

JSPS Open Partnership Joint Project (2015 to 2017)

Improvements of room-temperature-magnetoresistance materials by means of spin-orbit interaction

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Prof Yamaura and Prof Boothroyd began collaborating in 2013. They share a common interest in novel oxides containing heavy transition metal ions, especially osmates. Prof Yamaura's group has a particular expertise in high pressure synthesis, and Prof Boothroyd's group performs a range of different physical measurements, especially neutron and x-ray scattering. In 2013, Prof Boothroyd visited NIMS for 1 week at the invitation of Prof Yamaura, and this led to a series of joint projects in which osmates newly synthesised in Prof Yamaura's group were studied in Oxford to measure and understand their unusual magnetic and electrical properties. In 2014, Prof Yamaura visited Oxford to speak at an international workshop "Mott Physics beyond the Heisenberg Model", organised by Prof Boothroyd.

The JSPS joint project built on the initial collaborative work by enabling four young scientists from Prof Yamaura's group (Dr Tsujimoto, Dr Belik, Ms Yu and Mr Zhang) to visit Oxford and spend a period of time (1-2 weeks each) in Prof Boothroyd's group in the Department of Physics. Funding on the UK side was available from a research grant awarded by the Engineering and Physical Sciences Research Council. As well as taking part in scientific discussions and seminars, the visitors had a tour of the ISIS neutron and muon facility, which is a world-class condensed matter research facility on the Harwell-Oxford Campus. Also during the visits, future collaborations were planned and a joint beam time proposal was written which led to a collaborative experiment at the ISIS Facility during 2017.

Since the scheme ended, Prof Boothroyd attended the International Conference on Advanced Materials, held in Kyoto in September 2017, at the invitation of Prof Yamaura. Further scientific discussions took place during the conference, and the collaboration continues. Prof Boothroyd is keen to apply to the JSPS at some time in the near future to spend a month in Japan.



Dr Prabhakaran, Mr Marein Rahn, Dr Tsujimoto, Ms Su Yu, Prof Andrew Boothroyd outside the Clarendon Laboratory, during the visit of Dr Tsujimoto and Ms Su Yu to Oxford in 2016.