

Research Visit to the Shimakawa Group, Kyoto University

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Thanks to the collaboration between Professor J. Paul Attfield (the University of Edinburgh) and Professor Yuichi Shimakawa (Kyoto University), I had this opportunity to visit Professor Shimakawa's research group and to carry out a one month short term research project under his supervision. This visit has provided me not only valuable scientific data that are essential to my research and insights to new knowledge and practical skills, but also the chance to explore Japan, a country that is highly praised for its exceptional cuisine and the richness in traditional culture, which I have long been fascinated.



My research focuses on investigating the charge, spin and orbital ordering phenomena in novel solid state materials, particularly in the iron oxide systems. During my visit, I have carried out Mossbauer spectroscopic studies on one of my recently reported materials – CaFe_3O_5 , an oxide that undergo long range electronic phase separation upon cooling below room temperature, accompanied by spin, charge and orbital ordering. The charge ordering of $\text{Fe}^{2+/3+}$ also leads to the formation of trimerons, similar to what was reported in magnetite. The Mossbauer data provided further understanding in the local environments of the two independent iron sites in each of the two low temperature phases in CaFe_3O_5 .

I acknowledge financial supports from ICR Young Researcher Short-Term Exchange Program, Japan Society for Promotion of Science (JSPS), Engineering and Physical Sciences Research Council (EPSRC). I would like to once again thank Professor Yuichi Shimakawa and Doctor Takashi Saito for their support and guidance, and the assistance provided by all the Shimakawa group members.

