

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 lit-

erature, 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

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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 quasicrystal 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 Chemistry 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. □

TUTORIALS | Sunday, November 25 Hynes Convention Center

TUTORIAL P
Organic Semiconductor Crystals 101
9:00 am – 4:15 pm Room 207

TUTORIAL W/WW
Graphene
9:00 am – 5:00 pm Room 210

TUTORIAL AA 1
Describing and Visualizing Crystal Structures
8:30 am–12:00 pm Room 200

TUTORIAL AA 2
Piezoresponse Microscopy and Spectroscopy—
Fundamentals and Insights into the Properties and
Performance of Oxide Nanoelectronic Materials
1:30 pm – 5:00 pm Room 200

TUTORIAL II
Structure, Characterization, and Modeling of
Domain Interfaces and Grain Boundaries in
Materials
1:30 pm – 5:00 pm Room 202

TUTORIAL LL
Analysis of Radioactive Nuclear Materials
9:00 am – 12:00 pm Room 203

TUTORIAL OO
Reactive Materials—Fundamentals, Synthesis
Techniques, and Applications
1:30 pm – 5:00 pm Room 206

TUTORIAL VV
Neutron and X-rays—Sources, Instrumentation,
and Scattering
1:30 pm – 5:00 pm Room 208

TUTORIAL AAA
Developing Successful Business Plans for
Science and Technology Ventures
1:30 pm – 5:00 pm Room 204

Visit www.mrs.org/f12-tutorials for details.

