

# ENI AWARD 2015 Renewable Energy Prize

Mercouri Kanatzidis

Winner

## *Energy from Waste Heat Using Nanostructured Thermoelectrics*

### Research Description

Kanatzidis' research has generated seminal work in synthetic metal chalcogenide chemistry and the development of new functional chalcogenide materials. He is interested in those chemical processes that are likely to lead to new solid materials and particularly those with high intellectual and technological impact. He has been active in the field of energy conversion materials and catalysis. He has been researching new thermoelectric materials which convert heat to electrical power for over twenty years. His landmark achievement is the discovery of nanostructured thermoelectrics that broke 40 decade old efficiency records. Thermoelectrics are semiconductors that convert waste heat into electricity. By harvesting waste heat thermoelectric materials can save energy in many thermal processes including automobiles helping to reduce CO<sub>2</sub> emissions. He has contributed to deeper fundamental understanding of the thermoelectric process and opened paths to further breakthroughs. He also studies chalcogels, complex intermetallic phases and superconductors. He has interests in the synthetic design and prediction of new phases especially those that can cause disruptive changes in scientific thinking and in technology. The bulk of his work is described in the more than 850 research publications and over 20 patents.