

Humboldt Kolleg

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Global Challenges of the 21st Century

- 1) Technological development and human health/ quality of life*
- 2) Climate change and environmental sustainability*
- 3) Democracy and cohesion in Europe*

Crystals: Key Elements in Modern (Green) Technologies

Crystals have represented a key element in the development of modern technologies. Without the growth of the perfect semiconductor single-crystal (like Si or Ge), the invention of the transistors will have never happened. One finds electronic circuits based on silicon in every computer or mobile phone. The modern information society will not have been achieved without electronic and optical devices based on compound semiconductors. One of the most impressive examples is the invention of the liquid-phase epitaxy, which made it possible to achieve the light-emitting diode (LED) and the laser diode (LD), with its huge effect on energy saving. Throughout history, the emergence of new optical and electronic devices has always been linked to an invention in crystal growth technologies.

Daniel Vizman is Professor of Physics at the West University of Timisoara, Romania and the Dean of the Physics Faculty. Prof. Vizman received his PhD in Physics from the West University of Timisoara in 1998. He spent one year (1999) as a Humboldt fellow and two years as a Visiting Research Scientist at the Fraunhofer Institute IISB, Erlangen, Germany. His main research interest is in the crystallization processes both at a laboratory and at an industrial scale. He was the leader of the development team of a commercial software for modelling of crystal growth processes at Fraunhofer Institute IISB. He was awarded the Romanian Academy Award in 2014 for his contribution to the field of modelling of the crystal growth processes. Between 2012 and 2018 he was the Secretary of the European Network of Crystal Growth.