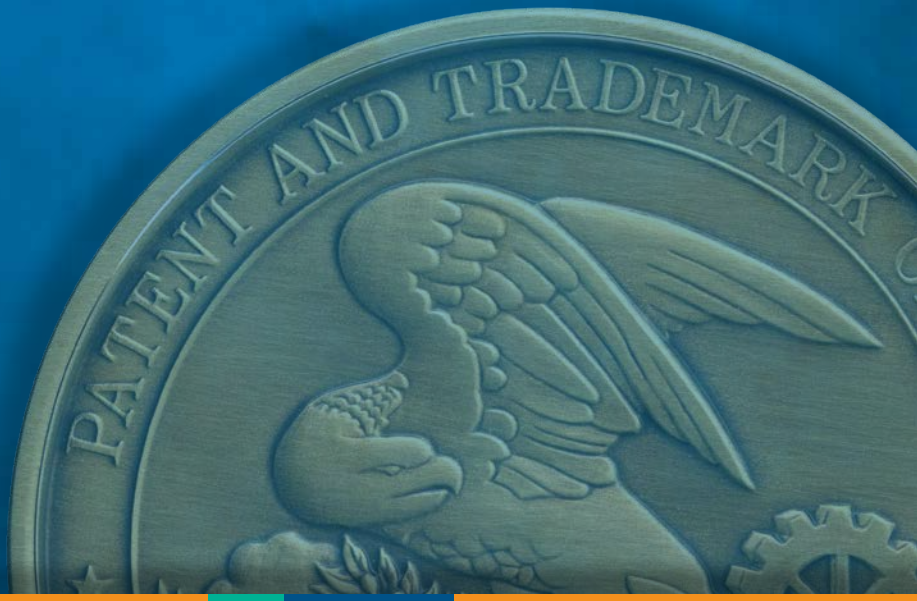
Savannah River National Laboratory™
OPERATED BY SAVANNAH RIVER NUCLEAR SOLUTIONS

2013 • SAVANNAH RIVER NATIONAL LABORATORY

Research and Technology Recognition Reception

APRIL 25 • NEWBERRY HALL • AIKEN SC



"What we are celebrating is really the heart and core of SRS. It is that **spirit** of finding new solutions, new ways to address problems, integrated with a wide set of **capabilities** at the Savannah River Site, that allows us to solve really big challenges for the nation."

Dr. Terry Michalske
SRNS Executive Vice President and SRNL Director

2013 Research and Technology Recognition

PATENTS • LICENSES • CRADAS • AWARDS • LABORATORY DIRECTOR AWARDS • FELLOWS

"Recognizing these people is important as is congratulating them on the **strengths** and **longevity** they are placing in the Savannah River National Laboratory."

Dwayne Wilson
SRNS President and CEO

"This is a night for the **inventors**, a night to recognize their **accomplishments**, which are extremely important to the country and the Savannah River Site."

Dr. David Moody
Manager, DOE-Savannah River

Steve Wach
Director,
Strategic Development and
Technology Partnerships *(Acting)*

Congratulations to all this year's honorees.

This is your night—a time to celebrate the many technology transfer successes and accomplishments over the past year of strategic importance to SRNL and our future.

The research you conduct and the resulting intellectual property are instrumental in strengthening our core competencies and to the creation of an ever-widening spectrum of new business opportunities.

The partnerships you help establish provide positive commercial impacts, foster essential stakeholder support and bolster our technology transfer mission.

With your dedication and leadership we continue to build on SRNL's growing reputation as a National Laboratory.

I commend you and thank you for your hard work, ingenuity and your many accomplishments we honor here this evening.

Patent Award Recipients

Dr. Zidan

Dr. Gray

Dr. Ragaiy Zidan
Dr. Joshua Gray

Patent #8,124,559

Destabilized and Catalyzed Borohydride For Reversible Hydrogen Storage

A new hydrogen storage material formed by combining a borohydride with various alanates to store and release higher amounts of hydrogen at lower temperatures than the borohydride itself. LiBH4 contains 18 wt% hydrogen, an amount higher than any other known hydrogen storage material. LiBH4 can be used for hydrogen storage and energy systems making use of stored hydrogen. Borohydrides release hydrogen at very high temperatures, with temperatures usually exceeding their melting point. Catalyzing borohydrides with alanates at high temperature and pressure has shown an uptake and release of hydrogen at more favorable temperatures.

Mr. Swygert

Richard W. Swygert

Patent #8,250,992

Ladder Attachment Platform

A new railcar switchman platform for enhanced safety of railroad personnel. The switchman platform is designed to attach to the railcar ladder providing a stable platform from which the switchman can perform their duties.

Dr. Ragaiy Zidan

Patent #8,105,974

Destabilized and Catalyzed Borohydride For Reversible Hydrogen Storage

Patent Award Recipients

Dr. DiPrete

Dr. David P. DiPrete

Patent #8,133,740

Colorimetric Detection of Uranium in Water

A simple and cost effective method for determination of uranium in groundwater was jointly developed by Clemson University and SRNS. The method involves concentration and complexation steps to detect levels of uranium below the EPA maximum concentration limit for groundwater. The color indication from the complexation can be viewed as a qualitative indicator or quantitatively measured using a UV-VIS Spectrophotometer.

Dr. Brigmon

Mr. Berry

Dr. Robin Brigmon
Christopher Berry

Patent #2,171,093

Biological Enhancement of Hydrocarbon Extraction (BioTiger™)

A new environmental biocatalyst for improving the recovery of hydrocarbons entrained in sediments utilizing a patented consortium of microbes known as BioTiger. The action of the BioTiger organisms on the oily portions of the sand increases the amount of recoverable bitumen. Tests have shown the microbial activity increases extraction efficiency by 50% after four hours and over 80% after 24 hours.

Dr. Riha

Dr. Brian D. Riha

Patent #8,211,687

Thixotropic Gel for Vadose Zone Remediation

A thixotropic gel and process for use of the gel in subsurface bioremediation. The thixotropic gel provides a non-migrating injectable substrate that can provide below ground barrier properties. In addition, the gel components provide for a favorable environment in which certain contaminants are preferentially sequestered within the gel and subsequently remediated by either indigenous or introduced microorganisms.

Mr. Cordaro

Joseph V. Cordaro

Patent #8,212,684

Industrial Universal Electrometer

The Industrial Universal electrometer (IUE) is a device capable of measuring current in the low femto-amp to micro-amp range under uncontrolled field conditions. The electrometer is programmable and shielded from radio frequency and magnetic fields for fail safe operations. It is also temperature compensated and resistant to changes in humidity. Commercial electrometers are typically designed for controlled laboratory environments. A unique feature of the IUE includes an isolated pre-amp that uses teflon insulation to shield it from the chassis. The pre-amp uses a temperature compensated auto-zero circuit that automatically corrects for zero drift every 30 seconds.

Patent Award Recipients

Dr. Fondeur

Dr. Fink

Dr. Fernando F. Fondeur
Dr. Samuel D. Fink

Patent #8,037,945

Atomic Force Microscope with Combined FTIR-Raman Spectroscopy Having a Micro Thermal Analyzer

An atomic force microscope was modified with a micro thermal analyzer, and infrared light generator, and a laser to measure sample movement and other molecular properties. A fiber optic receives the directed laser from the micro thermal analyzer and sends it to a Charged-Coupled Detector (CCD) which communicates information to a microprocessor to provide topographic, thermal and molecular species of samples. A sample enclosure was added to contain the sample for controlled atmospheric conditions.

CRADAs (Cooperative Research and Development Agreements)

Dr. Amoroso

Dr. Choi

Dr. Marra

Dr. Johnson

Dr. Peeler

Dr. Jake Amoroso
Dr. Alex Choi
Dr. Jim Marra
Dr. Fabienne Johnson
Dr. David Peeler
Dr. Tommy Edwards

Air Products

(CR-012-002)

The nature of the collaboration with Air Products is modeling and experimentation, to develop a preliminary understanding of compositional relationships for a glassy slag material for municipal waste residues resulting from a gasification process. The overall objectives of this study are to define an acceptable composition range for producing a glassy and non-leaching slag. Gasification is a new approach to municipal waste disposal that generates energy and has many potential environmental benefits relative to current practices.

CRADAs (Cooperative Research and Development Agreements)

Dr. Summers

Dr. Colon-Mercado

Dr. Bill Summers
Dr. Hector Colon-Mercado
Dr. John Steimke

Air Products (CR-012-006)

The overall objectives of this collaboration are to demonstrate the effectiveness of the SO2 Depolarized Electrolyzer (SDE) for hydrogen and sulfuric acid production from pure sulfur dioxide and to study the impact of increased active electrode surface area on the performance with respect to hydrogen and sulfuric acid formation. Air Products is the world's largest supplier of hydrogen.

Licenses

Dr. Zidan

Dr. Wellons

Dr. Ragaiy Zidan
Dr. Matthew Wellons

High Capacity Hydrogen Storage Nanocomposite Materials

EVAXA Energy Systems

New processes to add metal hydrides to nanocarbon structures to yield high capacity hydrogen storage materials. Testing of these materials has shown that hydrogen can be efficiently absorbed and released in multiple cycles and in significant quantities. Processes to add Lithium Hydride to Fullerenes have resulted in structures that can retain and release significant quantities of hydrogen at lower temperatures and pressure.

Mr. Blount

Gerald Blount

Carbon Capture/Sequestration Process

Partnering in Innovation, Inc.

A new and efficient process to produce biofuels from coal and other biomass. The new single-step hydrolysis process co-converts coal and any biomass to a liquid fuel while generating a high purity carbon dioxide as a byproduct.

Licenses

Mr. Maxwell

Sherrod Maxwell III

Actinide Recovery in Very Large Soil Samples

Eichrom Technologies

A rapid actinide separation method has been developed and implemented that allows the measurement of plutonium(Pu), americium(Am) and curium(Cm) isotopes in large soil samples (100–200 g). Using stacked TEVA Resin™ TRU Resin™ and DGA-Resin™ cartridges from Eichrom Technologies (Darien, IL) allows the rapid separation of Pu, Am and Cm using a single multi-stage column combined with alpha-spectrometry. This provides high tracer recoveries and effective removal of interferences with small extraction chromatography columns instead of large ion-exchange resin columns that generate acid waste and with vacuum box cartridge technology, sample prep time is minimized.

Mr. Marzolf

Mr. Hera

Dale Marzolf
Kevin Hera

Pneumatic Conveyance Apparatus and Process

FD Technologies LLC

The Pneumatic Conveyance Device is capable of dislodging, capturing, and conveying solid material, wet or dry, from a depth of 70+ feet, while discharging through a 100+ foot conveyance hose. The device was developed to remove water and solid material from the annular space between the tank and line of a buried, double-hulled tank. The device relies on pneumatic "push" technology rather than the "suction" technology that has been traditionally used in pneumatic conveyance devices.

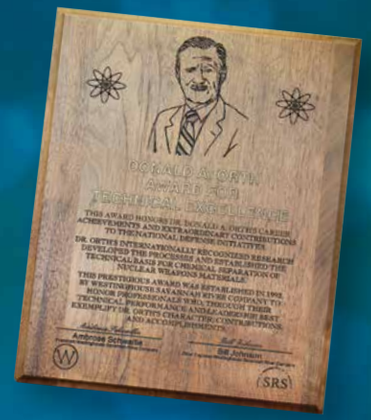
Award Recipients

Mr. Cordaro

Don Orth Award of Merit

Joseph V. Cordaro

The Don Orth Award of Merit was established in February 1992 to honor Donald Orth for his numerous accomplishments and contributions. This award is given to an individual who by character, technical performance and leadership best exemplifies Donald Orth's character and contributions. It is the highest distinction at SRS to recognize the ideals of technical excellence and leadership.



Laboratory Director Awards

Early Career Exceptional Achievement

Matthew Howard, Dr. Ted Nichols, Dr. Brenda Garcia-Diaz, Dr. Kevin Fox

Mr. Howard

Dr. Nichols

Dr. Garcia-Diaz

Dr. Fox

Award Recipients

Laboratory Director Awards

Exceptional Scientific and Engineering Achievement

Dr. Christopher Bagwell, Dr. Anna Knox, Matthew Parker, Dr. Greg Flach, J. Rusty Coleman, Dr. Elizabeth Hoffman, Dr. Lindsay Sexton, Dr. Kathryn Taylor-Pashow

Dr. Bagwell

Dr. Knox

Mr. Parker

Dr. Flach

Mr. Coleman

Dr. Hoffman

Dr. Sexton

Dr. Taylor-Pashow

Technical Society Fellows

Dr. Duignan

Dr. Mark R. Duignan

American Society of Mechanical Engineers

Dr. Duignan is a mechanical engineer with 28 years of experience in experimental heat transfer and fluid flow, aerosol testing, small column ion exchange testing, and pilot plant project development, including design, fabrication, instrumentation, calibration and procedure development. He is recognized by DOE's research community for his contributions in the field of fluid flow and thermal analysis. Dr. Duignan's contributions to SRNL's work on behalf of the Hanford Site Waste Treatment and Immobilization Plant, which separates high level waste from low level waste, resulted in benchmark data that allows more accurate planning.

Dr. Cozzi

Dr. Alex D. Cozzi

American Ceramic Society

Dr. Cozzi's research has focused on cementitious waste forms for radioactive waste disposal. In addition to supporting the Savannah River Site's Saltstone Facility, he is contributing to the development of the cementitious waste form and process for the Department of Energy's Hanford Site. He also contributed to the development of the cementitious waste forms for the Waste Solidification Building currently under construction at SRS.

He received his B.S. in Ceramic Engineering from the New York State College of Ceramics at Alfred University, and a Master of Science degree in Materials Science and Engineering.

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