

R&D 100 award-winning technologies are selected based on “demonstrable technological significance compared with competing products and technologies.”

In the past five years, Sandia has been awarded 23 R&D 100 awards.

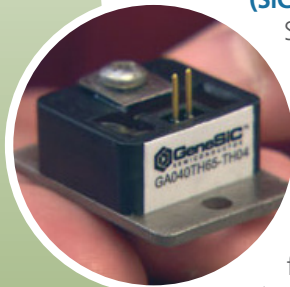
For more information
please contact: ip@sandia.gov

Sandia's R&D 100 Award-Winning Technologies

Each year, R&D Magazine honors the top 100 technology products that exemplify significant, innovative research and development advances. Researchers from Sandia National Laboratories compete internationally for these honors as hundreds of technologies are nominated from universities, private corporations, and other government laboratories. Since 1963, the R&D 100 Awards have identified revolutionary technologies newly introduced to the market. Many of these have become household names, helping shape everyday life for many Americans.

2011 R&D 100 AWARD WINNERS

ULTRA HIGH VOLTAGE SILICON CARBIDE (SiC) THYRISTOR



Sandia's SiC-based Thyristors can reduce next-generation Smart Grid power electronics system size and weight by up to an order or magnitude over existing technologies and offers 10 times higher voltage, 100 times faster switching frequencies, and higher-temperature operation when compared to conventional Si-based Thyristors.

BIOMIMETIC MEMBRANES FOR WATER PURIFICATION

Sandia's synthetic membrane mimics the nanoscale design features of natural water purification channels, resulting in a 10-fold improvement in water purification efficiency when compared with state-of-the-art [reverse osmosis] membranes.

MICRORESONATOR FILTERS AND FREQUENCY REFERENCES

Sandia's microresonator technology enables miniature acoustic resonators, when grouped together, to perform RF filtering and frequency synthesis (such as clocking) in next-generation wireless devices.

DEMAND RESPONSE INVERTER

Sandia's Demand Response Inverter (DRI) is a multi-port power flow control system that increases renewable energy throughput, mitigates renewable energy intermittency, and provides very high conversion efficiency and reliability.

2010 R&D 100 AWARD WINNERS

ACOUSTIC WAVE BIOSENSOR FOR RAPID POINT-OF-CARE MEDICAL DIAGNOSIS

Sandia's Acoustic Wave Biosensor is a handheld, battery-powered, portable detection system capable of multiplex identification of a wide range of medically relevant pathogens and their biomolecular signatures—viruses, bacteria, proteins, and DNA—at clinically relevant levels.

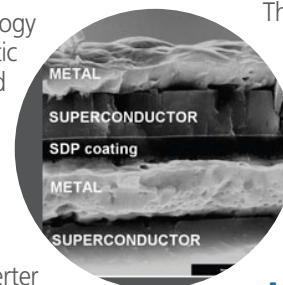
CANARY: EVENT DETECTION SOFTWARE

Sandia's CANARY software enables immediate detection of changes in water quality by analyzing subtle changes measured by on-line sensors and tracking data over successive time intervals, in order to predict when a potential contamination alarm is real.

MULTIFUNCTIONAL OPTICAL COATINGS BY RAPID SELF-ASSEMBLY

This technology offers a simpler, less expensive approach to manufacturing nanostructured optical coatings, with architectures and properties not attainable by current processing methods, by utilizing the self-assembly of polymers.

SOLUTION DEPOSITION PLANARIZATION



This process reduces manufacturing costs associated with producing superconducting wires required for power transmission, and enables high power density support by aligning the crystalline structure of the superconductor over long distances.

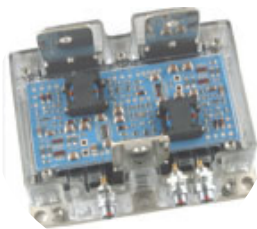
MICRO POWER SOURCE

Sandia's Micro Power Source is a rechargeable ultra-small form factor power source that integrates a lithium-ion-based solid electrolyte battery with an ultra-thin photovoltaic cell as an energy harvester, enabling micro-devices to become active (rather than passive) participants in their environments.

2009 R&D 100 AWARD WINNERS

ULTRALOW-POWER SILICON MICROPHOTONIC COMMUNICATIONS PLATFORM

Sandia's Silicon microphotonic modulators and bandpass switches establish a platform of ultralow-power silicon microphotonic communication elements capable of addressing the bandwidth and power consumption problems of high-performance computer and data communication networks.



HYPERSPECTRAL CONFOCAL FLOURESCENCE MICROSCOPE SYSTEM

Sandia's unique multivariate algorithms and software is combined with the hyperspectral microscope to form a complete system to enable the extraction of quantitative image information from hyperspectral images at diffraction-limited spatial resolutions.

NANOCORAL

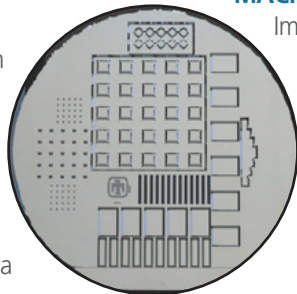
NanoCoral can significantly reduce platinum metal usage and the cost of platinum catalysts for use in renewable energy applications by producing platinum catalysts that offer unique control over the shape, size, porosity, composition, stability, and other functional properties of platinum nanostructures.

CATAMOUNT N-WAY LIGHTWEIGHT KERNEL

Catamount significantly increases the raw performance of critical message-passing operations by using the existing features of a multicore processor to cut the memory bandwidth requirement of message-passing-based applications in half.

ARTIFICIAL RETINA PROJECT

To help those suffering from retinal degenerative diseases, Sandia created a bio-electronic retinal implant using application-specific integrated circuits to convert digital images into electrical signals in the eye enabling the brain to create a visual image.



HIGH TEMPERATURE SiC POWER MODULE

Sandia's high-temperature SiC-based half bridge power electronics module with an integrated gate driver is designed for driving electric vehicle motors and converting DC power supplied by solar arrays.

2008 R&D 100 AWARD WINNERS

XYCE 4.0.2

This analog tool is capable of full simulation of large digital circuit systems through massively parallel computation, accurately simulating more than 10 million circuit elements on hundreds of processors.

SUPERHYDROPHOBIC COATING

This transparent coating is impermeable to water and can be applied through standard methods to serve a number of applications including preventing corrosion, protecting electronics and antiquities, and providing a new, more efficient surface to collect pure water.

SILICON MICROMACHINED DIMENSIONAL CALIBRATION ARTIFACT FOR MESOSCALE MEASUREMENT MACHINES

Improving the measurement accuracy for miniaturized devices, the Sandia MEMS-based 3D physical artifact calibrates a variety of inspection systems with 10 times more accuracy than other methods.



2007 R&D 100 AWARD WINNERS

ELECTRONEEDLE BIOMEDICAL SENSOR ARRAY

When pressed against the skin, this device makes a rapid, multiplexed diagnostic measurement providing a painless and rapid measurement of biologically relevant molecules without having to extract fluids for later analysis.

ARCSAFE

This patented electrical wiring diagnostic uses a high-voltage, low-energy short pulse to detect and locate wiring insulation defects in commercial aircrafts.

MODE-FILTERED FIBER AMPLIFIER

This elegantly simple technology enables the fabrication of practical, high-power, highbeam-quality laser sources that are compact, rugged and extremely efficient by effectively decoupling fiber core size from beam quality.

SELF-ASSEMBLING PROCESS FOR FABRICATION TAILORED THIN FILMS

Sandia's Self-Assembling Process for Fabricating Tailored Thin Films is a simple, economical nanotechnology coating process that enables development of nanoparticle thin films with architectures and properties unattainable by any other processing methods.

NOVINT FALCON AND NOVINT/SANDIA 3D-TOUCH SOFTWARE

Introduced initially as a gaming controller, this technology is the first controller that makes high-fidelity interactive 3D touch possible and practical for consumer computing applications.