to make plastics. Incorporating isosorbide into plastic will improve the properties of the plastic and reduce our dependence on foreign oil," said PNNL Program Manager for Bioproducts Todd Werpy.

ICPB entered into a Cooperative Research and Development Agreement (CRADA) See PNNL's Biomass Tech, page 4

FED LABS FLASH | TECHNOLOGY TRANSFER NOTES

LBNL STARTUP ACQUIRED FOR \$270 MILLION

Lawrence Berkeley National Laboratory (LBNL) has announced that its startup company, Syrrx, Inc., will be acquired by Takeda.

Takeda, a major pharmaceutical company, is planning to purchase the San Diego-based biotechnology company to use the structural proteomics for drug discovery developed at LBNL.

This acquisition, amounting to \$270 million, will enable Takeda of Japan to add new drug discovery operations in the diabetes and oncology areas.

Founded in 1999, Syrrx currently has 91 employees and several products treating diabetes and cancer that are in preclinical and early clinical research. Using x-ray crystallography to determine the structure of molecules a drug might target, scientists at Syrrx have been able to design more effective drugs that bind more tightly with the target.

For more information, visit www.signonsandiego.com/uniontrib/20050208/news_1b8syrrx.html.

PNNL RANKED IN TOP 100 TRAINING ORGANIZATIONS

In recognition of its excellence in staff development and management practices, the Department of Energy's Pacific Northwest National Laboratory (PNNL) has received a 2005 Training Top 100 Award from *Training* magazine.

PNNL placed 23rd on the list of 100 outstanding organizations, joining firms like IBM, Pfizer, Inc., and Sprint Corp. as the nation's top training leaders.

Training magazine's annual award recognizes 100 outstanding training programs from organizations in a variety of industries, ranging from manufacturing to insurance and banking to government. This is the second consecutive year that PNNL has been acknowledged for exceptional training practices.

"We are extremely honored to receive this award," said PNNL Director Len Peters. "This recognition acknowledges that we are providing our staff with

tools that will enhance their workplace experience and strengthen our ability to deliver outstanding science and technology."

PNNL's training programs have resulted in significant savings at the laboratory, including an estimated \$5.5 million in recruiting, hiring and relocation costs in the last five years as a result of the laboratory's management skills development program.

The retention rate for managers who have participated in this program is 300% higher than the average retention rate at PNNL.

"Our approach to maintaining a healthy work environment is based on the premise that highly engaged staff will drive innovation and move the organization toward higher levels of scientific creativity, productivity and workplace safety," said Paula Linnen, vice president and director, PNNL Human Resources.

Training magazine (www.trainingmag.com) is a 40-year old professional development magazine that advocates training and workforce development as a business tool.



Len Peters

USDA HELPS FISH CROSS THE ROAD

The redesign of culverts to allow fish passage is often the top priority action for fisheries restoration.

Joint research by the USDA Forest Service Pacific Northwest Research Station and the San Dimas Technology and Development Center has resulted in software that greatly eases the redesign process.

The FishXing (pronounced "fish crossing") software is a tool for designing fish-passable culvert replacements, and it can be downloaded for free from the Internet at <http://stream.fs.fed.us/fishxing>

The software is used throughout the United States and in Canada, Taiwan, and many European countries, saving time and money.

NREL UNVEILS IP DATABASE OF TECHS

The National Renewable Energy Laboratory's (NREL) Technology Transfer Office has just unveiled its new, easy-to-use, online intellectual property database that contains all NREL-developed technologies (patents, copyrights, and trademarks) that are available for licensing.

The database provides visitors with options to browse NREL's intellectual property by technology or to search by keyword, patent or trademark number, or inventor.

This database directly supports a critical part of the NREL's mission—to transfer knowledge and innovations to address the nation's energy and environmental goals.

Contact Richard Bolin at 303-275-3028 to learn more about licensing NREL technologies.

APL HONORS PPPL SCIENTISTS

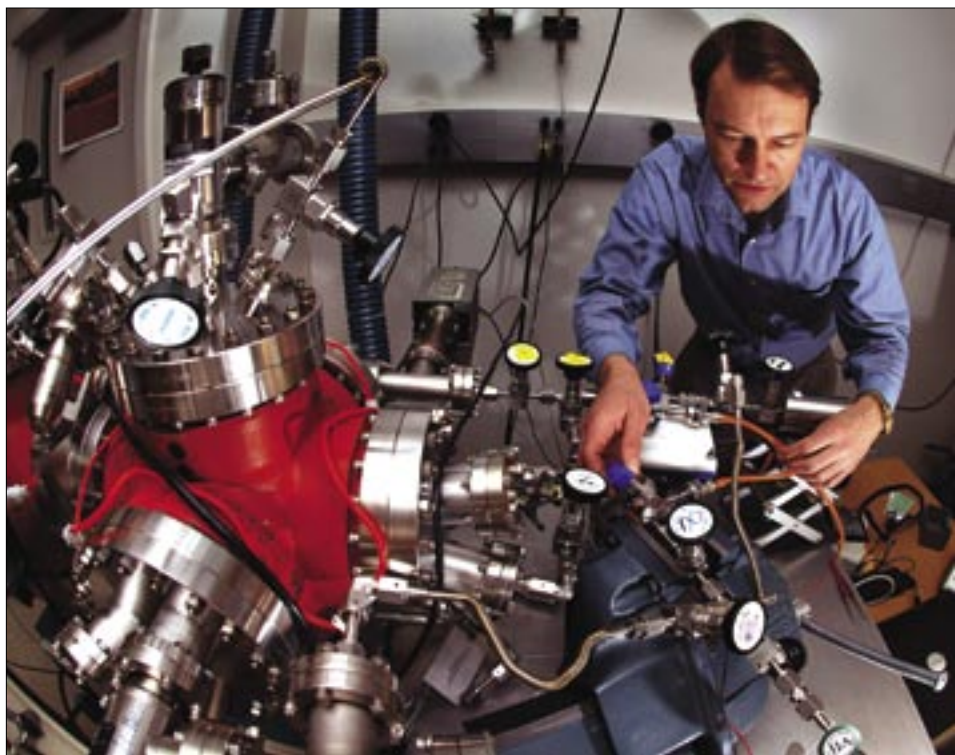
The American Physical Society (APS) recently honored three scientists at the U.S. Department of Energy's Princeton Plasma Physics Laboratory (PPPL).

PPPL's Chio Z. "Frank" Cheng and King-Lap Wong received the APS 2004 Award for Excellence in Plasma Physics Research, and Hantao Ji was named an APS Fellow. APS officials announced the honorees during the society's Division of Plasma Physics annual meeting in Savannah, Ga.

Cheng and Wong were among five scientists to receive the Excellence in Plasma Physics Research Award in recognition of work related to the confinement of energetic alpha particles, which is important to fusion energy research.

More info: www.aps.org/praw/plasma/index.cfm

SANDIA GAS SAMPLING DEVICE RAPIDLY DETERMINES WHETHER MEMS SEALS ARE EFFECTIVE



Sandia National Laboratories researcher Steve Thornberg arranges picopuffs of gases from crushed MEMS devices to be sampled by his group's unique analytic device.

Just as astronomers want to understand the atmospheres of planets and moons, so engineers want atmospheric knowledge of worlds they create that are the size of pinheads, their "skies" capped by tiny glass bubbles.

Should their silicon inhabitants — microcircuits, microgears, and micropower drivers — exist in a vacuum? An atmosphere of nitrogen? Air as we know it? More importantly, whatever atmosphere was intended, how long will it stay that way? Is the protective barrier hermetic or will its atmosphere change over time, potentially leading to the early death of the

device? Will water vapor seep in, its sticky molecules causing unpredictable behavior? What, in short, can we say about how long this little world and its inhabitants will survive and function?

The most advanced sampling procedure known — requiring only picoliters of gas to evaluate the contents of these small atmospheres — is now in place at Sandia National Laboratories (SNL), a National Nuclear Security Administration facility. The method was recently revealed at the SPIE Photonics Meeting in San Jose, Calif.

"I know of no one, anywhere else, who can do this kind of testing," said Sandia innovator Steve Thornberg.

John Maciel agreed. Chief Operating Officer of Radant MEMS, a three-year-old startup company in Stow, Mass., he is under contract with DARPA

(Defense Advanced Research Projects Agency) to develop high-reliability MEMS (microelectromechanical) switches for microwave devices and phased array antennas. He also sees markets for his MEMS switches in cell phones.

The SNL method — funded by its Laboratory-Directed Research and Development program, and presented for consideration to SNL's patent office — involves a small commercial valve that comes down like a trash compactor and crushes a tiny device until it releases its gases — currently, about 30 nanoliters — into

See Sandia's Gas Sampling Device, page 6

FLC NEWSLINK

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TECH WATCH | LABORATORY TECHS READY FOR TRANSFER

STRONG RUBBER

Agricultural Research Service (ARS) scientists discovered a method using defatted soy products to improve the strength of rubber products.

The aqueous dispersion of defatted soy products is mixed with the aqueous dispersion of polymers under specific conditions to form a master batch. The dried composite is then compounded with rubber chemicals and compressed-molded to form various objects using conventional methods.

The method can be used in various industries such as rubber, plastic, and coatings to significantly improve the strength and biodegradability of a variety of polymer products.

Various organic and inorganic fillers, such as carbon black, have been used to reinforce polymer materials. The advantage of using this technology versus other conventional fillers is that defatted soy products give a higher reinforcement effect in rubbers at a comparative, or lower, cost.

The technology provides a high performance and low-cost alternative to petroleum-based carbon black and other inorganic fillers. It also improves the biodegradability of crosslinked rubbers that are known to be difficult to recycle or dispose.

The project leader in the development of this new technology is Dr. Lei Jong of the Cereal Products and Food Science Research Unit (CPF) located at the USDA, Agricultural Research Service, National Center for Agricultural Utilization Research Center in Peoria, Ill.

CPF research is targeted toward the development of new value-added products via processing methods that will enhance the performance of agricultural materials in existing applications, or develop new applications for agriculturally based biopolymers.

More info: Dr. Lei Jong, 309-681-6240, jongl@ncaur.usda.gov

LIVERMORE SEEKS LICENSEE FOR VISION EVALUATION SYSTEM

Lawrence Livermore National Laboratory (LLNL), operated by the University of California under contract with the U.S. Department of Energy (DOE), is seeking a company to license and commercialize a MEMS-based Adaptive Optics Phoropter (MAOP), which is a system for vision evaluation and correction.

This MAOP system has recently received the R&D 100 Award for one of the 100 best new inventions in 2002.

Traditional phoropters can only correct for lower order aberrations (defocus and astigmatism). Unlike traditional phoropters, the MAOP system can diagnose and correct for lower and higher order (such as spherical aberrations, coma, etc.) aberrations.

Higher order aberrations have been clinically shown to increase with an individual's age and affect factors such as contrast sensitivity. Correcting for higher order aberrations has been shown to be beneficial for patients undergoing laser eye surgery and for those suffering with extremely poor vision.

Modules are currently being constructed that would enable the system to also perform retinal imaging.

Enhanced retinal imaging would be useful in the diagnosis and treatment of retinal diseases such as retinitis pigmentosa, glaucoma, diabetic retinopathy, and macular degeneration.

The MAOP is intended to replace the standard phoropter commonly used today by ophthalmologists and optometrists. Patients will have nearly the same experience as they have today. They will view a visual scene (e.g., an eye chart) through a viewport and then be asked to comment on whether the scene ap-

pears clearer (a subjective response). The clinicians' experience will also be similar, except they will not need to perform many of the manual steps required with standard phoropters. However, in contrast, the results of the MAOP system will be significantly improved and more precise than today's outcomes.

Visual acuity is degraded by aberrations in the cornea and lens of the eye. These aberrations distort the wavefront of the reflected light.

The MAOP system is based on the use of adaptive optics to compensate for these aberrations and correct the wavefront.

The wavefront corrector (MEMS-based deformable mirror) applies the appropriate correction, automatically calculated by the wavefront sensor (Hartmann Shack type).

This objective information will then be combined with the subjective response from the patient so the clinician and patient can attain the best correction and

compensate for high-order aberrations.

The resulting wavefront information can then be used to specify an individualized prescription for custom contact lenses or custom laser eye surgery.

More info: www.llnl.gov

LANL'S NEW POLYMER PRODUCTION METHOD

Los Alamos National Laboratory (LANL) inventors have come up with a new method to produce conducting polymers from polyaniline.

Existing techniques produce a powdered polymer from polyaniline.

The technology produces 30 to 40nm-width fibers using a simple, environmentally friendly (made in water) chemical reaction. The fibers are highly chiral (highest for a synthetic polymer and as high as in proteins), can conduct electricity, and can be produced to be very small nano-fibers.

The invention, available exclusively, has a number of potential applications, including separation of L and D forms of drug enantiomers in the pharmaceutical industry, electrode coating and electrolysis, biosensors, and clothing.

This invention is part of a portfolio of conducting polymer technologies that are available for licensing at LANL.

More info: Allen Morris, Technology Transfer Division, Los Alamos National Laboratory, P.O. Box 1663, MailStop C334, 505-665-9597, tamorris@lanl.gov



LLNL members of the MAOP team (left to right): Scot Olivier, Steve Jones, Kevin O'Brien, Don Gavel, Abdul Awwal, and Brian Bauman.

FLC 2005

Federal Laboratory Consortium for Technology Transfer



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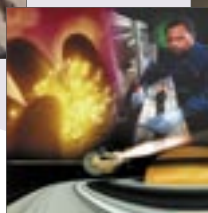
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PNNL's Biomass Tech, from page 1

with PNNL to develop this process for converting corn into isosorbide. ICPB funded its tasks under the CRADA with Iowa corn check-off investment funds, while PNNL's tasks were funded by the DOE through the Office of Energy Efficiency and Renewable Energy. "The grower will benefit by creating new uses for corn and new jobs for rural economies. Isosorbide could consume another 30 to 40 million bushels of corn annually," said ICPB Director of Research and Regulatory Affairs Rod Williamson.

"We have made a commitment to developing cost-effective processes for obtaining high-value chemicals from biomass," said Werpy. "The key is to make a low-cost product that will compete in a petroleum-based

plastic market. This license is one of several pieces of technology that are necessary to make this a commercial success. The next step is to sublicense the new technology," added Williamson.

The Iowa Corn Promotion Board, a 17-member board of farmer-elected corn growers, directs the investment of Iowa corn checkoff funds in market development, education and research projects. PNNL (www.pnl.gov) is a DOE Office of Science laboratory that solves complex problems in energy, national security, the environment, and life sciences by advancing the understanding of physics, chemistry, biology and computation.

PNNL employs more than 4,000, has a \$650-million annual budget, and has been managed by Ohio-based Battelle since the lab's inception in 1965.



37 Model Technology
Assessment and Partnership
Opportunities

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INEEL's Expo, from page 1

Expo represented a 104 schools: 95 public schools from a three-state area, 6 private schools, and 3 charter schools.

Numerous home school organizations, including the Idaho Leadership Academy and Teton Valley Home Educators, complemented by schooled students at home, very young students enrolled in preschools, and representation from Options, Inc., contributed to the population of students in attendance.

The two ages and grades of highest impact were 10 and 11 years old, and the fifth and sixth grades.

The Expo program is intended to augment the traditional science curriculum taught in K-12 schools. Therefore, the technologies at the Expo are associated with a science, as much as possible, and science activities are linked to national science education content standards and correlated Idaho state achievement strands.

Historically, students have tended to rate the hands-on technology activities higher than they have the basic science activities, with the exception of chemistry. Given this observation over the four years of the Expo for this grade range, the



Students representing 95 public schools, 6 private schools, 3 charter schools, and several home school organizations enjoyed the science behind the products during INEEL's Science and Engineering Expo.

incorporation of technology standards into the 2005 Expo program of activities will be explored.

Although the Expo is geared toward students in grades five through nine, the Expo is not age-discriminatory.

It promotes equal access to information across ethnic populations and between genders.

It is free to the public, making it accessible to all economic groups.

For this reason, the Expo program of activities is designed with the young and old, and the very technical and lay person in mind. There is something for everyone—from air and space to astronomy, biological sciences, ecology, physics, nuclear energy, fire science, national security, and more.

Comments from attendees included "Awesome! And you learn a lot about science" (female, age 13, grade

8); "This is the only real science we get exposed to. Keep it up" (teacher, grade 5); "Excellent! We have loved it for two years. We wouldn't miss it" (parent).

For more information, contact Elda D. Zounar at <zouned@inel.gov> or 208-526-4491, or visit <www.inel.gov/techtransfer/expo>.

AFRL Helps NFL, from page 1

Two suspended camera systems have now been fielded and are in regular use.

The gimbal "credits" so far include six NFL telecasts on CBS, including all of the 2005 playoffs, the 2005 NBA All-Star Game on TNT and, most recently, the 2005 Academy Awards on ABC. The photo shows Sequoia's new HDTV composite gimbal in



Sequoia's new HDTV composite gimbal in action as Clint Eastwood accepts the Oscar for "Best Director" award from Julia Roberts at the 2005 Academy Awards.

action as Clint Eastwood accepted the Oscar for "Best Director" from Julia Roberts.

The various technology advances enabled by the SBIR program were combined to provide the composite structure, drive technology, control systems, and electronics needed to develop an advanced gimbal product for commercial use.

The lighter, more compact design provides higher performance at a lower cost than any competitive products on the market. The system is capable of stabilizing a 2 megapixel high definition

developed by Sequoia.

The goals of the MDA- and AFRL-funded efforts were to develop a torque actuation and sensing system (TASS), with applicability to the AFRL Cygnus Flight Experiment, as well as the airborne laser (ABL) and STSS programs.

Onboard Cygnus, TASS will be used to diagnose, isolate and excite the low-frequency PowerSail solar array structure.

The TASS system provides high-performance stabilization in the presence of base disturbanc-

camera with telephoto capabilities on a suspended cable system at speeds in excess of 30 mph.

All processing is integrated with the gimbal and operated remotely through a fiber optic link from a remote control unit also

es. This requires significant technology advances in the use of remote interfaces for all functions, on-board processing, and thermal and environmental protection.

The Sequoia Phase I SBIR efforts established the feasibility of the technical approach. The remote interface communications and lessons learned from off-axis drives used in the NFL camera systems play directly into the TASS design for on-orbit demonstration on Cygnus.

Sequoia is also in discussions with MDA and Raytheon about other space applications.

Sequoia has also been selected for an Air Force Phase II SBIR, which will further develop the off-axis drive technology used for the gimbal roll axis for application as a vibration suppression actuator for AFRL/VS's Cygnus Flight Experiment.

It will be a key component in a series of system identification and controls experiments planned for the spacecraft.

A Phase II SBIR proposal is also pending with MDA that, if selected, would demonstrate a more advanced gimbal system with significant performance improvements that could be applied to a variety of operational applications.

More info: Contact Mary Archuleta, Air Force Research Laboratory Technology Transfer Office, 505-846-8056, mary.archuleta@kirtland.af.mil, or visit the AFRL website at <www.afrl.gov>

Entrepreneurs to Learn How to Tap Into a Billion Dollar Business Resource at the 2005 SBIR Conference

Entrepreneurs, scientists, researchers, engineers and small business owners throughout the Southwest and beyond will have the opportunity to learn how to apply for government grants of more than \$1.5 billion for conducting research and development.

To increase the opportunities for securing these funds, the North Texas Small Business Development Center is hosting the 2005 Small Business Innovation Research (SBIR) Conference.



Dallas, Texas
June 7, 2005

More info: James Berish, 214-860-5709

www.ntsfdc.org/sbir.htm

The Small Business Development Center program listed herein is a joint effort of the U.S. Small Business Administration and the Dallas County Community Colleges. They are partially funded by the North Texas SBDC under Cooperative Agreement 5-603001-Z-0046-19 by the U.S. Small Business Administration, though such funding does not constitute an expressed or implied endorsement of any of the co-sponsors' or participants' opinions, findings conclusions, recommendations, products or services

FLC MID-CONTINENT PARTICIPATES IN WILDLAND FIRE 2005

In February 2005, the FLC Mid-Continent Region participated as an exhibitor at Wildland Fire 2005 in Albuquerque, N.M.

The conference brought together fire service leaders at the local, state and federal levels to address a critical problem facing fire departments around the world.



FLC Mid-Continent Region Support Officer Ann Kerksieck meets with Michael Allen of Southern Mills, Inc. during Wildland Fires 2005.

Wildland Fire 2005 is a collaborative effort of the International Association of Fire Chiefs,

USDA Forest Service and the U.S. Department of the Interior in an effort to provide a networking opportunity with about 1,000 fire chiefs, company officers, firefighters, land use planners, military personnel, and local, state, and federal government representatives.

The conference took a broad look at wildland firefighting, including community actions; emergency response; planning for community and firefighter safety; protecting communities: the social/human element; and healthy landscapes and risk reduction.

The conference provided the format to become more familiar with the people involved in wildland firefighting from—the firefighters to the actual supplier of equipment to mutual research efforts.

The FLC Green Book



Federal Technology Transfer Legislation and Policy provides the principal statutory and presidential executive order policies that constitute the framework of federal T².

FLC TECHNOLOGY LOCATOR MOVES T²

The FLC Technology Locator has been busy receiving and acting upon assistance requests from a wide variety of sources throughout the country.

From the logging industry to telecommunications, the Technology Locator Service has helped make the necessary connections to move the technology transfer process forward by bringing together potential collaborators.

This connection helps scientists, innovators, and entrepreneurs take advantage of the vast reservoir of technology and expertise located within the federal laboratories.

The following is a list of the Locator's most recent successes.

• ENHANCING INDUSTRY PRODUCTIVITY

The information provided by the Technology Locator and the USDA Forest Products Laboratory enabled Castanheira Lumber to identify and classify various species of wood imported from Brazil.

"Your help and contribution have resulted in saving countless hours of wood classification research. The information you provided has also been instrumental in substantial cost savings. Once again, thank you for your time and support. I look forward to working with you in the future. I congratulate the FLC Technology Locator Service." —Javier Ball, Pres., Castanheira Lumber, Weston, Fla.



• CONNECTING POTENTIAL LICENSEES WITH FEDERAL LABS

Greyrock Technology, Inc., is interested in collaborating with Argonne National Laboratory (ANL) to leverage ANL's Smart Sensor Developer Kit for upgrade and additional applications. ANL was contacted regarding the Greyrock request, and Greyrock was provided with the point of contact.

"I now have dialogue going, and it looks like there might be a collaborative opportunity."

—Steve Bassett, VP, Greyrock Technology, Fort Collins, Colo.

• LOCATING EXPERTISE WITHIN THE FLC COMMUNITY

Cytec Corporation's Defense Systems Group requested assistance locating federal laboratories with expertise forming metal plates using explosives.

The Army Research Development and Engineering Center, Picatinny, N.J., and the Army Research Laboratory, Aberdeen Proving Ground, Md., were provided as sources for the expertise required.

"Finding these skills stateside is a great benefit. You folks give government agencies a good name."

—Don Riggs, VP/Defense Systems, Dallas, Texas

• LOCATING TELECOMMUNICATIONS EXPERTS

Foresight Science and Technology, Inc., needed to identify federal labs with experts in the field of optical switches for telecommunications. Lawrence Livermore, Lawrence Berkeley, and Oak Ridge national laboratories, were provided as potential sources.

"I really appreciate the work you did in such a short time. All of the contacts look great."

—Henry Paik, Principal Investigator, Providence, R.I.

• LOCATING MATERIALS EXPERTS



UniQwest Consulting Group was searching for glass or quartz materials that had excellent optical clarity and could withstand high pressure under extremely high heat (4000 to 5000°F).

Sandia National Laboratories and Ames Research Center were provided as potential sources for information.

"We have a few great contacts now going from the FLC help. What a great help you have been!"

—Todd Taylor, VP, UniQwest, Aberdeen, Wash.

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NTTC's Role in Health Care, from page 1

and enhance patient health.

A collaborative effort between the National Technology Transfer Center (NTTC) at Wheeling Jesuit University, the Robert C. Byrd Center for Rural Health at Marshall University, and Walter Reed Army Medical Center, the program will work with underserved rural health care clinics throughout the state.

A federal grant made possible by Sen. Byrd, provides funding for the program.

"West Virginia ranks high in the nation in many of the chronic illnesses, such as diabetes and heart disease," the senator said. "That's why I've worked to expand health care opportunities for all West Virginians, especially those living in rural areas."

The first pilot site for HEALTHeWV is Lavalette Clinic in Wayne County, and program implementation is slated to begin this month.

The clinic will get a web-based disease management system to create and maintain electronic patient records, improve patient provider com-

munication, provide access to patient educational materials, and give fast access to latest evidence-based medicine. "HEALTHeWV is the first step for us," said Sen. Byrd, "and can serve as a model for the rest of the nation."

"We're always looking to reinvest the government's investment for maximum use of federal dollars," said HEALTHeFORCES Program Director Colonel Jill Phillips of Walter Reed Army Medical Center.

"HEALTHeWV is the result of that reinvestment, and it's a privilege for us to be able to support the citizens of West Virginia and continue this project."

The effort was praised by Wheeling Jesuit University vice president for sponsored programs J. Davitt McAteer. "With HEALTHeWV," he said, "physician and clinic partners also have access to online clinical practice guidelines that will ensure more uniformity in the delivery of quality patient care throughout West Virginia."

Centers for Disease Control and Prevention data suggest that over 90 million Americans live with chronic illnesses, which account for more than 75% of the nation's \$1.4 trillion in medical care costs. Chronic diseases also account for 70% of all deaths in the U.S.

"This program is essentially about marrying science with technology and facilitating the development of federally funded research to identify solutions for addressing health care problems," said NTTC CEO James Goulka, who believes his organization is well-suited to the initiative. "NTTC is in a unique position to understand these challenges and recognize opportunities that draw upon all our resources to drive product development."

"Future technology may someday allow a health care provider to conduct an early diagnosis screening test in one location and automatically send the results to a physician located in another part of the state or country," said HEALTHeWV program director Dr. Mazharullah Shaik.

Sandia's Gas Sampling Device, from page 2

a custom-built intake manifold.

Because Thornberg's test mechanism requires only picoliters, his sensitive device can recheck its own measurements — using bursts of gas delivered in a series of puffs — dozens of times from the same crushed device in a 20-minute time span.

The method thus provides statistically significant atmospheric measurements at any given moment in a component's life cycle.

Current industry tests can achieve at best only a single reading from the release of nanoliters of gas. A single, statistically unverified result may contain significant error.

By waiting a longer period of time — weeks, or even months — other microdevices from the same batch can be crushed and then analyzed to

see what changes have occurred in their atmosphere over time.

Currently, the system is able to measure gases emerging in pressures ranging from one atmosphere to .0001 torr. (One atmosphere is 760 torr).

The group hopes soon to decrease its lower sensitivity limit to .000001 torr — in effect, to be able to measure the quality of vacuums.

Said SNL researcher Danelle Tanner, who describes herself as "a reliability-and-aging mechanism physicist" working on a silicon re-entry switch, "We want 100 percent nitrogen [atmosphere] in our device. Steve's group gave us a really good idea of what species other than ni-

trogen were present in the package."

"Maintaining the integrity of the internal atmosphere of a hermetic device is essential for long-term component reliability," said Thornberg. "It is within

this environment that all internal materials age." The Success of his group's new investigatory technique lies in the details of the test mechanism.

A precisely machined sample holder holds the MEMS package to be crushed within the sampler valve. If the sample holder is too low, the part will not crush the MEMS device; too high, and the device will crush prematurely, letting gases escape unmeasured.

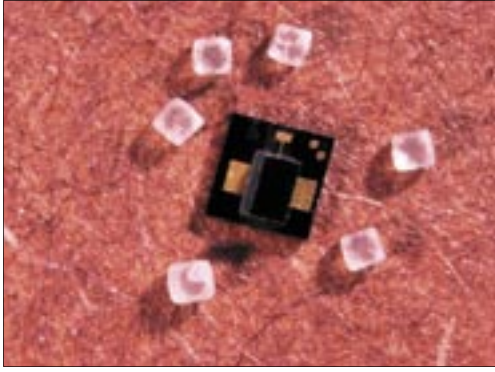
Because tested devices come in many sizes, height adjustments to the crushing mechanisms are needed for each sample.

The problem of debris from the smashed part interfering with gases that must pass through tiny tubes was solved by sintering a filter into a central gasket.

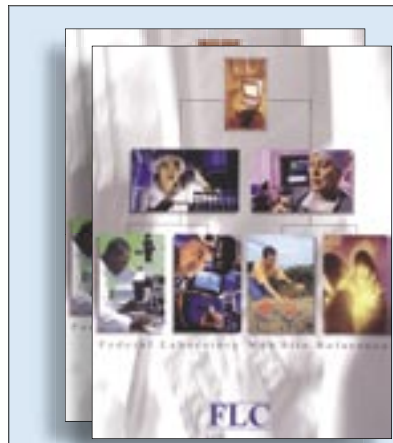
Perhaps most important, manifold volumes were minimized to maximize pressures when MEMS-released gases expand, reducing the amount of gas needed for an analyzable puff.

Still ahead is success in measuring very small amounts of moisture, which stick to manifold walls without making it to the detector.

To overcome this problem, the SNL group is working with Savannah River National Laboratory to incorporate that lab's optical moisture measurement techniques based on surface plasmon resonance (SPR). In that technique, an optical fiber is used to transmit light from a specially coated lens. Moisture levels are measured from wavelength shifts.



A MEMS test unit sits under the black box that contains its atmosphere. The gold plates beside it are wiring sites. Next to the device, for size comparison, are grains of table salt.



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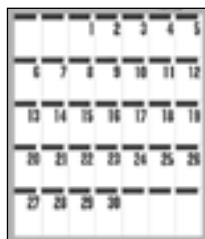
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