

Preface

Engineering ceramics are a class of materials, which steadily occupy a larger proportion of industrial applications. The reason for this positive development is that engineering ceramics have found applications, which are not only mechanical. Newly developed engineering ceramic materials are moving from pure engineering applications requiring “only” the mechanical performance of the material to more sophisticated applications where the mechanical performance is combined with some other functionality.

The advanced research workshop *Engineering Ceramics'11* held in the Smolenice castle, Slovakia from 8 to 12 May 2011 with the subtitle: *From materials to components* is a logical successor to the previous one, *Engineering Ceramics'07*, with the subtitle: *From engineering to functionality* and fully confirms this development. The workshop showed new trends in ceramics research as well as in their application in industry. The orientation of research to nano-ceramics, ultrahigh temperature materials and multifunctional materials was supported not only by lectures from academia, but also by lectures from industry and showed that multifunctional ceramic materials have the potential to be applied in industry, mainly in the automotive and engineering sectors. Applications as extremely low friction ceramics for high pressure pumps for engines and wind turbine ball bearings, ceramic substrates for high power devices, ceramic implants, etc. are examples of ceramic devices which make new technologies possible.

The achievements of the science of ceramics are remarkable and, as described above, they are targeted towards new

technologies which affect everyday life in a positive sense. In contrast, the disaster in the Fukushima nuclear power plant has had the opposite effect. Also our workshop on Engineering Ceramics was touched by this event. Many of our friends in Japan suffered as a result of this disaster and some of them were not able to participate for this reason.

All of us have followed the catastrophic news from Japan. All the time we were thinking of our colleagues with great sympathy. We would like to express our condolence towards all victims in beautiful Japan.

The award of the Aurel Stodola plaque for the achievements in the technical sciences to Prof. Dr. Kiyoshi Hirao by the Presidium of the Slovak Academy of Sciences is more than symbolic in this situation. Professor Hirao deserved this prize not only as an excellent scientist but also as a long term collaborator with scientists from Slovakia.

The program of the meeting was to a large extent inspired by the ideas of Frederick Lange, who participated in Engineering Ceramics workshops in Smolenice castle in the past. Many lectures touched on topics and ideas, which were matters of interest to Fred in recent years before he passed away. Unfortunately, the brilliant ideas of Fred will be deeply missed by the community of his collaborators all over the world. That is the reason why the organizers decided to dedicate the Engineering Ceramics'11 workshop to his memory.

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