Pacific Northwest National Laboratory

Control of Chemical Transformations for a Secure Energy Future

▶ **In the physical and engineering sciences pertinent to chemical catalysis, Pacific Northwest National Laboratory has more than 1300 years of experience among our 90 staff members.**

U.S. DEPARTMENT OF ENERGY

Pacific Northwest National Laboratory:

INSTITUTE FOR INTERFACIAL CATALYSIS

Scientific Leadership

Catalysis lies at the heart of efficient and effective chemical transformations for manufacturing products and producing energy, while reducing environmental impacts. Innovative scientists and engineers at Pacific Northwest National Laboratory's (PNNL's) Institute for Interfacial Catalysis are taking advantage of new capabilities to control, measure and compute chemical and physical properties with exquisite spatial and temporal resolution.

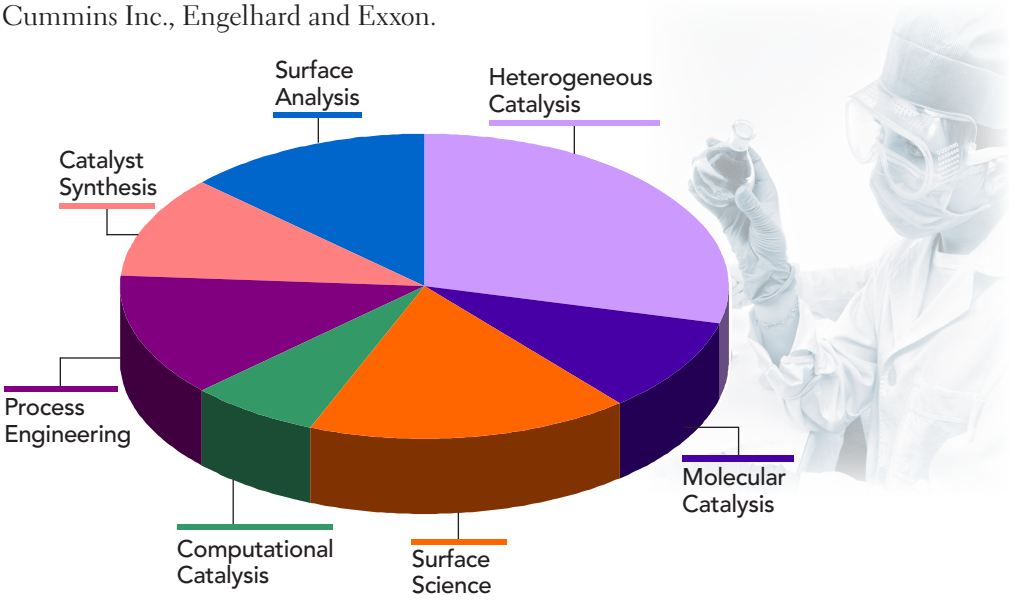
With these capabilities, we provide a fundamental understanding of catalytic materials and the chemical reactions occurring on catalysts surfaces. We apply this understanding to developing industrial and environmental solutions for private and government agencies.

TECHNICAL EXPERTISE

Ninety staff members at PNNL contribute to our broad scope of catalysis research programs—from reaction engineering and process development to electronic structure theory. With years of experience from 1 to 40, and an average of 14, our staff provide a critical mass for innovation.

Typically, problems in catalysis are complex and can only be solved by bringing together a critical mass of multidisciplinary capabilities. We provide expertise in a broad range of disciplines: chemical engineering, inorganic and organic chemistry, physics, materials science, radiation chemistry, chemical physics, geochemistry and computational modeling. We add to this expertise with researchers from fields as diverse as economics and environmental remediation. That is the hallmark of our research endeavor.

We collaborate extensively with researchers around the globe. We build synergistic teams that bring our experience and expertise together with complementary resources from other organizations, including national laboratories, universities and industry. Our staff includes members with considerable industrial experience at companies such as Corning, Akzo-Nobel, BP/Amoco, Catalytica Energy Systems, Cummins Inc., Engelhard and Exxon.



In the catalysis-related physical and engineering sciences, the Institute for Interfacial Catalysis has a critical mass of staff expertise.

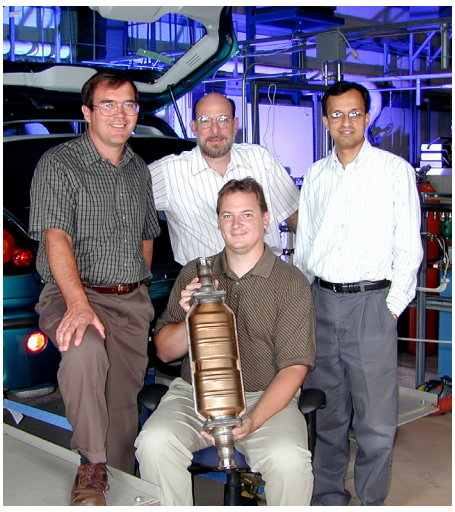
AWARDS

As individuals and as part of collaborative teams, our researchers have been widely recognized. For example, many of our staff have been recognized with awards from the American Chemical Society, American Vacuum Society and North American Catalysis Society, to name a few.

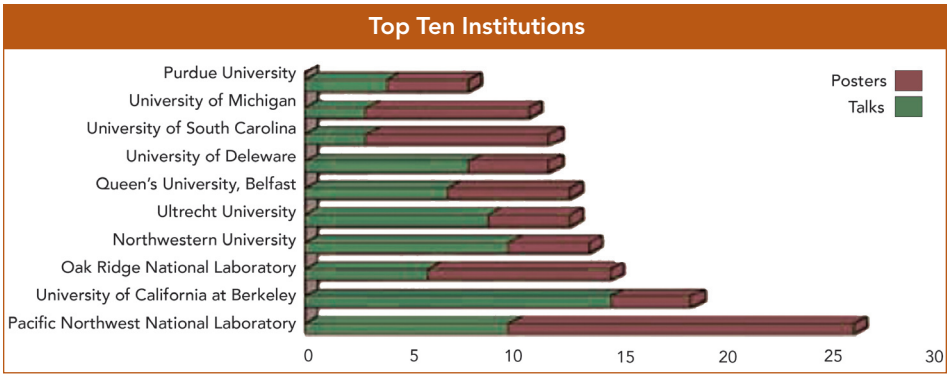
Our researchers have been on the winning teams for multiple R&D100 awards, recognizing outstanding innovation:

- Catalyst Materials for Plasma-Catalysis Engine Exhaust Treatment
- Compact Microchannel Fuel Vaporizer
- Self-Assembled Monolayers on Mesoporous Supports (SAMMS)
- Productions of Chemicals from Biologically Derived Succinic Acid
- Glycine-Nitrate Process for Producing Ultrafine Metal Oxide Powders.

Also, our transfer of science and technology to private industry has been recognized with Federal Laboratory Consortium Awards, including awards for many of the innovations that received R&D100 awards as well as Engine Exhaust Aftertreatment System Based on Non-Thermal Plasma-Assisted Catalysis and Catalyzed Electrochemical Oxidation. In addition, our team received the Presidential Green Chemistry Award for the Conversion of Paper Mill Sludges to Chemicals.



The developers of catalyst materials for plasma-catalysis engine exhaust treatment received a 2001 R&D100 award. The industry/national lab team included several PNNL staff.



In June 2007, staff from the Institute for Interfacial Catalysis delivered the most presentations at the 20th meeting of the North American Catalysis Society, held in Houston, Texas.

PUBLICATIONS

Through their extensive and highly regarded publications and presentations, our scientists and engineers continue to establish a reputation of excellence around the globe. Frequently featured, our articles have received most cited and most viewed awards from peer-reviewed publications. See http://iic.pnl.gov for a list of selected publications.

PATENTS

The Institute for Interfacial Catalysis, through PNNL, holds nearly 70 patents related to chemical transformations for biomass conversion, coal conversion, exhaust emissions, microchannel technologies, and alternative energy.

ABOUT PNNL

Pacific Northwest National Laboratory, a U.S. Department of Energy Office of Science laboratory, solves complex problems in energy, the environment, and national security by advancing the understanding of science. PNNL employs more than 4000 staff, has a business volume of $750 million, and has been managed by Ohio-based Battelle since the lab's inception in 1965.

For more information about the **Institute for Interfacial Catalysis**, contact:

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CATALYSIS

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