



The World's Greatest Science
Protecting America

R&D 100 2005 Call for Submissions

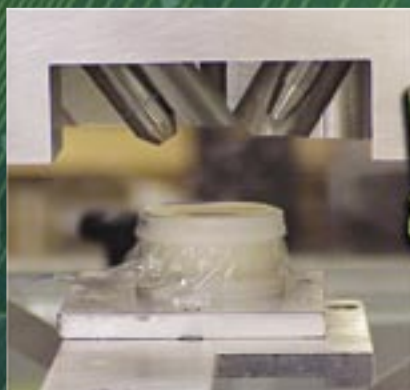
Five winners in 2004

Los Alamos National Laboratory congratulates everyone who participated in this year's R&D 100 Awards competition. For us, each and every Laboratory entry is a winner for Los Alamos. The creativity and technical expertise demonstrated by all of these innovations illustrate why we continue to play a leading role in the worldwide scientific community. These projects represent the scientific talent and commitment of our work force and the tremendous range of ability and talent available at the Laboratory!

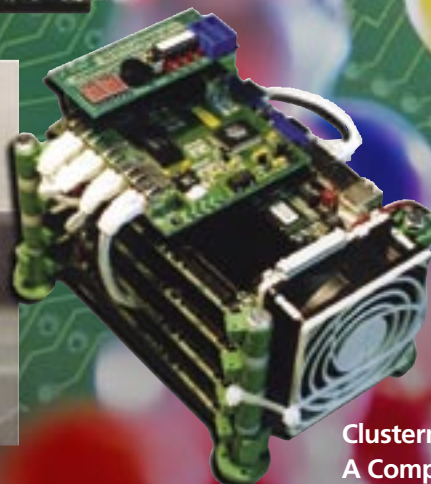


Plasma-Torch
Production of
Spherical Boron
Nitride Particles

10-Gigabit
Ethernet Adapter



Confocal X-ray
Fluorescence
Microscope



Clustermatic—
A Complete Cluster
Management
Software Solution

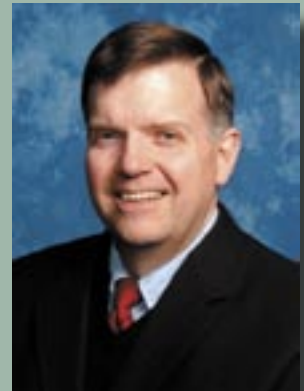
Background:
mpiBLAST—
A High-Speed
Software Catalyst
for Genetic
Research



Los Alamos National Laboratory

R&D 100 2005 Call for Submissions

In congratulating the Laboratory's five 2004 R&D 100 Award winners, Director Nanos noted that all who submitted projects to the selection committee "exemplify the talent and commitment of our work force and the tremendous range of ability and knowledge found here. While five of our 14 proposals were chosen for the award, to me each and every one of them is a winner. The creativity and technical expertise demonstrated by all of these innovations illustrate why this Laboratory plays the leading role that it does in our nation's defense. These awards demonstrate once again that Los Alamos is home to innovation and great science."



"The recognition the Laboratory receives from venues like the R&D 100 Awards' competition is crucial for reminding the nation and the world that we do great science here and we are leaders in making cutting-edge discoveries that benefit society."

—Donna Smith, Technology Transfer Division Leader

What is the R&D 100 Competition?

Since 1963, R&D Magazine has conducted an annual competition to select the 100 most innovative products, materials, processes, software, and systems of the previous year for its prestigious R&D 100 Awards. Winning innovations are selected on the basis of their technical importance and usefulness. Judges for the competition include a panel of 50 outside technical experts and the editors of *R&D Magazine*.

An international competition, the R&D 100 Award is regarded as a benchmark for excellence by both industry and government. The Lab's winning record over the last 17 years is impressive. Since 1978, Los Alamos National Laboratory technologies have won 94 awards. While the Laboratory is extremely proud of its winners, it is proud of all participants who qualify to compete. The Laboratory Director annually hosts a recognition ceremony at the Bradbury Science Museum to honor all participants. The Laboratory's winning teams attend *R&D Magazine's* Awards Banquet held in Chicago in October at the Navy Pier Conference Center.

Why should I enter my technology?

Entering the competition is an excellent way to increase staff and program recognition for a technology and an inventor. DOE has publicly commended the R&D 100 winners from its laboratories for their innovative research. In addition, the Laboratory's Science and Technology Base Program Office will award \$50,000 to fund the future development of the winning technologies.

What can I enter?

Any new product, process, material, software, or system that has shown demonstrable technological significance compared with competing products during the 2004 calendar year is eligible for the 2005 competition. Previously submitted technologies that can claim a significant advance or partnership development in 2004 may qualify for **resubmission**. "Proof of concept" models are viewed skeptically by the judges and should not be entered until they are developed to a more advanced stage.

Participation Schedule:

- **Kickoff Meetings**
September 14, 2004
11:00 a.m.
TT Pecos Room
- **September 21, 2004**
10:00 a.m.
TT Pecos Room
- **Electronic entry form due**
October 8, 2004
- **R&D Review Committee Interviews**
October 2004
- **Draft material submitted to IM-1**
December 22, 2004
- **Entry submittal to R&D Magazine**
March 1, 2005
- **Director-Hosted Recognition Ceremony at the Bradbury Science Museum**
May 2005
- **Announcement of Winners**
July 1, 2005

Who can help me with the submission process?

The Technology Transfer (TT) Division coordinates the Laboratory's participation in the competition. *R&D Magazine* and its readers are especially interested in the market or societal impact of the innovative technologies submitted. TT can help potential participants determine a fair market value as well as the intellectual property status of a proposed technology.

Editors and designers on the Information Management R&D 100 production team work with entrants to build compelling arguments for the importance and usefulness of their innovations and to create striking supporting graphics. All Lab entries have a common graphics format, coordinated by the Lab's R&D 100 production team. The team sees that entries reach Chicago by the March 2005 deadline.

For information about entry development, contact TT Coordinator Cindy Boone at 667-1229, boone@lanl.gov; IM-1 writer-editor Eileen Patterson at 665-8377, epatterson@lanl.gov; or IM-1 designer Chris Brigman at 667-0862, cbrigman@lanl.gov.

How does the Laboratory benefit?

Participation in the R&D 100 competition is a perfect opportunity for us to showcase the Laboratory's contributions to U.S. industrial competitiveness. R&D 100 Award winners enhance the Lab's image as a leader in technological innovation and help create new opportunities to build our intellectual property portfolios. These portfolios enable us to share our resources with society and create new opportunities to transfer our knowledge through licenses and spinoff technologies and to enhance our research base.

In 2003 and 2004 LANL was awarded 13 winners—more than any other lab or company in the competition. Since the mid 1990s, winning innovations have returned more than \$30 million in funding to LANL in the form of cooperative research and development agreements (CRADAs), licenses, Work for Others, and User Facility Agreements. More than 80 patent awards have been associated with R&D 100 winners and an additional 40 patents are pending. Forty-five

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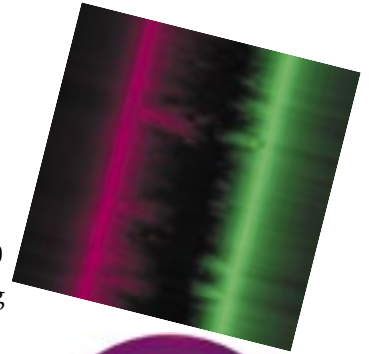
of LANL's 180 active commercial licenses are R&D 100 winners, while more than 400 of the Laboratory's 650 active non-commercial licenses are associated with winners. Twenty-three of the active 180 commercial licenses are associated with non-winning R&D 100 submissions. Nearly half of LANL's more than \$8 million (cumulative) license and royalty income is from R&D 100 winners, with an additional \$1.7 million accruing from non-winning submissions.

How do I enter?

Potential participants should follow these steps:

1. Attend one of the two **kickoff meetings** that will be held in September (see sidebar opposite page). These one-hour meetings will cover the nature of the award, this year's schedule, and entry requirements. Individuals or teams must interview with the R&D 100 review committee to determine appropriateness of a technology for the competition and to discuss eligibility requirements and the best way to present innovations in terms of the judging criteria.
2. Decide to pursue entry in the 2005 competition.
3. Fill out the R&D 100 electronic entry form found at <http://www.lanl.gov/partnerships/rd100/form04.pdf>. Fax, mail, or e-mail your entry form by October 8, 2004, to Cindy Boone at 665-3125, MS C333, or boone@lanl.gov.
4. Set up an interview with the R&D 100 review committee by contacting Carole Travis at 665-6756 or ctravis@lanl.gov.
5. During November and December work with members of the R&D 100 production team to develop a draft submission.

For general questions about the competition contact Cindy Boone at 667-1229, or boone@lanl.gov.



Graphics from 2004 submissions

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**TT R&D 100 Awards
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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 Quadrupole 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 (FTCS-1)
 - Noncontact Superconductor Screening
 - Conductive Lattices
- 1990 • Coolahoop
 - Universal Process for Fingerprint Detection
 - Fast Agarose Gel Electrophoresis (FAGE)
 - Solid-State NO₂ Sensor
 - Upconversion Solid-State Laser
 - A Broadband (ABB) Mw Absorption Spectrometer for Liquid Media
 - MdS₂/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, 3-D Laser-Mapping and Imaging System
 - Low-Smoke Pyrotechnics
 - SOLVE—Creating 3-D 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 CO₂ 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: A Complete Cluster Management Software Solution
 - 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