William R. Wiley EMSL In Brief
Environmental Molecular Sciences Laboratory

Renowned Surface Chemist Visits EMSL's Interfacial and Nanoscale Science Facility

EMSL's Interfacial and Nanoscale Science Facility (INSF) is hosting and continuing collaborations with prestigious user J. Mike White, a Robert A.. Welch Chair of Chemistry at the University of Texas at Austin.

During White's visit this summer—his second in two years—his purpose is two-fold. First, the prominent surface chemist is analyzing data obtained during his earlier visit to EMSL, where he used the INSF's state-of-the-art equipment and laboratories to study the fundamentals of photocatalytic reactions of single-crystal thin films coated with titanium dioxide to achieve self-cleaning glass—that is, glass surfaces that won't fog or bead up when water condenses on them. During the past year, White and his collaborators published three papers describing the research in the *Journal of the American Chemical Society* and *Journal of Physical Chemistry*, with a fourth currently in press. Two to three additional papers are now in progress.

As part of a collaborative project among various national laboratories and universities, White and post-doctoral fellow Oleksander Bondarchuk are also using EMSL's cutting-edge capabilities—in particular, scanning tunneling microscopy—to investigate potential heterogeneous catalysis applications of mixed oxides by depositing tungsten trioxide on the titanium dioxide single crystals. Such applications include achieving hydrogen gas that results from water splitting on the titanium dioxide.

In the future, White—who counts EMSL Director J.W. Rogers, Jr. and fellow collaborator and Pacific Northwest National Laboratory researcher Mike Henderson among his former PhD students—hopes to again use EMSL capabilities.

"I've been interested in oxide surface chemistry for a long time," says White. "From my point of view, there are two places in the world where there is a critical mass of expertise in that arena: one is the Fritz-Haber Institute in Berlin, and the other is EMSL."

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