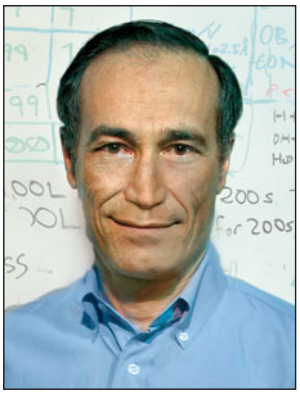


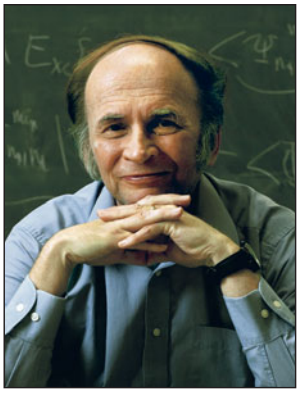
Miquel B. Salmeron named 2012 MRS Medalist for surface science studies

The Materials Research Society has named Miquel B. Salmeron of the University of California–Berkeley and Lawrence Berkeley National Laboratory as MRS Medalist. He was cited for his "contribution to the molecular level understanding of material surfaces under ambient conditions of gas pressure and temperature made possible by the development and application of Ambient Pressure Photo-Electron Spectroscopy (APPES), which revealed the chemical structure of liquids, catalysts surfaces and nanoparticles during environmental reaction conditions." Salmeron will be recognized during the awards ceremony at the 2012 MRS Fall Meeting in Boston.

Traditionally, research on surfaces has been largely based on the use of electrons, atoms, and ions that require research to be carried out under high vacuum conditions. Salmeron developed, in the 1990s, ambient pressure photo electron spectroscopy (APPES), which advances the understanding of surface science in realistic gas environments.

With the development of APPES, researchers can use the surface and chemical sensitivity of electron spectroscopies to obtain information at high pressures based on core-level excitations, often providing critical information that cannot be obtained from other high-pressure techniques. Since the introduction of this instrument in 2002, Salmeron and his group have resolved some key surface science questions such as the structure of ice during premelting, the segregation of anions to the surface of saline solutions, wetting of water on oxide surfaces, oxidation of noble metals, and surface reconstruction of catalytically active surfaces at high pressures. The APPES technique has been particularly valuable in industrial research for probing the chemical nature of surfaces in real-world environments. Today, the APPES technique has been commercialized by two companies and has been adopted by more than 10 synchrotron facilities around the world.

Salmeron received his BA degree from the University of Barcelona (1967) and his PhD degree from the Universidad Autonoma of Madrid, Spain (1975), both in physics. In 1984, he moved to the Lawrence Berkeley National Laboratory as a Divisional Fellow, becoming a senior scientist in 1990 and where he served as director of the Materials Science Division through August of this year. He joined the faculty at UC–Berkeley as an adjunct professor in 2006. He has 390 publications and four US patents. His honors include Fellow of the American Physical Society (1996) and of the American Vacuum Society (2003); the Klaus Halbach Award for the development of innovative instrumentation (2004); the Medard Welch Award of the American Vacuum Society and the Langmuir Lectureship Award of the American Chemical Society, both in 2008; and the Outstanding Lecturer Award, Pacific Northwest National Laboratory (2010).



John P. Perdew receives 2012 Materials Theory Award for density functional theory

The Materials Research Society has named John P. Perdew of Tulane University in New Orleans, La., as the recipient of the 2012 Materials Theory Award for his "pioneering contributions to the fundamental development and nonempirical approximations in density functional theory." Perdew will be recognized during the awards ceremony at the 2012 MRS Fall Meeting in Boston.

The Materials Theory Award, endowed by Toh-Ming Lu and Gwo-Ching Wang, "recognizes exceptional advances made by materials theory to the fundamental understanding of the structure and behavior of materials."

In 1998, Walter Kohn was awarded the Nobel Prize in Chemistry for his 1964–1965 development of the density functional theory (DFT), recognizing a decisive milestone in the understanding of the behaviors of complex multi-electron and many-atomic systems. From there, Perdew and his colleagues helped build up the framework from first principles to resolve remaining challenges in materials science. For example, with David Langreth in

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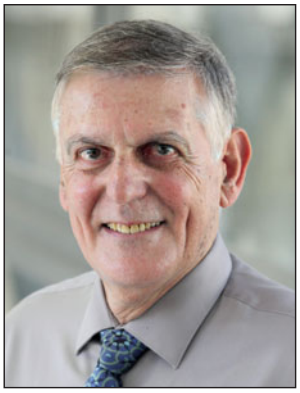
the 1970s, Perdew derived the adiabatic connection formula, which expresses the exchange-correlation energy in terms of the exchange-correlation hole around an electron. Combining the adiabatic formula with the fluctuation-dissipation theorem, they also proposed the random phase approximation in a density functional context 30 years before its current popularity. With Mel Levy in the 1980s, he derived many analytic properties of the exact density functional, including scaling equalities and inequalities as well as the derivative discontinuity at integer electron number and its contribution to the fundamental bandgap. With Kieron Burke and Matthias Ernzerhof in the 1990s, Perdew developed a standard generalized gradient approximation in an article now cited more than 23,000 times. With the numerous approximations Perdew has introduced into the literature, thousands of researchers have been able to perform ever more accurate first-principles DFT calculations and simulations for many properties of many materials and molecules.

Perdew received his PhD degree from Cornell University (1971). He has over 260 publications. His honors include election to the International Academy of Molecular Sciences (2003) and the National Academy of Sciences (2011).



Dan Shechtman to give plenary address on quasicrystals at 2012 MRS Fall Meeting

Nobel laureate Dan Shechtman of the Technion in Haifa, Israel, and Iowa State University, will give the plenary talk on "Quasicrystals: Discovery, structure, property and uses," at the 2012 Materials Research Society Fall Meeting in Boston. His talk will outline the discovery of quasicrystals and discuss their structure as well as some of their properties and uses. The presentation will be given on Monday, Nov. 26 at 6:30 p.m. in the Grand Ballroom of the Sheraton Boston Hotel & Towers.

Shechtman made the discovery in 1982, followed by the unpopular announcement in 1984, of the first quasiperiodic crystal that revolutionized the understanding of the atomic order of solids. "QCs are ordered materials, but their atomic order is quasiperiodic rather than periodic, enabling formation of crystal symmetries, such as icosahedral symmetry, which cannot exist in periodic materials," Shechtman said. While Shechtman faced nearly a decade of harsh resistance from the crystallography community, research persisted, producing the publication of a large volume of experimental and theoretical studies. In 2011, Shechtman received the Nobel prize in Chemisry for his work on quasicrystals.

After receiving his doctorate degree from the Technion, Shechtman was an NRC fellow at the Aerospace Research Laboratories of Wright Patterson Air Force Base, Ohio. In 1975, he joined the Department of Materials Engineering at the Technion where he is currently a distinguished professor, and in 2004, Iowa State University and Ames Laboratory. He is a member of several academies, including the National Academy of Engineering, and he is an honorary member of professional societies around the globe. He has been awarded many prizes, including the Wolf Prize in Physics, the Gregori Aminoff Prize of the Royal Swedish Academy of Sciences, and the 2011 Nobel Prize in Chemistry. □

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