

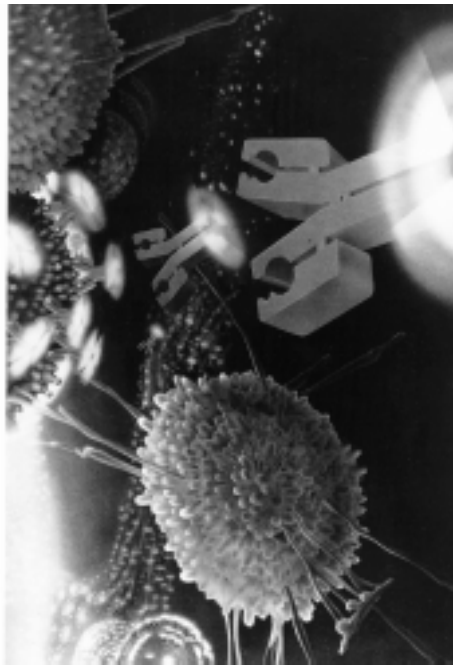


Delivering A Dose Of Hope

Brain cancer patients at Switzerland's University Hospital in Basel are receiving an innovative new cancer therapy that relies on a derivative of nuclear bomb production waste.

Through a process patented by Pacific Northwest National Laboratory (PNNL), an ultra pure form of the medical isotope yttrium 90 is being extracted from waste stores for treatment of a variety of cancers.

In this Phase 1 clinical trial of a brain cancer therapy called beta radiopeptide-brachytherapy, patients receive an injection of yttrium 90 linked to specially engineered peptides. Once inside the tumor, peptides seek and bind to brain tumor cells, delivering a high dose of radiation to



Armed with a "backpack" of radiation, specially engineered antibodies, shown here as Y-shaped clamps, seek out and destroy malignant cancer cells while sparing surrounding healthy tissue.

cancerous cells while minimizing impact to surrounding healthy tissue. The treatment causes few side effects and can be administered on an outpatient basis. Final trial results are expected by summer 1999.

Article courtesy of "PNNL TechNotes"

Contact: Marv Clement at (509) 375-2789

Reminder!
FLC's 25th Anniversary Meeting
April 19-23, 1999

From the Regional Coordinator's Desk

We have many challenges and exciting programs to help the ORTAs in the Far West Region (FWR) in 1999. I would like to briefly address a couple of the programs.



One of the submitted National Demonstration Projects for the FWR's FY-99 budget has been approved by the FLC Executive Board. The region will be working with the Department of Commerce in a new and innovative program called the Federal Resource Access Partnership. The Partnership gives companies the opportunity to work with progressive government agencies and leading national laboratories to access technology transfer, manufacturing, diversification, and exporting resources necessary to increase their competitiveness.

The Program will also involve Economic Development Agencies in counties, and twelve universities and colleges in the FWR. It is our goal eventually to have all the FWR laboratories involved in the project. The FWR support contractor will be contacting each site in the FWR to ensure your resources are accurately represented.

Another major project is in support of the Assistive Technology Program. Surveys intended to match companies with labs involved with appropriate Assistive Technologies are being mailed by the Department of Commerce during February to FWR businesses.

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Vice-president calls on DOE Technology

When Vice-President Al Gore recently called on the Department of Energy to help the Departments of Justice and the Treasury put new, high-tech tools in the hands of law enforcement, he provided a forum to demonstrate new crime fighting technologies. One of the featured new crime-fighting tools was a Laser Induced Fluorescence Imaging (LIFI) system.

Developed by Bechtel Nevada (BN) scientists at the Special Technologies Laboratory for DOE's Nevada Operations Office, LIFI was originally designed to detect uranium oxide in environmental management site characterization and cleanup work. The technology is being adapted to the detection of the optical "signatures" of body fluids, fabrics and dyes.

Law enforcement agencies now use ultra-violet lamps at crime scenes to look for fluorescent materials, such as human blood, but this technique requires near-total darkness. The findings then have to be charted or "registered to the scene" with measurements and photographs. The only currently available alternative is to remove samples and conduct laboratory analysis, which is labor-intensive and time consuming.

With LIFI technology, investigators can immediately survey a crime scene for the presence of body fluids. The camera system includes a real-time video display in false color, making it easy for the operator to identify the locations and types of fluids at the scene. The video display can also be recorded for later review.

"We're leveraging DOE/EM technology," said John DiBenedetto, BN LIFI project manager. "We've done the research that says we can read the optical signatures of body fluids with this technology. Now DOE and the FBI will work together to develop a sensor package specifically designed to meet law enforcement needs."

"If we're going to fight the criminals of the future, we need to develop the crime fighting tools for the future," said the Vice-President. "We must put the best possible tools in the hand of our law enforcement community so they can identify, apprehend, and prosecute criminals swiftly and effectively."

Article courtesy of "DOE/NV Sitelines"

Contact:

John DiBenedetto at (805) 681-2240

Prestigious Renewable Energy Award Presented to FLC Laboratory Representative

Sue Ibrahim, Senior Physical Scientist in Yuma Proving Ground's Technology Transfer Program and an FLC Representative, was recently presented with the prestigious renewable energy award for her innovative work in providing electrical power to a newly constructed remote-test complex in the eastern portion of the proving ground's Kofa Firing Range.

The award was presented by Department of Energy Secretary Bill Richardson and the Federal Inter-agency Policy Committee. What garnered Ms. Ibrahim the award was a blend of creative thinking and the willingness to look "outside the box" to design a long-lasting solution to an energy challenge.

A new facility, called the Smart Munitions Test Complex, is being constructed on the Kofa Firing Range to test "smart" munitions now under development, that use acoustic sensors to detect targets. Acoustic interfer-

"The more you partner and the more you develop projects with members of the outside community, the more everyone wins."

- Ms. Ibrahim

ence considerations dictated that the site be located in a remote area. But providing necessary electrical power to the site by traditional means was cost-prohibitive.



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Award Presented to FLC Lab Rep.

"Solar power proved to be an attractive option," said Ms. Ibrahim.

"Installation of such equipment is an expensive proposition, however. I instituted discussions with officials at Arizona Public Service to come up with a plan for sharing development and construction costs, and the result proved beneficial to everyone. It became a classic 'win-win' situation for all involved."

Ms. Ibrahim obtained photovoltaic panels and storage batteries worth \$1.6 million from a canceled project in Hawaii. Since no funds were available to install the equipment once it arrived at the proving ground, she negotiated a Cooperative Research and Development Agreement (CRADA) with Arizona Public Service (APS) to do that. The end result was a complete 105-kilowatt photovoltaic project that is currently up and running. Annual cost savings to the Proving Ground amount to nearly \$50,000.

Ms. Ibrahim says APS has been pleased with the results so far. The solar generating station will provide them, as well as Yuma Proving Ground officials, with valuable data, which will be used to continue improving solar power technology. "I'm proud that I was able to work together with APS on this project," she said. Ms. Ibrahim is a strong believer in the value of developing relationships for sharing technology between Department of Defense installations and outside organizations for economic growth.

Contact: Sue Ibrahim at (520) 328-3021

Vacuum Distillation System Licensed

The Vacuum Distillation System was developed as an alternate technique for the extraction of analytes (primarily volatile organic compounds) from difficult-to-analyze samples (matrices) such as fish tissue, oil and sediment. Vacuum Distillation is comparable to the traditional purge and trap method of extraction, but it has the advantage of being much simpler.

The non-exclusive license agreement is with Cincinnati Analytical Instruments. The company president, Dr. Prabhakar P. Rao, announced that it had entered into a strategic partnership arrangement with Specialty Fitting & Assembly, Inc., a minority-owned small business located in Harrison, OH, to manufacture the instrument. Cincinnati Analytical Instruments plans to conduct all the sales,

marketing, research and development, and service in house.

The inventor of the technology, Michael Hiatt, works in the EPA-Environmental Chemistry Branch of the Environmental Sciences Division located in Las Vegas, NV. He has been working on this technology for over ten years and has received two patents for different aspects of the technology. Both patents were included under this license agreement.

Dr. Rao intends to have an instrument on display this March at the Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon). He will be sharing booth number 2577 with Specialty Fitting & Assembly, Inc.

Contact: Eric Koglin at (702) 798-2432

Urban Tree Benefits Exceed Costs

With city budgets increasing amid complaints of increased taxes, urban forests are increasingly subject to the budget ax. To counter this trend, values and costs of urban forests are needed to assess their true value to the public.

A study conducted in Sacramento, CA by the USDA Pacific Southwest Research Station, Davis, CA, assessed some of the benefits and costs of that urban forest. The total values of annual heating and cooling savings and air pollution uptake by Sacramento County's six million trees was \$49 million. Approximately 1,457 metric tons of air pollutants were absorbed by these trees annually, primarily ozone and particulate matter. Other forest services include rainfall interception, storm water quality improvement, carbon dioxide removal, human health enhancement, scenic beauty, increased property value, wildlife habitat, community bonding, and recreation opportunities. On the other side of the ledger, the Sacramento City Tree Services Division spends about \$3 million each year or about \$30 per tree. Home owners are estimated to spend \$5 to \$10 per tree for watering, pruning, pest/disease control, and removal.

Results of this research have been used to show the public that their investments in urban forestry really pay off. The methodology developed in Sacramento and elsewhere has been used in urban forestry assessment models developed by private industry and other non governmental organizations.

Contact: Carol A.R. Demuth at (510) 559-6315

FLC Far West - Laboratory Profile

The DOI/BR Water Quality Improvement Center

The Water Quality Improvement Center (WQIC) is a facility located on the site of the world's largest reverse osmosis desalting plant, the Yuma Desalting Plant, near Yuma, AZ. The WQIC provides the means to coordinate the water quality research and field-testing efforts of government, academia, and private industry to efficiently advance such research and make it more cost-effective and practical. Capable of desalting up to one million gallons per day, the WQIC is a cornerstone of the National Centers for Water Treatment Technology initiated by the Bureau of Reclamation and the National Water Research Institute.

How Does it Benefit Industry?

The WQIC benefits society and industry in several ways by:

- providing a site for hands-on training of personnel in water treatment and desalting-plant operations,
- enabling the investigation and development of new and improved water-treatment technologies, and
- accelerating the transfer of technology to private industry by making pilot-scale water research more feasible.

Who Can Use the WQIC?

Federal and state agencies, desalting researchers, universities, water treatment companies, municipalities, private industry, and foreign entities may use the WQIC to perform research on water quality technology. Researchers who want to test equipment or investigate processes at the WQIC will be able to do so via a Cooperative Research and Development Agreement (CRADA).

Role of the WQIC

Many communities in the United States and around the world rely on water supplies containing high levels of salts and other contaminants that may present health risks. The WQIC plays an important role in uniting the nation's efforts to advance the science and engineering of water purification technologies.

WQIC Facilities include:

- Physical facilities such as grit sedimentation, water softening, rapid mixing, flocculation, clarification, sludge removal, and dual or multi-media filtration.
- Chemical processes for disinfection, pH adjustment, anti-scaling, and membrane rejuvenation. Customers may supply other chemical processes for use/testing at the WQIC.
- Membrane processes for testing reverse-osmosis microfiltration, ultrafiltration and nanofiltration. Customer may supply other processes for use/testing at the WQIC.
- One 600-gpm and two 50-gpm process trains with a 600-gpm con-

nection to an on-site groundwater well where a range of brackish feedwater salinities can be made.

- Fully instrumented processes which feature a networked Supervisory Control and Data Acquisition computer system with Internet access.
- Fully furnished office facilities.

WQIC Services include:

- Experienced facility operators available 24 hours a day.
- Engineering and technical staff with expertise in water-treatment processes and instrumentation.
- Fully staffed water laboratory licensed by the State of Arizona that participates in the U.S. Geological Survey, the Environmental Protection Agency, and the Environmental Resources Associates quality control programs.
- Existing discharge and waste permits.
- Utilities including telephone, fax, and computer data transfer lines.

Contact: Paul McAleese at (520) 343-8229

Fresh Air Technology

Indoor air could become a lot safer to breathe with a technology developed by scientists at the Idaho National Engineering and Environmental Laboratory. The Indoor Air Quality Monitoring and Control system, made up of a set of off-the-shelf sensors, makes use of a series of computer programs which detect airborne chemicals and compares them to a stored library of readings.

The program can be customized for a particular building, with applications ranging from alleviating "sick building syndrome" to detecting decaying produce in potato cellars. The system could also save money and energy.

Article Courtesy of "LBNL Currents"

Contact: Steve Hartenstein at (208) 526-1967

CRADA Opportunity: Bio-based Disposable Containers Using Wheat Starch

The starch group at the USDA's Agricultural Research Service, Western Regional Research Center (WRRC), is researching the potential for making containers for the fast-food industry from wheat starch. Disposable containers containing potato starch, water, and cellulose fiber are currently being developed by the private sector. The cost of these containers could be substantially reduced if they were made from a starch that was less expensive, such as wheat starch.

Researchers at WRRC have developed formulations containing wheat starch that can be molded, using a wafer process, into lightweight foam panels. The panels, white in color, have densities in the range of 0.09

cc to 0.18cc. These results indicate that low-density foam panels with high tensile strength can be made using wheat starch in place of potato starch. The next phase of the research will involve applying various coatings to the starch-based panels and testing to determine their effect on water-vapor permeability. The Washington and Idaho Wheat Commissions provided seed money for this project. WRRC is seeking a commercial partner with expertise in bio-based packaging to join them in research and development.

Contact: Gregory Glenn at (510) 559-5677

FALL 1999
FW Regional Meeting &
Training
Las Vegas, NV
Nov. 22-23, 1999
Las Vegas Hilton

The Fall 1999 Far West Regional meeting will be co-located with the National SBIR/STTR Conference to be held at the Las Vegas Hilton in Las Vegas, NV. In addition to our regional meeting, we are developing plans for a Representative training program on one of the days. You will also have the opportunity to develop linkages with the high tech small businesses attending the SBIR/STTR conference. We will be working with the SBIR sponsors to help provide these partnership opportunities for technology transfer.

Additional information will be available on the SBIR Conference website: www.zyn.com/sbir



NASA Scientists & Engineers Talk to Students on the Internet During Black History Month

Students from around the world had the opportunity to "chat" with NASA's African-American scientists, engineers and others over the Internet during February, Black History Month. During these chats, students with access to computers typed their questions and received answers from the experts.

The chat sessions began February 2, with Dr. Aprille Ericsson-Jackson, an aerospace engineer at NASA's Goddard Space Flight Center, Greenbelt, MD. During the chats, Ericsson-Jackson and the other Afri-

can-American professionals described their contributions to the space program. "I feel obligated to help spur the interest of minorities and females in the math, science and engineering disciplines," said Ericsson-Jackson. She received the "Women in Science and Engineering" award as the best female engineer in the federal government in 1998.

Representing diverse careers, scheduled participants included a NASA nutritionist, an aerospace engineer, and an operations specialist

from mission control at NASA's Ames Research Center, Moffett Field, CA. These chats will enable students to meet mentors via the Internet in a very personal way.

The Black History Month chats are sponsored by NASA's Quest Project based at Ames. Chat sessions can be accessed at quest.arc.nasa.gov/ltc/special/mlk99

Partnership to Diagnose “Virtual Hospital”

NASA's Ames Research Center and Salinas Valley Memorial Hospital recently signed a Space Act Agreement to be partners in the implementation of state-of-the-art information technologies to develop a “virtual hospital” in 1999. Ames is NASA's Center of Excellence for Information Technology and has strong three-dimensional imaging capabilities in its Center for Bioinformatics. Under the terms of the agreement, Ames will establish a workstation at the hospital capable of transmitting data and receiving three-dimensional images of the human body. The hospital will transmit diagnostic data to Ames over NASA's Research and Education Network (NREN). Hospital medical teams will be able to evaluate and manipulate the three-dimensional images over NREN.

When the virtual hospital demonstration begins operations during 1999, Salinas Valley Memorial Hospital physicians will be able to provide feedback to NASA regarding

image quality and network efficiency. A virtual hospital is defined as a health care facility with technology to transmit and manipulate electronically three-dimensional high-fidelity resolute images in real time.

Future plans call for Ames and the hospital to work cooperatively with Stanford University Medical Center and the Cleveland Clinic in exploring the possibility of implementing the virtual hospital technology to remote areas around the world and eventually in space. The three hospitals, all major cardiac centers, would use high-speed Internet links to exchange images and information. The virtual hospital would also enable doctors to conduct cooperative training exercises and be able to perform “dry run” surgeries using three-dimensional images.

Article Courtesy of “NASA Innovations”

Contact: Dr. Muriel Ross at (650) 604-4804

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From the Regional Coordinator's Desk

A few months ago, I closed the support office in San Diego, CA aiming to improve operating efficiency and service in the FWR. As most of you know, the region is now supported by DelaBarre & Associates, Inc. (DBA), a contractor very experienced in assisting the FLC. That experience is available to help FWR ORTAs and sites. Please use DBA for assistance, guidance, technical knowledge, and computer and database support related to your FLC involvement. Make DBA a part of your T2 team.

To close, I am encouraging all FWR members to attend the FLC's 25th Anniversary Meeting being held April 19 thru 23, 1999, in Salt Lake City, UT. The program is interesting and dynamic. Our region will meet on April 22 at 4PM. Discussion will include the ORTA's needs and their involvement with the current and future Demonstration Projects.

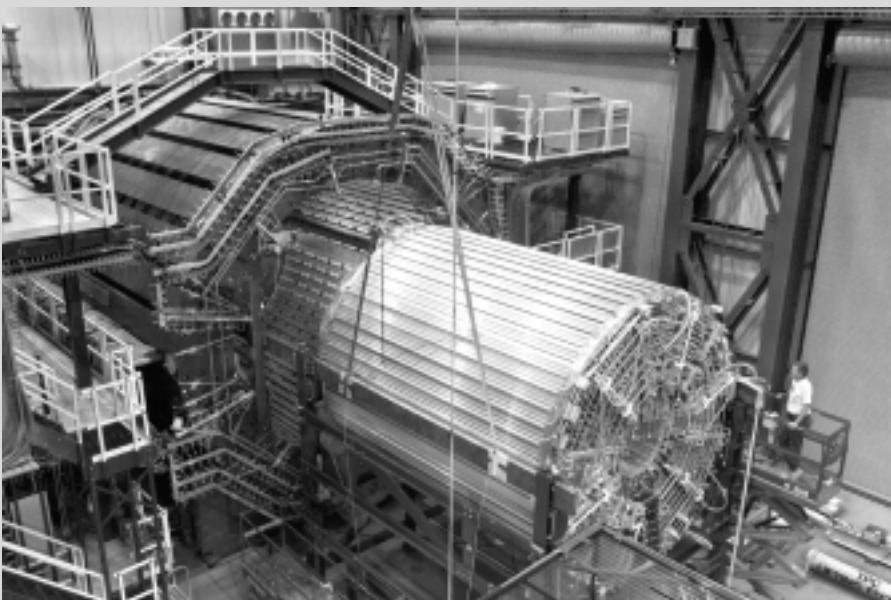
I hope to see you in Salt Lake City!

Dr. Mike Sullivan

sullivanme@navair.navy.mil

<http://happy.mugu.navy.mil/TT>

Far West Technology Transferred to the Northeast Region



The Time Projection Chamber of STAR, originally built at Berkeley Lab, is now getting settled in its new home at Brookhaven National Laboratory. STAR - the Solenoidal Tracker a RHIC (Relativistic Heavy Ion Collider) - will be used to study quarkgluon plasma, the dominant state of matter in the early stages of the universe.

- Courtesy of LBNL Currents Newsletter; Photo by Roy Kaltschmidt

NASA Uses Internet to Feature Women, The First in Their Fields

From the first woman Space Shuttle commander, Eileen Collins, to actress Kate Mulgrew, the first female starship captain on prime-time TV, at least 14 female pioneers in their fields will participate in NASA Internet "chats" and other activities for students. The Internet events will continue through March, Women's History Month, and beyond with the list of "female firsts" growing.

The Internet events, called Female Frontiers, will culminate in a two-hour Internet broadcast live from Kennedy Space Center, FL, at the time of Collins' upcoming STS-93 Space Shuttle launch, yet to be scheduled. Student "ambassadors" will present the STS-93 webcast for other young people worldwide. "By focusing on Commander Collins' remarkable accomplishments, we are giving young girls everywhere the message that they, too, can break traditional barriers in their career choices," said Tish Krieg, who organized the on-line events from NASA's Ames Research Center, Moffett Field, CA.

During an Internet 'chat,' youngsters use computers to converse live with interesting professionals by typing questions and reading responses and dialogue via the World Wide Web. The Jan. 28th chat featured Libby Riddles, the first female to win the Alaskan Iditerod dog sled race. "Although you might not think so at first, math and science are important in my career," she said. "With the dogs, one of the most scientific aspects is the nutrition, which requires math to figure out proportions and calories per kilogram of different foods, etc."

Representing diverse careers, female mentors will also include the first American woman to walk in space, Kathryn Sullivan, and the first female captain of America's Cup, Dawn Riley. Some of the other women featured

include Sally Ride, the first American female astronaut; Dee O'Hara, the first nurse to NASA astronauts; Jean Bartik, the first female computer programmer; Shirley Temple Black, the first female chief protocol; and California's 10th Congressional District U.S. Rep. Ellen Tauscher, the first female to hold a seat on the New York Stock Exchange.

Participation is easy. "If you have a personal computer with Internet access, you can log onto the NASA site to see a schedule, background information about the featured woman, chat instructions and pre-registration materials. Then go to the chat room, and follow directions," said Linda Conrad who is also one of the organizers of Female Frontiers.

First-come, first-served pre-registration via the Internet is required in order for students to contribute to the chats. Other people can observe the conversations without registering. Educators can also find instructional materials on the site. Materials are cross-curricular covering subjects such as social studies, science, language arts and mathematics. Female Frontiers chats are sponsored by NASA Quest, based at Ames.

"The Female Frontiers project is just one of many Internet projects that we conduct to benefit students," said Karen Traicoff, manager of NASA Quest. "Quest hosts interactive Internet activities year round that connect students with interesting people and their work. Research has shown that students learn better by real-life experiences" she said.

The Quest URL is: quest.arc.nasa.gov Check the Quest website for Female Frontiers' complete schedule: quest.arc.nasa.gov/space/frontiers/schedule.html

New Technology Turns French Fry Oil Into Diesel Fuel

Crispy, golden french fries are a main part of many American meals. Now, the vegetable oil they are fried in has become the main ingredient in a new alternative diesel fuel known as "biodiesel." And while french fries are known as junk food, the new biodiesel is anything but junk fuel.

Thanks to a new process developed by INEEL researchers Bob Fox and Dan Ginosar, used french fry oil can be converted into an environmentally friendly diesel fuel faster and less expensively than current processes while producing an even higher grade fuel.

The process of converting vegetable oils or animal fats to diesel fuel is nothing new. Biodiesel fuel has been produced and tested for years as an alternative to petroleum-based diesel fuel, or "petrodiesel."

Using biodiesel in place of petrodiesel offers some distinct advantages. First, the biodiesel is much more environmentally friendly. It burns cleaner and more completely, meaning less pollution. Pollutants include hydrocarbons, sulfur, carbon monoxide and particulates, which are responsible for the thick black exhaust

clouds that foul the air behind some diesel-powered vehicles.

Biodiesel is also free of aromatic compounds, the substances that give fuel its 'cetane' rating (diesel's equivalent of gasoline's more familiar octane rating). However, these compounds include toxic chemicals like benzene and toluene and are carcinogenic. Biodiesel actually has a better cetane rating than petrodiesel without using aromatics. Particulates and aromatic compounds lead to the familiar, caustic odor of burned petrodiesel fuel.

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Biodiesel has a different, yet probably more familiar odor when it burns, it smells like fried chicken.

Unfortunately, the current method of producing biodiesel is very time-consuming. Making the fuel is not a continuous process. Instead, it is made in batches that take two or three days to complete.

Working in the Idaho National Engineering and Environmental Laboratory Research Center labs, Fox and Ginosar have developed a new method that produces a higher grade biodiesel with less waste at a lower cost. Their technology eliminates the need for a base liquid, which thus eliminates the need for acid to neutralize the base and water to rinse away the acid. The process is continuous, without all the steps and the unnecessary wastewater.

The process also results in a better separation of biodiesel and glycerol,

and a cleaner, higher grade of both substances. The high quality glycerol produced by the new process is very valuable. Conservative estimates place high-grade glycerol at close to \$10 per gallon. Fox and Ginosar believe sales of the glycerol could pay for the entire process.

Much of the researchers' study was done with used french fry oil donated by the J.R. Simplot Company. For Simplot and other food processors, the large volumes of used vegetable oils is a real liability. Transporting the oil to landfills or "yellow oil" markets is expensive, so the prospect of turning a waste product into fuel to power its large trucking fleet is appealing.

Fox and Ginosar envision a time when waste-oil-to-biodiesel conversion plants are connected to food processing plants everywhere, giving processors an environmentally sound source of fuel.

Contact: Charles Briggs at (208) 526-0441

Upcoming Events

March 16-20, 1999
CSUN: Technology & Persons with Disabilities
Los Angeles, CA
Center on Disabilities: (818) 677-2578

April 19-23, 1999
FLC Annual Meeting
Wyndham Hotel * Salt Lake City, UT
FLC-MSO: (609) 667-7727 x182
www.fedlabs.org

May 3-5, 1999
Electrochemical Society's Spring Technical Expo & Conference
Seattle, WA
www.electrochem.org

May 17-19, 1999
SBIR Regional Meeting
Billings, MT
(360) 683-5742 * www.zyn.com/sbir

June 25-29, 1999
Rehabilitation Eng. & Assisive Tech. Society of North America (RESNA)
Long Beach, CA
(703) 524-6686 * www.resna.org

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