## Thermoelectric Generation Driven by Magnetism: A Perspective in Combined X-ray and Neutron Vision

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Thermoelectric generation is one of the promising technologies for green energy harvesting since it enables direct conversion from thermal energy to electrical power. A magnetic or *spintronic* analogue to thermoelectric generation, the 'Spin Seebeck Effect' (SSE), has attracted recent science interest due to the possibility for new technology innovations in the renewable energies sector. Visualising how the local magnetic textures influence the electrical current generation is of crucial importance to the development of devices based on SSE. Recent Polarised X-ray Resonant nanoDiffraction Imaging of the magnetic domains, in prototype Spin Seebeck device structures, taken at nanoMAX of MAX-IV and ID01 of ESRF will be presented. In addition, complementary Polarised Neutron Scattering results, that uniquely bring to light the magnetic mechanisms driving the SSE electric current generation, will also be presented. This talk will provide an exciting perspective for future visions, in exploiting the synergy between X-rays and Neutrons, that will become possible in Lund with MAX-IV and ESS.