
J o i n t S E M I N A R
on
Semiconductor Physics and Nanotechnology & ESI - Seminar

Mo, 13.03.2023, 11:15 Uhr,

**Seminar in
person in the Physics lecture hall or via Zoom**

“Potential and marketed applications of quasicrystalline alloys”

em. Prof. Jean-Marie Dubois

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The discovery of quasicrystals by Shechtman et al. in 1982-84 has revolutionised our understanding of crystals and order in solids. Shechtman was awarded a Nobel Prize in Chemistry in 2011 to recognize the importance of this breakthrough. Soon after the initial publication [1], a patent was filed by the author to secure the potential application of these new materials to the fabrication of low-stick surfaces adapted to the industrial production of cooking utensils [2]. Quite a few more patents followed, covering several areas of technological relevance such as low friction, thermal insulation, solar light absorption, etc.

The first application failed, although it reached market. Few others never developed to this stage, but also a (very) small number can now be considered as commercially successful. This is especially the case of polymers reinforced with a quasicrystal powder that are especially adapted to additive manufacturing or 3D printing [3]. Also very advanced is the use of a blend of quasicrystalline and complex intermetallics powders to mark and authenticate an object in a way that cannot be counterfeit [4]. The talk will review the state of the art and address few technological breakthroughs that are based on quasicrystalline alloys in the areas of solid-solid and solid-liquid adhesion. Unfortunately, time will be too short to address other issues such as catalysis or guide waves.

[1] D. Shechtman et al., Phys. Rev. Lett. 53-20 (1984) 1951-54.

[2] J.M. Dubois and P. Weinland, French Patent n°2635117, dated 04 Aug. 1988.

[3] S. Kenzari et al., Sci. Technol. Adv. Mater. 15 (2014) 024802 (9pp).

[4] S. Kenzari and V. Fournée, European Patent EP 3 652 526 B1, dated 11 July 2018.

Zoom – Link:

<https://zoom.us/j/96375934537?pwd=RTIKTWwhSdzRHU211YTY1bGFxTUtpZz09>

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