

CENTER FOR RESOURCE RECOVERY AND RECYCLING

Graduate Seminar Lecture Series

Sustainable Development for the 21st Century: The Role of Materials Science and Engineering



Diran Apelian
WPI

Diran Apelian is Howmet Professor of Engineering and Director of the Metal Processing Institute at Worcester Polytechnic Institute. He received his BS in metallurgical engineering from Drexel University in 1968 and his doctorate in materials science and engineering from MIT in 1972. He worked at Bethlehem Steel's Homer Research Laboratories before joining Drexel's faculty in 1976. At Drexel he held various positions, including professor, head of the Department of Materials Engineering, associate dean of the College of Engineering, and vice provost of the University. He joined WPI in July 1990 as the Institute's provost. In 1996 he returned to the faculty and leads the activities of the Metal Processing Institute.

He is credited with pioneering work in various areas of metals processing—molten metal processing, aluminum alloy development, plasma deposition, spray casting/forming, and semi-solid processing of metals. During the last decade, he has worked on sustainable development issues, particularly, resource recovery and recycling. Apelian is the recipient of many distinguished honors and awards, national and international; he has over 500 publications to his credit; and he serves on several technical, corporate, and editorial boards. During 2008/2009, he served as president of TMS. Apelian is a Fellow of TMS, ASM, and APMI; he is a member of the National Academy of Engineering and the Armenian Academy of Sciences.

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By 2050 the world population will reach over 9 billion and “flattening of the world” will be an understatement. We anticipate burgeoning needs with respect to energy resources, transportation, housing, food distribution/packaging for the masses, recycling, and health care/health care delivery, not to mention climate change and environmental issues. The issues we face today will be insignificant to what we may expect if we (global society) do not act. World population is increasing at an average rate of 1.4% and, in contrast, world energy consumption is increasing at an average rate of 1.7%. Such an imbalance is not sustainable and requires action. From a societal perspective, engineers have played a major role to enhance the quality of life in our world. Sustainable development in the 21st Century is perhaps the most critical challenge we face. Materials Science and Engineering opportunities for sustainable development in this century will be presented and discussed.