Materials Engineering for Sustainable Energy and Environment

The Forum aimes at highlighting innovative materials science approaches in the fields of sustainable global engineering of energy and water challenges. A rather broad key note type introduction will be followed by short and specific contributions of panelists and finally by discussions among panelists and between audience and panelists.

CO_2 Engineering

Underground storage of CO_2 risks to shift a problem instead of solving it. We discuss materials challenges of CO_2 sequestration, CO_2 up-grading, solid state storage, photochemical conversion into fuels as well as production of goods (e.g. cement) with reduced CO_2 emission.

Thermal Energy Engineering

The largest part of energy we consume is in the form of thermal energy, produced from fossil fuels. We will look into alternatives:

a) Concentrated solar heat (>600 °C) production and its use for CO_2 emission reduction: steel and cement fabrication, firing of brick & ceramics.

b) Energy efficient buildings, heat recovery, waste heat up-grading by thermoelectrics, materials for heat conduction, storage, insulation.

Electronic Device Energy Engineering

Low power electronic components as well as smart energy harvesting for cableless devices are challenges not only of ICT. We will focus on super-low power devices, atomic switch and other low energy memory devices, on
energy harvesting (piezoelectric, microvwave, shape-memory-alloys, thermoelectrics, photovaltaics, wireless sensing, and cableless transmission.

Water-Materials Engineering

Already before we will have solved the global energy problem humanity will be concerned with global water issues. Our topics are materials challenges in the fields of desalination, cavitation in hydropower turbines, corrosion, upgrading water quality by take off residual radioactive or hormon-active impurities by functionalized nanopowders.

Format
12:15 Key note lecture
13:45 Panel: 4-6 short lectures (10') by Panelists, discussion
14:00 Open discussion, Audience with Panelists
14:30 Round up, End

Forum organizers

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