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[Top](#)[Home](#)[News](#)[Groups](#)[Events](#)[Login](#)[Member  
Registration](#)[Features & QuickGuide  
\(English\)](#)[Features & QuickGuide  
\(Japanese\)](#)[My research life](#)[Member's Voice](#)[Seeking early-career  
researchers](#)[About us \(English\)](#)[About us \(Japanese\)](#)

## Member's Voice

[TOP](#) > [Member's Voice](#)

The effects of last year's Covid-19 outbreak have disrupted exchange between people and travel among communities, causing various feelings of being isolated and cooped up for nearly a year now. Still, it is our hope that this finds all of you doing well.

Amidst this situation, JSPS-Net is exploring various ways to increase mutual exchange among you, the members. As our first step, we have created a new corner on the JSPS-Net website, called "Member's Voice." We will build it along with receiving articles from you.

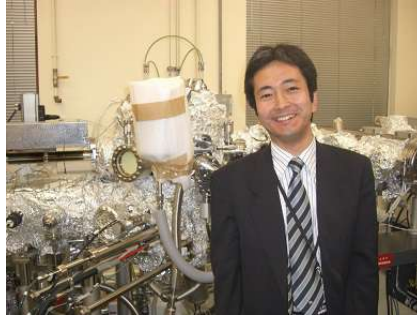
### Main topics on this corner

- Your relationship with Japan; Thoughts or reminiscences on living as a researchers in Japan
- Your current research activities
- Messages for other members

If you are interested in this corner, please contact to [jsps-net@jsps.go.jp](mailto:jsps-net@jsps.go.jp)

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# Member's Voice



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My research group at the Department of Electronic Engineering in the University of York has been actively focusing on spintronic devices and magnetic materials. I started my research career with magnetic domain imaging with scanning probe microscopy and spin-polarised electron transport in a ferromagnet/semiconductor junction as my BSc/MSc and PhD projects. My experience as a post-doctoral researcher in the University of Cambridge, Massachusetts Institute of Technology, Tohoku University and Riken gave me additional skills on nanometric devices and junctions as well as Heusler alloys.

Based on these track records, we have been working on three key subjects; the demonstration of new spintronic device concepts, the investigation of new magnetic materials and the development of new imaging and spectroscopic techniques. For the new spintronic device concepts, we have been collaborating with theory groups in Japan, UK and China to utilise

geometrical, mechanical, thermal and optical effects, which have not been studied intensively to date. These concepts can offer fundamental building blocks for energy efficient computation. For the new magnetic materials, we have been growing and evaluating ternary and quaternary Heusler alloys to demonstrate half-metallic ferromagnetism and antiferromagnetism in an ultrathin film form at room temperature. These films can be used to improve the performance of the conventional spintronic devices, such as a magnetic tunnel junction for a read head in data storage with higher areal density, a cell in magnetic memory for lower power consumption and a sensor for better sensitivity. The new imaging techniques have been developed mainly in collaboration with our industrial partners, resulting in non-destructive imaging on buried interfaces and a bandgap measurement on a half-metallic material.

We have many strong collaborations with many world-leading groups, leading to ~10 refereed articles in scientific journals and ~10 invited presentations at major international conferences annually. We have also published 7 book chapters (including 3 books edited) and 36 patents (including 8 pending). We are keen to welcome new members and visitors.

Close