

A YEAR OF CHANGE, A FUTURE OF OPPORTUNITY

William R. Wiley

EMSL NEWS

Environmental Molecular Sciences Laboratory

EMSL Enhances User Proposal Process

Changes include focused science direction, peer-review process

During the past year, the Environmental Molecular Sciences Laboratory (EMSL) made several enhancements to its user policy and proposal processes using feedback and recommendations from its stakeholders—EMSL's Science Advisory Committee, composed of scientific experts from academia, industry, and the national laboratory system; the DOE Office of Biological and Environmental Research; and users. The new enhancements are helping EMSL continue to provide scientists nationally and internationally with a venue for performing world-class research.

Science Theme Call for Proposals

To focus its scientific direction, EMSL worked with its stakeholders to identify four major areas of research where tremendous growth is expected and where visiting researchers could make a scientific impact using our capabilities and expertise:

- atmospheric aerosol chemistry
- biological interactions and interfaces
- geochemistry/biogeochemistry and subsurface science
- science of interfacial phenomena.

A major call for proposals focusing on these science themes was implemented in April 2006 and was considered

a resounding success, with nearly 100 proposals received in response to the inaugural effort. Users can look for EMSL's next Science Theme call in February 2007.

More information on the EMSL science themes is located at <http://www.emsl.pnl.gov/using-emsl/call.shtml>.



Focusing EMSL's science direction and implementing peer review of all proposals during the past year are major steps that support EMSL as a venue where users conduct world-class science.

External Peer-Review Process

All proposals that EMSL receives are now distributed to members of an external peer-review panel—scientists from various institutions whose expertise match the proposals' research areas. The peer reviewers use certain criteria to evaluate each proposal:

- scientific merit and quality
- relevance to EMSL's mission
- potential for significant impact to EMSL's science themes
- appropriateness of requested resources
- potential to contribute significantly to highly cited publications.

Proposals that best meet these criteria are then selected for use of EMSL resources.

Other Calls for Proposals

In April 2007, EMSL will announce a capabilities-based call for proposals that will allow users to target instruments

FROM THE DIRECTOR:

Paving the Path to an Exciting Future of Opportunity



Allison Campbell
EMSL Director

EMSL has begun making several exciting enhancements that are paving the path towards our sustained future as a world-class scientific user facility.

First, we worked closely with our DOE client, Science Advisory Committee, and users to identify four science theme areas where growth is projected, and we targeted an annual call specifically to focus research on these science themes. Details of this

new call as well as other user policy changes are discussed in this newsletter and on our website at <http://www.emsl.pnl.gov>.

We added three new leaders who are recognized scientists and who will direct EMSL's continuous scientific growth and efforts for instrument refreshment and development:

- **Andy Felmy**, EMSL Chief Scientist. For the past 25 years, Andy has been a leader in the area of geochemical thermodynamics research.
- **Don Baer**, Lead Scientist for Interfacial Chemistry. Don has long been connected with EMSL and is internationally known for the application of surface analysis methods to examine corrosion processes and the reactive properties of oxide and mineral surfaces.
- **Steve Wiley**, Lead Scientist for Biology. Steve has served as Director of PNNL's Biomolecular Systems



Andy Felmy



Don Baer

Initiative, a multidisciplinary program to understand complex biological systems from a systems perspective.

We refreshed the membership and leadership of our Science Advisory Committee, the external body that provides EMSL with guidance on scientific direction. And our User Advisory Committee—which serves as the voice of our users—has become self electing. A new committee was formed in November, composed of 14 members elected by their peers from 31 excellent candidates from across the nation.

We held two very exciting and important workshops in an effort to identify future scientific challenges in our science theme areas and the instruments our users will need to address these challenges. A Radiological Nuclear Magnetic Resonance Workshop was held in May 2006, while a Recapitalization Workshop took place in August. Reports from both workshops will be rolled up into a refreshment plan that will drive significant future instrument development and procurement efforts at the facility.

We are growing rapidly as well. On January 10, we celebrated the first permanent expansion of EMSL—a nearly 4,000-square-foot raised floor that is part of our supercomputing operations center. We are well on our way to procuring our next-generation supercomputer that will support user research in the chemical, biological, and environmental systems sciences. Plans are underway to construct a new office pod that will house nearly 100 more staff and users. And we are making room for a new *operando* transmission electron microscope as well as enhanced capabilities in high-resolution characterization, proteomics, microbial dynamics and visualization, and optical probes.

I am indeed very excited about these changes and the future of this decade-old scientific user facility. I truly believe that these past and forward-looking enhancements will make EMSL *the* place where researchers worldwide will want to conduct science. — Allison



Steve Wiley

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A recapitalization workshop held at EMSL allowed more than 100 participants to brainstorm scientific and technical challenges related to future thematic research and identify instruments that will help address these challenges.

A Future of Opportunity: EMSL Begins Recapitalization Effort

The Environmental Molecular Sciences Laboratory (EMSL) has entered into its tenth year of operation, and the user facility is diligently working with its users to identify the important science challenges of the next 10 years and target major instruments and advancements that would support future research to address these challenges.

Late last summer, EMSL hosted 104 of its past and present users from 40 institutions at a recapitalization workshop that centered around four science themes identified by EMSL and its stakeholders as areas of great potential impact: atmospheric aerosol chemistry, biological interactions and interfaces, geochemistry/biogeochemistry and surface science, and science of interfacial phenomena. The participants—hailing from academia, industry, and the national laboratory system—worked together to identify the technical and scientific challenges they expect to face, including:

- Identifying the molecular-level mechanisms by which microbes sense changes in environmental conditions.
- Identifying the mechanisms of nucleation and growth of cloud droplets.
- Unraveling the genesis, properties, and effects of nanominerals and nanostructured materials in the environment.
- Understanding and controlling structure-function relationships of surfaces and interfaces, including those relevant to catalysis and energy production.

Once the participants identified these key challenges, they worked together in science theme-based breakout sessions to identify the instrumentation needed to address the challenges.

“This is a real opportunity for the entire field of environmental molecular science, a field we all support,” said Andy Felmy, EMSL Chief Scientist and co-organizer of the workshop.

In response to the collaborative workshop, EMSL has developed a recapitalization workshop report that is being rolled up with a previously developed Radiological Nuclear Magnetic Resonance Workshop report and compiled into an overall refreshment plan, with recommendations provided to EMSL’s funding agency, DOE’s Office of Biological and Environmental Research.

“We are grateful for the time and effort given by each participant during this workshop; they have done a great service to the entire scientific community,” said Felmy. “With their input, we now have identified critical new investments that will impact a wide range of national needs related to global climate change, subsurface remediation, and development of new energy technologies.”



» *User Proposals*, continued from page 1:

not fully subscribed during the Science Theme call. This new call will replace the nuclear magnetic resonance-specific call held in past years.

EMSL users are invited to continue to submit proposals for Computational Grand Challenges as well as open-call proposals.

Existing Proposal Timelines

Users with an approved open-call proposal in place before March 15, 2006, can continue that research only as late as March 15, 2007. Users with open-call proposals approved and in place on or after March 16, 2006, can continue to conduct their research one year from date of acceptance.

Rapid Access

EMSL now offers users rapid access in limited cases when a user needs fast turnaround of data—for example,

for a thesis or to further support research results that will be published. Requests for rapid access that are approved are valid for up to one month of EMSL use.

A Future of Opportunity

“Focusing our research in specific science theme areas and obtaining proposal reviews from external experts will result in a stronger, more robust research program for our users,” said EMSL Director Allison Campbell. “I believe this more scientifically focused proposal process, along with the concentrated efforts we are undertaking to refresh our instruments in line with our science themes, will make EMSL the choice of researchers for conducting world-class science.”

For more information on these enhancements, including timelines and extension periods for all proposals, see EMSL’s website at <http://www.emsl.pnl.gov> or <http://www.emsl.pnl.gov/using-emsl/impact.shtml>, or contact EMSL’s User Administration Manager, Nancy Foster-Mills, at emsl@pnl.gov or 509-376-1343.

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The William R. Wiley Environmental Molecular Sciences Laboratory (EMSL) is a Department of Energy national scientific user facility located at Pacific Northwest National Laboratory (PNNL) in Richland, Washington. The EMSL is operated by PNNL for the DOE Office of Biological and Environmental Research.

For additional details about the capabilities and research being performed at EMSL, please visit our web site at <http://www.emsl.pnl.gov> or call us at 509-376-1343.