

# The cosmic journey of iridium

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Iridium is an extraordinary material with very special qualities. Therefore this noble metal is the material of choice for many technical applications on Earth. Within this conference contribution the life cycle of iridium is presented. All iridium atoms in the universe are initially born via the r-process in extreme cosmic events; thereby the majority of iridium is produced in the collision of two neutron stars [1]. On Earth iridium is quite rare, only about 0.4 ppm of Earths crust is made from this material. However, geologically there is a remarkable iridium anomaly found in the Cretaceous-Tertiary boundary layer, where the amount of iridium increases by a few orders of magnitude. The common hypothesis to explain this strange anomaly is the impact of a heavy meteoroid in the Gulf of Mexico about 65 million years ago [2]. This catastrophic event distributes the higher iridium content of the impactor all over Earths surface and probably caused the extinction of the dinosaur. Today about ten tons of iridium per year are used for technical applications worldwide. Here especially the space applications of iridium are of interest. At Aschaffenburg University iridium coatings are developed as reflection layers for space based X-ray telescopes [3]. Via such iridium coated mirrors the X-ray pattern of the merger of two neutron stars could be observed, where fresh iridium atoms are born. Iridium has been also used as cover material for the thermonuclear batteries of the Voyager space probes - which are just leaving our solar system [4]. So the cosmic journey of iridium is really a fascinating round trip from stars to Earth and into space again.

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[4] W. R. Kanne, *Welding Journal* **62**, 17 (1983).