

News Release

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## **Scientists developing new cost-effective materials for magnetic storage devices**

An international team of European and Japanese scientists led by the University of York has launched a €4.6m collaborative project funded by the European Commission (EC) and the Japanese Science and Technology Agency (JST) to develop new materials to replace the scarce metal Iridium commonly used in magnetic storage devices.

All spin electronic devices use an Iridium alloy, including hard disk drives and next-generation magnetic memories. Due to the scarcity of the metal and the increasing take up of these new technologies, the price of Iridium has begun to soar.

Under the EU-backed project, the research team, which includes Bielefeld and Konstanz Universities, Germany, Budapest University of Technology and Economics, Hungary and UK-based Mackintosh Consultants, as well as the University of York's Departments of Electronics and Physics, intends to develop Heusler alloy films to provide a cost-effective alternative to Iridium.

The European scientists will be working closely with a Japanese research team led by Professor Koki Takanashi from Tohoku University. The initiative is expected to lead to more European-Japanese co-operation in this important area of materials research in the future.

Project Scientific Co-ordinator Dr Atsufumi Hirohata, from the University of York's Department of Electronics, said: "It is widely recognised that spin electronic technologies will displace volatile semiconductor memory technology within the next decade. Therefore the lack of availability of one crucial element from within the periodic table is a critical issue to be solved urgently.

“The price of Iridium has risen by a factor of 4 in the last five years and by more than a factor of 10 in the last decade. It is expected to soar perhaps by a factor of 100 due to its wider application.”

Using their collective expertise and techniques such as high-resolution (scanning) transmission electron microscopy and highly sensitive electrical and magnetic measurement facilities available within the consortium, the international team intends to develop a viable replacement for Iridium over the course of the four-year-project.

Professor Takanashi said: “My colleagues at the High Energy Accelerator Research Organization in Tsukuba and my staff here at Tohoku University are excited to be working with such prestigious universities in Europe on this challenging but vital research. Iridium is such a rare metal - twice as rare as gold in the earth’s crust - that relying on it for such a key future technology represents a very high risk strategy. Our research programme will impact this key material directly by providing an improved understanding of a wide ranging class of ternary alloys, and we will seek to find new materials and new compositions of Heusler Alloys to replace the need for Iridium in spin electronic devices.”

The Heusler Alloy Replacement for Iridium (“HARFIR”) project has received €1.8m in EU funding, with matching funding from the JST, under the Strategic International Collaborative Research Programme entitled Development of New Materials for the Substitution of Critical Metals launched by the EC and the JST.

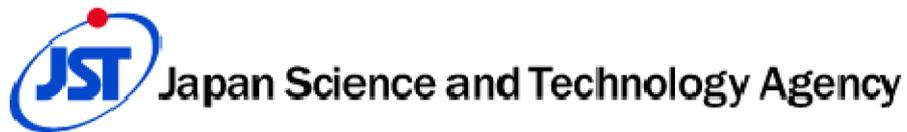
Under the programme, EU consortia are twinned with a Japanese research team and the project includes integrated and coordinated research activities including intensive exchange and training of researchers.

**ENDS**

## Notes to editors:

- For more information on the Heusler Alloy Replacement for Iridium (HARFIR) project visit <http://www.HARFIR.eu>
- For more information on the Strategic International Collaborative Research Programme, “Development of New Materials for the Substitution of Critical Metals” see [http://ec.europa.eu/research/industrial\\_technologies/pdf/eu-japan-2013\\_en.pdf](http://ec.europa.eu/research/industrial_technologies/pdf/eu-japan-2013_en.pdf)
- More information on the University of York’s Department of Electronics at [www.york.ac.uk/electronics](http://www.york.ac.uk/electronics)
- More information on the University of York’s Department of Physics at [www.york.ac.uk/physics](http://www.york.ac.uk/physics)

## Images to be attached to the News Release



High quality EU flag and FP7 logos can be found at:  
[http://ec.europa.eu/research/fp7/index\\_en.cfm?pg=logos](http://ec.europa.eu/research/fp7/index_en.cfm?pg=logos)