R&D 100 Winners for 2024 are announced

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By Paul Heney

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Janelle Droessler applies MENDS' flat surface attachment to europium-treated stainless steel. The europium oxide was used as a non-radiological and visual surrogate that fluoresces to demonstrate the effectiveness of MENDS' removal of surface contamination.

The official 2024 R&D 100 Awards have been announced by *R&D World*. This renowned worldwide science and innovation competition, celebrating its 62nd year, received entries from 16 different countries and regions. This year's esteemed judging panel included 56 well-respected industry professionals from across the world.

The Winners are listed below by category, and then alphabetically by submission name, and include primary submitting organizations and then co-developing organizations, as provided to *R&D World*.

Analytical/Test category

Automated digital slide scanner, MSP® 320
Curiosis Inc.

Autonomous Electron Microscope (AutoEM)
Pacific Northwest National Laboratory

Autonomous Sparse-Aperture Multibeam Echo Sounder
MIT Lincoln Laboratory
MIT

AXES: The Complete Advanced X-ray Emission Spectrometry Solution
Argonne National Laboratory

Compact Space Plasma Analyzer
Los Alamos National Laboratory
United States Air Force Academy, i2 Strategic Services, LLC

ENFINIA™ DNA
Elegen Corp.

GEM Premier 7000 with iQM3
Werfen

LiteScope 2.5 — the cutting-edge of AFM-in-SEM technology
NenoVision s.r.o.
Czech Metrology Institute

MAVERICK
908 Devices

PHOENIX (Portable, High-efficiency, Orthovoltage ENergy, Imaging X-rays)
Los Alamos National Laboratory
Golden Engineering

Pixel
CytoTronics Inc.

QUIC-DEPDOSE: Software tools to prepare for and respond to nuclear emergencies
Los Alamos National Laboratory=

Scintillation Hydrogel for Isotopic Neutron Emitters (SHINE)
Idaho National Laboratory

Thermo Scientific™ Orbitrap™ Astral™ mass spectrometer
Thermo Fisher Scientific

Tunable Knitted Stem Cell Scaffolds
MIT Lincoln Laboratory
MIT Department of Mechanical Engineering

Vero AFM
Oxford Instruments Asylum Research, Inc.
Université de Lyon

IT/Electrical category

Aircore EC Motor for Data Centers
Infinitum

Ameba RAN for NTN/TN convergence network
Industrial Technology Research Institute (ITRI)
MediaTek Inc., Wiwynn Inc., Alpha Inc., Chunghwa Telecom Laboratories

Berxel iHawk P100 Polarization Structured Light Camera
Berxel Photonics Co., Ltd.

Compact and Lightweight Polyphase Extreme Fast Wireless Charging System
Oak Ridge National Laboratory
Volkswagen Group of America, Volkswagen Group Innovation, Volkswagen Group
Components, Hyundai-Kia North America Technical Center

Electromagnetic Spectrum Management System
Nevada National Security Sites

Electrooculography and Balance Blast Overpressure Monitoring System (EYEBOOM)
MIT Lincoln Laboratory
Creare LLC, Lifelens LLC

Frontier-X
Johns Hopkins Applied Physics Laboratory
Rocket Lab USA

Full-Duplex Wireless System with Advanced Interference Mitigation
MIT Lincoln Laboratory
Kumu Networks

Heat Injury Prevention System
MIT Lincoln Laboratory
US Army Medical Material Development Activity, US Army Research Institute of
Environmental Medicine, General Dynamics Information Technology Inc., Odic Inc.

Ion Pair™ Membrane Electrode Assemblies
Los Alamos National Laboratory
Advent Technologies Holdings, Inc.

MOSAIC, Memory-cube Operability in a Stacked AI Chip for Generative AI
Industrial Technology Research Institute (ITRI)
Powerchip Semiconductor Manufacturing Corporation (PSMC)

Nanocrystalline Axial Flux Electric Motor
CorePower Magnetics
Carnegie Mellon University

PADWOS (Portable Aircraft Derived Weather Observation System)
MIT Lincoln Laboratory

Precision Photon Synchronization System for Quantum Networking
MIT Lincoln Laboratory

SAFE: Secure Automatic Failsafe Eraser
Los Alamos National Laboratory

Superconductive Many-State Memory and Comparison Logic
MIT Lincoln Laboratory

Traffic Violation Catcher
Institute for Information Industry

TRIPWIRE
Idaho National Laboratory

UltraSonic Photonics
University of Pittsburgh
National Energy Technology Laboratory, Sensible Photonics

Mechanical/Materials category

Agilely Adoptable Demand Responsive Energy Management System (AADREMS)
Industrial Technology Research Institute (ITRI)

AI-LCGC, AI Formulated Low Carbon Geopolymer Concrete
Industrial Technology Research Institute (ITRI)

Axalta Primerless Consolidated Coating Process
Axalta Coating Systems

Battery Recycling and Water Splitting (BRAWS) Technology
Ames National Laboratory
Iowa State University

Berelex Green
Pinturas Berel S.A de C.V.

BETAFORCETM elastic structural adhesive
DuPont

Broad PANGUJIE filler wire
Shanghai Institute of Optics and Fine Mechanics

CO2-Fixing Polycarbonate
CHIMEI Corporation
Industrial Technology Research Institute (ITRI)

Dow AXELERON™ 6321 BK; Prysmian Sirocco Microduct Cables
Dow Packaging & Specialty Plastics
Prysmian

DOWSIL™ 2080 Resin
Dow (Shanghai) Holding Co., Ltd.

DOWSIL™ IE-9100 Emulsion
Dow Performance Silicones, division of The Dow Chemical Company (Dow Inc.)

Gibco™ CTS™ Detachable Dynabeads™
Thermo Fisher Scientific

High-Efficiency Micro Combined Heat and Power Device
Oak Ridge National Laboratory
Enginuity Power Systems (EPS)

Inexpensive Electrode for Selenium-Laden Wastewater Treatment
Lawrence Berkeley National Laboratory

PARALOID™ Additives
The Dow Chemical Company

Polartec® Power Shield™ Pro
Milliken & Company

SABIC's LNP™ STAT-KON™ High Electrically Conductive Compound
SABIC's Specialties Business

Transparent Sun Nanocurtain
Nano and Advanced Materials Institute
Harvest Time Facade Limited

Tyvek® Trifecta™ A2 Breather Membrane
DuPont de Nemours, Inc.
Lenzing Plastics GmbH & Co KG (Austria)

Other category

InertiaMeter: Cost-Effective Real-Time Power System Inertia Monitor
Oak Ridge National Laboratory
The University of Tennessee, Knoxville

Onso short-read sequencing system
PacBio

Process/Prototyping category

AI self-learning Fabric Inspecting System
Taiwan Textile Research Institute (TTRI)
AI Machinevision Corp.

APEX CDR
Oak Ridge National Laboratory (ORNL)
Holocene Climate Corporation

Bionic Mono-Material Leather
Taiwan Textile Research Institute (TTRI)
TSRC Corp.

Direct Lithium Extraction Sorbents
Oak Ridge National Laboratory (ORNL)
Element3 Mineral Selective Technologies, Natural History Museum of Los Angeles County

Direct Recycling and Remanufacturing of Li-Ion Battery Electrode Scraps
Oak Ridge National Laboratory
Appalachian Renewal Technologies

Direct recycling process for lithium-ion battery cells
Argonne National Laboratory

EHE Combustion System
Metal Industries Research & Development Centre (MIRDC)

Engineered Substrates for Rapid Advanced Imaging Sensor Development
MIT Lincoln Laboratory

EPi-Sense® ST System
Spectrum Plastics Group: A DuPont Business
AtriCure

EXUDE Elite Spectral Beam Combining Optic
Lawrence Livermore National Laboratory

Hydro4Crystal
Argonne National Laboratory
ACT-ion Battery Technologies

In-Line X-Ray Critical Dimension Metrology System (XRCD)
NanoSeeX Co., Ltd.
Industrial Technology Research Institute (ITRI)

Low-cost Direct Air Capture of CO2 with Clay Nanointerlayers (LDAC3)
Sandia National Laboratories
Purdue University

Low-Temperature Additive Manufacturing of Glass Composites
MIT Lincoln Laboratory

Lysol Air Sanitizer
Reckitt Benckiser Group

Machinable, Larger-Scale, Self-Healing RHEAs for Energy and Aerospace Applications
Sandia National Laboratories
Pennsylvania State, Dynetics, and the University of New Mexico

MBE-DAC: Multifunctional Building Equipment for Direct Air Capture
Oak Ridge National Laboratory

MedUSA: Large-Scale Multiagent Wire-Arc Additive Manufacturing
Oak Ridge National Laboratory (ORNL)
Lincoln Electric

Megachips: Extremely Large-Area Integrated Circuits Constructed from Chiplets
MIT Lincoln Laboratory

Modular Electrochemical Nuclear Decontamination System (MENDS)
Los Alamos National Laboratory

Mushroom Leather Cultivates System
Taiwan Textile Research Institute (TTRI)

Nanocomposite Inks for 3D Printing Radio-Frequency Devices and Radiation Shielding
MIT Lincoln Laboratory
Harvard University

Plant Multigene Engineering System
Oak Ridge National Laboratory (ORNL)

Plastic Recycler Catalyst
Oak Ridge National Laboraory
Re-Du

Rapid thermal processing of solid-state lithium battery ceramic electrolyte materials
Argonne National Laboratory
PulseForge Inc.

Real-Time Evaluator for Fast and Accurate Installation of Prefabricated Components
Oak Ridge National Laboratory

Thiozen Hydrogen cycle
Thiozen Inc.

Ultra-Fast Selective Delamination (UFSD) of LIB Electrodes
Argonne National Laboratory

Software/Services category

AI-driven Self-Navigating Miniature Serpentine Robotic System for Natural Orifice Transluminal Endoscopic Surgery, AiSNMSR
Industrial Technology Research Institute (ITRI)

Digital Twin System for Tapping Process, DiTwS-TP
China Steel Corporation (CSC)
Industrial Technology Research Institute (ITRI)

EGRASS
Pacific Northwest National Laboratory (PNNL)

Fierro Computational Mechanics and Materials Science Software
Los Alamos National Laboratory

FocusNet
MIT Lincoln Laboratory

gpCAM
Lawrence Berkeley National Laboratory

iMat for Smart Care
Institute for Information Industry
Humetrics Inc., YungShin Social Welfare Foundation, Compal Electronics, Inc.

IRIS-SDK: Intelligent Runtime System for Extremely Heterogeneous Computer Architectures
Oak Ridge National Laboratory

Lagrangian-Eulerian Spark-Ignition (LESI) Model
Argonne National Laboratory

MAQ: Machine Learning on Adiabatic Quantum Computers
Oak Ridge National Laboratory

Mixture deconvolution pipeline for forensic investigative genetic genealogy
MIT Lincoln Laboratory

NDα: Nondestructive Alpha Spectrometer
Los Alamos National Laboratory

Neuron Tracing and Active Learning Environment
MIT Lincoln Laboratory
Massachusetts Institute of Technology

Real-time Advanced Imaging Technology
Pacific Northwest National Laboratory
U.S. Department of Homeland Security Science & Technology Directorate

UMap
Lawrence Livermore National Laboratory

UnifyFS
Lawrence Livermore National Laboratory
Oak Ridge National Laboratory National Center for Supercomputing Applications, University of Illinois

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The 2024 R&D 100 gala banquet will be held in Palm Desert (near Palm Springs), California on November 21st. Details can be found here. **All Finalist, Winner, and additional logos are available for download here.**

A sincere congratulations from our whole staff to all of the Finalists, Winners, Special Recognition winners, and Professional Awards winners. We look forward to seeing you in California in November!