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**Keynote Lecture**

**Materials Science and Engineering in Europe:  
Strong Challenges, Great Difficulties, Nice Opportunities**

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**Abstract**

In the frame of a mission mandated by the European Science Foundation, a prospective on future materials is actually under elaboration. This prospective complements the recently published EC report on “Materials for Key Enabling Technologies”. It is based on representative case studies in the field of metals, ceramics, functional materials and biomaterials. In an orthogonal approach, it presents the expected impact of these case studies on the Grand Challenges Energy, Mobility & Transport, Environment & Climate, Information & Communication, and Health. This prospective will be presented and recommendations will be provided for an efficient use of nanotechnology, analytical tools, combinatorial materials science, modeling, synthesis and processing, surface science, multifunctionality, recycling, interdisciplinarity and education.

In another though complementary perspective, the “European paradox”; i.e. the reduced capacity of European countries to transform the scientific results to market products will be highlighted. It will be shown that here is actually a “The Valley of Death” between them, which is mandatory to bridge if we want Europe to remain a key player in the global competition. Materials science and engineering is a central component in enabling innovation and for this reason its contribution to bridging knowledge to market through technological research, product development and competitive manufacturing is essential.