R&D

Research & Development

R&D 100 Awards Recognition Ceremony

May 2005

Los Alamos
NATIONAL LABORATORY
EST. 1943

R&D 100 Awards Recognition Ceremony

Thursday, May 26, 2005
Bradbury Science Museum
Los Alamos, New Mexico

Los Alamos
NATIONAL LABORATORY
EST.1943

From the Director

The recognition Los Alamos National Laboratory receives through its participation in *R&D Magazine's* annual, international, R&D 100 Awards competition calls attention to the broad scope of achievements the Laboratory contributes to technological innovation in this country and, indeed, the world. Our discoveries in science and the applications that result play an important role in shaping the future of our nation. When we transfer our inventions and technological advances from the Laboratory to the private sector for commercial development, we strengthen the nation's economic security by enhancing our industrial competitiveness.

I commend our researchers for the diligence and creativity they have applied to developing the technologies submitted to this year's competition. I am pleased with the diversity of applications, which range from unique advances in hazardous detection devices, biological profiling, and computer simulation and visualization, to energy management, nanomaterials and tinted windows.

I believe every submission represented here is a winner for the Laboratory, the University, and the American taxpayers.

G. Peter Nanos, Jr.
Laboratory Director

The R&D 100 Awards

For the past 27 years, Los Alamos National Laboratory has submitted descriptions of its most innovative technologies to R&D Magazine's annual R&D 100 Awards competition. This competition is designed to honor significant commercial promise in products, materials, or processes developed by the international research and development community. Technologies are nominated in open competition and judged by technical experts selected by the Illinois-based R&D Magazine. The magazine uses technical criteria to select the 100 most significant, unique, or promising entries from the nominations received. According to the selection panel, "The sole criterion for making the grade is demonstrable 'technological significance' compared with competing products and technologies. Issues such as smaller size, faster speed, greater efficiency, and higher environmental consciousness have continued to gain importance in successful award submissions."

Los Alamos has been competing successfully for more than two decades with many of its winning technologies developed in collaboration with private-sector companies and other scientific institutions. The Laboratory won five awards in 2004 and has received 94 awards since it began competing in 1978—more than any other national laboratory has received.

BeFinder: Rapid Assay for Beryllium Detection

Los Alamos National Laboratory
Mark McCleskey
Deborah Ehler
Galvin Collis
Edel Minogue
Anthony Burrell
Kevin John

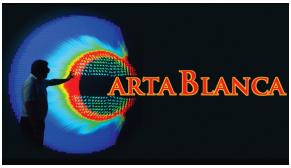
Berylliant Inc.
Anoop Agrawal

A 45-minute assay for the presence of beryllium, BeFinder provides an inexpensive and unambiguous method for assessing the health and safety risks to beryllium-industry workers and for protecting the public from exposure to this toxic metal. With chronic, degenerative lung disease the potential consequence of even a small exposure to beryllium particles, a fast, accurate detection assay is now available for industries that use beryllium in manufacturing—e.g., electronics, sporting goods, tools, jewelry, and dental crowns—as well as for companies or agencies that perform environmental testing of potentially contaminated sites. BeFinder provides a convenient, inexpensive, and highly portable method for frequent and reliable testing, promoting prompt remediation and preventive measures. BeFinder is being considered as a NIOSH and ASTM standard for beryllium screening.

Applications

Beryllium detection in the following situations:

- Sites contaminated by prior industrial use of beryllium or by illegal or inadvertent disposal of beryllium-containing waste
- Manufacturing environments: electronics, sporting goods, tools, jewelry, and dental apparatus
- Aerospace industry and other R&D environments in which beryllium and its alloys are used in development of new electrical and mechanical components
- DOE complex, where beryllium is widely used in weapons manufacture and maintenance



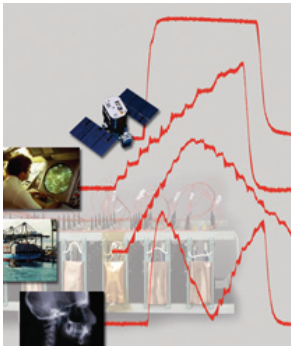
CartaBlanca: A High-Efficiency, Object-Oriented, General-Purpose Computer Simulation Environment

Los Alamos National Laboratory
Brian VanderHeyden
Nely Padial-Collins
Duan Z. Zhang
Qisu Zou
Giovani M. Lapenta
Stefano Markidis

CartaBlanca brings the tremendous efficiency of the Java programming language to the world of scientific computing. CartaBlanca is a state-of-the-art, object-oriented simulation software package poised to offer next-generation modeling and simulation capabilities to scientists in a number of disciplines. Written in the "developer friendly" Java language, it enables computer code developers to simulate complex nonlinear effects such as airflow through a turbo booster, blast effects on buildings, or heat transfer along a semiconductor. Because it is a Java-based software package, the code is much easier to use, manipulate, and modify than codes based on programming languages such as FORTRAN or C++. CartaBlanca takes advantage of the improved execution speed offered by the HotSpot™ compiler and opens up the field of physical modeling to a much broader set of programmers. CartaBlanca is modular and allows for rapid software application or simulation code prototyping; strong, extensive compiler checking; plug-and-play module insertion for modeling physical systems; solutions with consistent results; and integrated unit and regression testing.

Applications

- Aerospace engineering
- Animation and special effects
- Computational fluid dynamics
- Fluid/solid interactions
- Automotive design
- Weapon/target interactions
- Pharmaceutical processing
- Homeland defense



Diode-Directed Marx Modulator: A Pulsed-Power Source with Ground-Breaking Architecture

Los Alamos National Laboratory
Greg Dale
Hugh Kirbie
Willam B. Haynes
Cynthia E. Heath
Thomas A. Lopez
Frank P. Romero
Robert M. Wheat

A team of engineers at Los Alamos has developed a new type of solid-state Marx modulator with the demonstrated ability to control pulse width, duty factor, and wave shape from one pulse to the next. The team attained this result with a circuit architecture that significantly improves the fault tolerance, efficiency, and compactness of Marx-style modulators and combines it with precise process control. A Marx modulator with these capabilities opens the door to advanced applications ranging from health care to space vehicles to homeland defense, all in a package roughly 100 times lighter and smaller than a comparable device costing 10 times as much.

Applications

Our modulator will make possible smaller, lighter, less expensive, and more capable versions of products and devices and enable other, entirely new applications. Some examples:

- Defense—electronic warfare, nuclear stockpile maintenance
- Homeland security—portable inspection and decontamination machines
- Health and medicine—low-cost x-ray machines and water-treatment systems
- Aerospace—plasma generators to manage air flow or reduce radar reflectivity
- Industry—discharge reactors to improve energy efficiency and control pollution
- Micro power—essential power conditioning for advanced micro power sources

Los Alamos National Laboratory
Torsten Staab
John W. Jensen
Larry Bronisz
Gus W. Takala
Toshiyuki Shiina

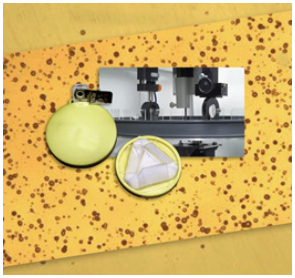
Polytechnic University
Corey Grimes

Hands-Off Sampler Gun: An Investigator's Best Friend

In recent years, high-visibility courtroom trials and television shows such as CSI (Crime Scene Investigation) have heightened public attention to sample collection and recordkeeping. Unfortunately, devices used to collect samples are often highly specialized, require separate procedures to use, and could expose an investigator to hazardous substances. Moreover, recordkeeping is usually done by hand, a time-consuming, error-prone process. The Hands-Off Sampler Gun overcomes these shortcomings. It comes with a universal adapter that can use virtually any type of sampling media, a hands-off loading/unloading mechanism that eliminates direct contact with a sample, and a built-in electronic data-acquisition system that eliminates manual recordkeeping. These features make the Sampler Gun an investigator's best friend.

Applications

- Environment/Ecology: Enables investigators and scientists to examine containers and drums; inspect food products; collect solid, liquid, and gas samples; map vegetation and track wildlife; and scrutinize archaeological and cultural sites.
- Forensics: Collects evidence for all types of suspected crimes, ranging from burglaries and narcotics trafficking to murders and arson.
- Homeland Security: Helps first responders assess threats involving radioactive, chemical, or biological agents.
- Inspections: Other potential users include healthcare providers, supply-chain safety assessors, pharmaceutical inspectors, and doping testers at sporting events.



LITES: A Laser Reader for Personal Neutron Dosimeters

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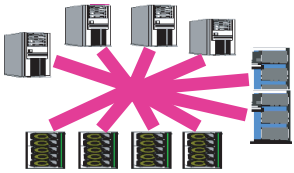
LITES measures the surface densities of microscopic "pits" chemically etched on the surfaces of clear-plastic dosimeter chips. During etching, a pit forms at the intersection of a neutron-produced "damage track" and a chip surface; the pit density is proportional to the neutron dose. Existing chip-reading methods count the pits one by one. In contrast, LITES measures the simultaneous, collective effect of the pits on a laser beam passing through a chip by measuring the intensity of the light scattered by the pits. LITES accurately reads neutron doses up to 5 rem for a 15-hour etch, meeting the DOE's requirement for neutron dosimetry, while conforming to the Los Alamos standard etch time. For a 6-hour etch, LITES accurately reads neutron doses up to 50 rem, making LITES useful for accident dosimetry as well as routine dosimetry. In addition to the applications cited below, LITES can be used to measure the amount of radon gas in a home from radon's alpha-particle emissions.

Applications

LITES can be used to measure the neutron exposure of

- workers at accelerator facilities;
- workers at facilities where weapons-grade plutonium is handled; and
- airline flight crews.



The Lustre File System Technology

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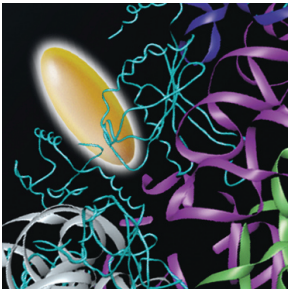
The Lustre project started three years ago as an exploration of object storage on the Linux platform. Lustre introduced an innovative object storage software stack that enables modular development of client/target networking, storage management, and file system modules to address High Performance Computing (HPC) requirements for scalable file management for the terascale Advanced Strategic Computing Initiative computing environment. The file management solution scales to tens of gigabytes/sec, tens of thousands of file operations/sec, management of tens of thousands of clients and thousands of storage devices, and dozens of metadata servers. Lustre is targeted for the extremely large-scale Linux Cluster Supercomputing environment. It has a networked environment with three types of systems: clients with access to the file system, object storage targets that control persistent storage but have extensive capabilities for "on-controller-processing," and cluster-control nodes that handle metadata updates and arbitrate file system security.

Applications

HP and Cray offer products that use this technology. An open source version is available from Cluster File Systems, a file systems technology company. The object file systems technology is applicable for

- high performance simulation,
- seismic,
- financial,
- genomic,
- intelligence,
- data warehousing,
- Web indexing, and
- other extremely large-scale computing applications.



Los Alamos
National Laboratory
George Havrilla

Caldera Pharmaceuticals, Inc.
Benjamin Warner

MESA: Measuring Enzyme-Substrate Affinities

MESA is a low-cost assay for detecting the binding of drugs to proteins (and other biomolecules and cell structures) without the biasing influence of added fluorescent molecular labels. The assay images drug-protein binding using atoms intrinsic to drug molecules themselves. Because of this label-free detection, MESA captures and quantitates all drug-protein binding, including potentially therapeutic and potentially toxic bindings. This allows MESA measurements to generate a complete therapeutic index early in the drug-development process. Today's high drug-development failure rate—the primary cause of the high cost of new drugs—is driven by the inability to measure more than an infinitesimal number of protein-drug interactions. MESA's ability to measure a very large number of these interactions and its resulting early detection of toxicity could save hundreds of millions of dollars in drug-development costs.

Applications

- Drug Development: Screens label-free drugs against all body proteins in 24–72 hours, compared with extant technologies that test drug effects on less than 0.5% of body proteins.
- Personalized Medicine: Allows screening of individual patients for potential drug responses, enhancing drug prescribing and reducing adverse reactions.
- Target Validation: Facilitates identification of new protein targets for drug therapies, a necessity for treating currently intractable or incurable diseases.
- Label-Free Accuracy: Provides far more accurate data than that obtained with fluorescently labeled molecules.

Mobile and Modular Nuclear Facilities

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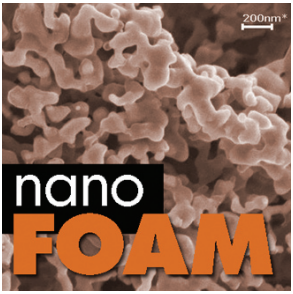
In the United States, there are more than 100 nuclear facilities whose combined acreage is equivalent to the size of Rhode Island and Delaware combined. Many facilities have thousands of metric tons and millions of liters of various nuclear material wastes, as well as contaminated tools and clothing, metal scrap, solvents, and other waste. Unfortunately, no infrastructure exists for characterizing, treating, and packaging these wastes. The traditional solution to this problem has been to construct waste-handling facilities on site, but such facilities are expensive to build, only to be torn down once their mission is complete. To address this problem, Los Alamos has developed a mobile and modular transportainer that meets stringent safety and security requirements stipulated by the DOE. This portable and self-contained "trailer" can be customized to carry the equipment and resources necessary to characterize, treat, and package waste or perform other nuclear operations.

Applications

These facilities can be used to

- House operations related to nuclear processes, waste characterization, treatment, and packaging.
- Protect the public and the environment by containing hazardous cleanup operations.
- Serve as command and operation centers for nuclear, chemical, biological, and forensics investigations related to natural disasters, accidents, or terrorist acts.



Los Alamos National Laboratory
Bryce C. Tappan
My Hang Huynh
Steven F. Son
Michael A. Hiskey
David E. Chavez
David M. Oschwald

nanoFOAM: A Metal-Nanofoam Fabrication Technique

We developed the nanoFOAM technique to produce self-supporting, nanoporous metal foams by igniting a pressed pellet of a special compound in an inert atmosphere. The compounds are high-nitrogen transition-metal complexes synthesized with a low-cost, high-volume method that we developed. Nanofoams produced to date include iron, cobalt, copper, and silver. The nanofoams have pore diameters of 20 nanometers to 1 micrometer, surface areas as high as 258 meters-squared per gram, and densities as low as 0.01 gram per cubic centimeter. These values compare favorably with those of silica aerogels, the lightest known solids.

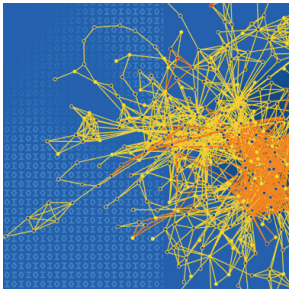
Applications

Nanofoams could be used to improve the efficiencies of

- the catalytic production of ammonia, sulfuric acid, fuels, plastics, and other chemicals and products;
- oil-refining processes and electrical generation from fuel cells that run on hydrocarbons; and
- silver biocidal filters that destroy liquid or airborne germs on contact.

Nanofoams could also be used to

- improve the strength and heat-transfer properties of jet-turbine blades while decreasing their weight;
- reduce emissions of nitrogen oxides from internal combustion engines and coal-fired power plants;
- remediate chlorohydrocarbons in the environment; and
- enhance the sensitivity of biomedical detectors.



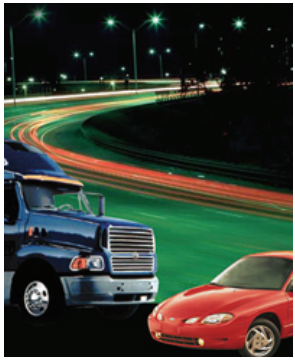
Los Alamos
National Laboratory
Christian Forst
Electra Sutton
Lawrence Cabusora

Network Express: Software for Modeling Systems Properties of Biological Response Networks

Network Express models the interdependent genetic, metabolic, and signaling processes of biological response networks for systems-level analyses of cellular responses to external stimuli. Representative stimuli include drugs, radiation, allergens, toxins, microorganisms, and other agents involved in inflammation. Both experimental data and metabolic/genetic information are used to generate the networks, which are refined through computational optimization. This predictive tool provides graphical output for precise description of network responses. It has demonstrated the capability for subtle discrimination among responses to apparently similar drugs and has been used to model human signaling networks as well as ecological and agricultural networks.

Applications

- Biological Target Identification: Identifies key network genes and proteins in a biological response, accurately targeting them for therapeutic intervention.
- Drug Discovery: Yields precise drug comparisons and guides drug development by identifying "copycat" drugs and unanticipated side effects.
- Personalized Health Care: Evaluates the most beneficial therapeutic regimen on a patient-specific basis.
- Environmental Remediation: Accurately models ecological networks involved in fundamental ecosystem processes.
- Agricultural Pest Management: Models interactions between plants and plant pests, identifying the most-effective points for intervention.



Los Alamos National Laboratory
Kevin Ott

NO_X HyCat: A New Catalytic System for Diesel Engines

No catalytic system has yet been commercialized that can eliminate nitrogen oxides (NO_X) from the exhaust of vehicles powered by diesel and other lean-burn engines. The problem is temperature: a successful system must operate over the full range of temperatures found in vehicle exhaust: 150°C to more than 500°C, the low temperatures being the most problematic. Our NO_X HyCat is the first catalytic system to span that temperature range. The system includes a brand-new, iron-containing, zeolite catalyst that is augmented with cerium-manganese oxide, an oxidizer that produces a near-optimum ratio of NO_X components to speed up the catalytic reaction and enable the zeolite to operate efficiently as a low-temperature catalyst. We combine this new low-temperature catalyst with a conventional high-temperature catalyst in a "dual-bed" configuration that provides high rates of NO_X conversion over the broadest temperature range ever achieved. It operates efficiently from 113°C to as high as 600°C, includes no expensive precious metals, requires no complex engine controls, and is compatible with existing manufacturing techniques.

Applications

The NO_X HyCat is the first NO_X-reduction system for diesel engines that can be used in vehicles such as

- sedans,
- vans,
- SUVs,
- light and heavy trucks, and even
- locomotives.

Los Alamos
National Laboratory
Benjamin Warner

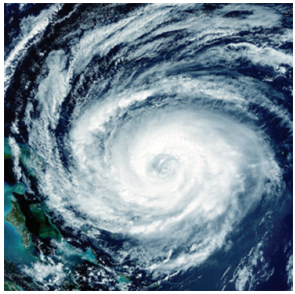
ElectroChromiX, Inc.
Gordon Goodyear

Reversible Electrotint Windows

Most office buildings are literally made up of windows—for example, the Sears Tower in Chicago has 16,000. During spring and summer, the heat from sunlight, coupled with the heat from people, lights, computers, and other equipment, often means that buildings must run air conditioning until the outside temperature falls to freezing. Permanently tinting the windows presents a different problem during the fall and winter when sunlight helps keep buildings warm. To address these problems, we have developed windows that can quickly go from a colorless to a deeply colored—or mirrored—state and back again. Our windows let in 75% of visible light during fall and winter and block 90% of light during spring and summer.

Applications

- Energy-efficient building windows—DOE estimates that optimizing heat gains and losses through architectural windows and enhancing the use of daylight can save the United States 5% in energy consumption annually.
- Rear- and side-view automotive mirrors—For this market, our technology eliminates headlight glare, thereby reducing automotive accidents. Unlike conventional electrochromic mirrors, our Electrotint mirrors are more stable in sunlight. The present market for rear- and side-view mirrors is estimated to be worth $550 million and growing at 20% per year.



Los Alamos National Laboratory
Loren Toole
Fred Roach
Thomas Riggs
Mihaela Quirk
Steve Linger

Scenario Library Visualizer: The Calm during the Storm

On September 24, 2004, Hurricane Jeanne struck the Florida coast, knocking out electricity to more than 1.7 million homes, businesses, and institutions. In just eight days, first responders restored power, thanks in part to the Scenario Library Visualizer (SLV). SLV is a software package that consists of a catalog of presolved scenarios that a user can modify electronically to analyze and visualize electrical blackouts during an unfolding natural disaster, such as a hurricane or tsunami, or a manmade catastrophe, such as an industrial accident or terrorist attack. Based on such predictions, first responders can restore power quickly to the neediest areas. SLV generates results within four hours. Moreover, SLV provides decision makers and concerned citizens detailed information about power availability and schedule restoration. SLV runs on medium-performance laptops preferred by first responders and requires minimal training to use.

Applications

- Predicts damage to electrical infrastructures, thus enabling first responders to restore power quickly.
- Helps planners, such as the Federal Emergency Management Agency and the Department of Homeland Security, create and evaluate emergency response plans and contingency action plans.
- Can be used to assist in the training of first responders, as well as local, state, and national decision makers.

Los Alamos National Laboratory
Lakshman Prasad
Alexei N. Skourikhine
Ramana L. Rao

VICTOR: A New Paradigm for Artificial Visual Perception

VICTOR (Vectorized Image Characterization by Triangulation, and Object Reconstruction) is a software package that provides a versatile and comprehensive computational framework for developing new algorithms for artificial visual perception. Using principles from cognitive psychology to emulate human visual perception, VICTOR recognizes objects with complex shapes, regardless of orientation or apparent size, as well as objects with moving parts. VICTOR performs many object-recognition tasks now performed by humans. To recognize an object, VICTOR converts a pixel image to a high-quality vector image, typically reducing the size of a JPEG image by a factor of about four and the sizes of other image types even more. Image compression can be performed independently of object recognition and is fast enough for real-time video applications. VICTOR's modular structure can accommodate a wide range of existing algorithms used for artificial visual perception as well as algorithms to be developed in the future.

Applications

- Reducing digital-image storage requirements
- Analyzing x- or gamma-ray images of cargo containers
- Analyzing medical x-rays, dental photos, or satellite-reconnaissance photos
- Helping robotic vehicles navigate
- Helping military robotic vehicles identify targets
- Rendering 3D objects from freehand 2D sketches
- Enabling visual-object search engines
- Developing algorithms for image understanding and machine vision

Los Alamos National Laboratory R&D 100 Award Winners 1978–2004

1978
- Diamond Machining of Optics
- Electronic Identification System
- Electronic Device for Treating Tumors—Hyper Thermic Cancer Treatment

1980
- Wee Pocket Radiation Detector
- Portable Multichannel Analyzer

1981
- Radio Frequency Quadrapole Linac

1982
- WC Field Computer System

1983
- Transuranic Waste Assay System

1984
- Superconducting Magnetic Energy System

1985
- BHTP—A Unique Scintillation Compound

1986
- Aurora Laser Beam Alignment System

1988
- Optical Microrobot Single-Cell Manipulator/Analysis System
- Nuclear Material Solution Assay System
- 32-Stepper Motor Position Controller
- Mobile Beryllium Monitor
- HTMS Reference Electrode
- Oriented, Highly Anisotropic Conducting Polymer
- Photoinjector for RF Linac Accelerators
- Lattice Gas Algorithm

1989
- Fourier Transform Flow Cytometer
- Noncontact Superconductor Screening
- Conductive Lattices

1990
- Coolahoop
- Universal Process for Fingerprint Detection
- Fast Agarose Gel Electrophoresis (FAGE)
- Solid-State NO_2 Sensor
- Upconversion Solid-State Laser
- A Broadband (ABB) Mw Absorption Spectrometer for Liquid Media
- MdS_2/SC Composites (Molybdenum Disilicide/Silicon Carbide)

1991
- Semi-Insulator Detector
- Optical High-Acidity Detector
- Resonant Ultrasonic Inspection (RUI)
- Single Molecule Detector

1992
- Thermal Neutron Multiplicity Counter
- Plastic Laser Dye Rods
- Cryogenic Diamond Turning
- Portable Laser Spark Surface Mass Analyzer (PLASSMA)
- Zeeman Refractive Index Detector
- Animated Display of Inferred Tongue, Lip, and Jaw Movements During Speech

1993
- Selenium-Based Reagents for the Evaluation of Chiral Molecules
- Phase-Sensitive Flow Cytometry
- Ultrafast Infrared Spectrometer
- Mini Elastic Backscatter Lidar

1994
- Ultrasensitive Ultrasonic Transducer
- Telemetric Heat Stress Monitor
- Optical Biopsy System
- Lattice Boltzmann Permeameter
- Directed Light Fabrication of Complex Metal Parts
- Bartas Iris Identification

1995
- The Indigo-830
- ARS Chemical Fill Detector
- Hydride-Dehydride Recycle Process
- HIPPI-SONET Gateway
- Microsensor for VOCs
- Polymer Filtration System

1996
- TRACER (Transportable Remote Analyzer for Characterization & Environmental Remediation)
- PLASMAX (Plasma Mechanical Cleaner for Silicon Wafers)

1997
- Falcon: Breakthrough Software for Simulating Oil Reservoirs
- Rapid Size Analysis of Individual DNA Fragments
- ASR Detect—Diagnostic Method for Analyzing Degrading Concrete
- Dry Wash
- Plasma Source Ion Implantation for Enhancing Materials Surfaces
- High Performance Storage

1998
- Cyrax™—Portable, 3D Laser-Mapping and Imaging System
- Low-Smoke Pyrotechnics
- SOLVE—Creating 3D Pictures of Protein Molecules from X-Ray Diffraction Spots
- Underground Radio

1999
- Acoustic Stirling Heat Engine
- Atmospheric Pressure Plasma Jet
- CHEMIN: A Miniaturized X-Ray Diffraction and X-Ray Fluorescence Instrument
- PREDICT—A New Approach to Process Development
- Real-Time, Puncture-Detecting, Self-Healing Materials

- REED-MD: A Computer Code for Predicting Dopant Density Profiles in Semiconductor Materials
- The Sulfur Resistant Oxymitter 4000™

2000
- ANDE: Advanced Nondestructive Evaluation System
- Electroexploded Metal Nanoparticles

2001
- Free-Space Quantum Cryptography
- SCORR—Supercritical CO_2 Resist Remover
- Tandem-Configured Solid-State Optical Limiter

2002
- GENIE: Evolving Feature-Extraction Algorithms for Image Analysis
- HDF5 – Hierarchical Data Format

2003
- CARISS: Integrated Elemental and Compositional Analysis
- BASIS: High-Confidence Biothreat Detection and Characterization
- FIRETEC: A Physics-Based Wildfire Model
- Flexible Superconducting Tape
- FlashCT™
- Green Destiny
- PowerFactoRE: A Suite of Reliability Engineering Tools for Optimizing the Manufacturing Process
- Super-Thermite Electric Matches

2004
- Clustermatic
- Confocal X-Ray Fluorescence Microscope
- mpiBLAST: A High-Speed Software Catalyst for Genetic Research
- Plasma-Torch Production of Spherical Boron Nitride Particles
- 10-Gigabit Ethernet Adapter: Speed Really Changes Everything

R&D 100 Awards Sponsorship

The Technology Transfer (TT) Division serves as the link for technology transfer and Laboratory collaborations with private industry, universities, government agencies, and other national laboratories. TT matches Laboratory scientific and technical talent, expertise, and facilities with research and development endeavors in external sectors for the advancement of national security, technological innovation, and economic competitiveness.

As part of our commitment to the transfer of technology beyond the Laboratory, TT coordinates Laboratory participation in the annual R&D 100 Awards competition. In collaboration with technical staff and a dedicated, professional publications team from the Information Management Division, TT submits the Laboratory's most innovative technologies to the R&D 100 review panel.

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For information about TT, visit us on the Web at: http://www.lanl.gov/partnerships