"Hydrogen effects on the deformation and fracture of alloys"

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The increasing demand of lightweight structures requires high-strength materials. However, with increasing strength many materials show an increasing susceptibility to hydrogen embrittlement. Hence, it is of vital interest to understand the reasons of hydrogen embrittlement (HE) and produce more resistant alloys. In this talk, I will explain first the nature of interactions between crystal defects (e.g. grain boundaries) with hydrogen atoms. In the second part, the conventional and modern techniques for quantifying the impact of hydrogen on material properties will be explained. And finally some methods for decreasing the susceptibility of alloys to HE like alloy design or grain boundaries engineering will be discussed.