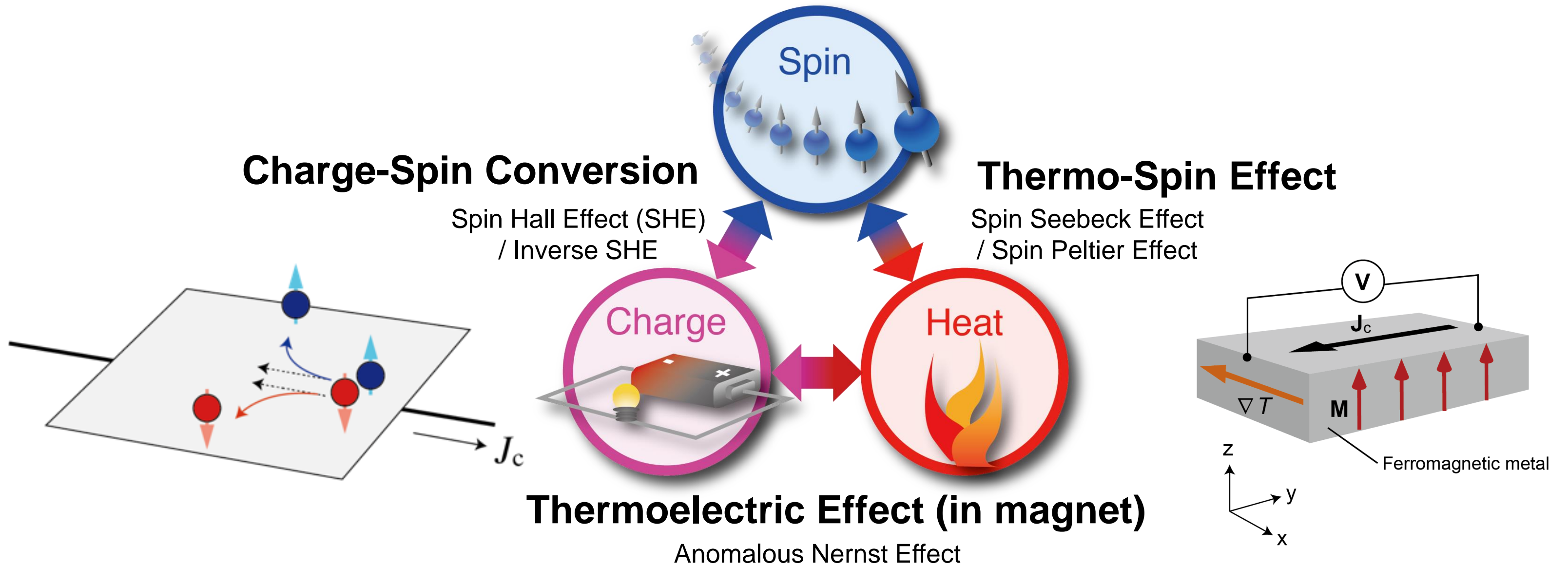


# 磁性材料学研究部門 / Magnetic Materials (関研究室 / Prof. T. Seki)

## Interplay between Charge, Spin and Heat

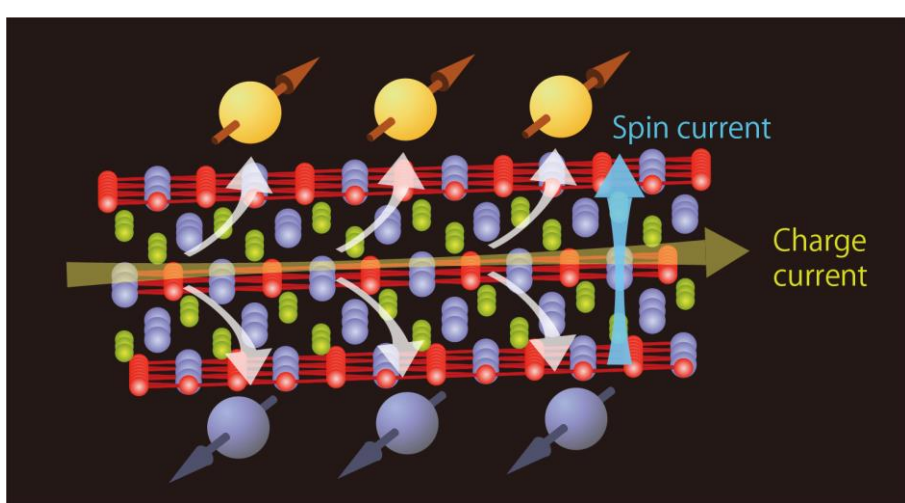


## Materials development for high-efficiency conversion

### New spin-Hall material

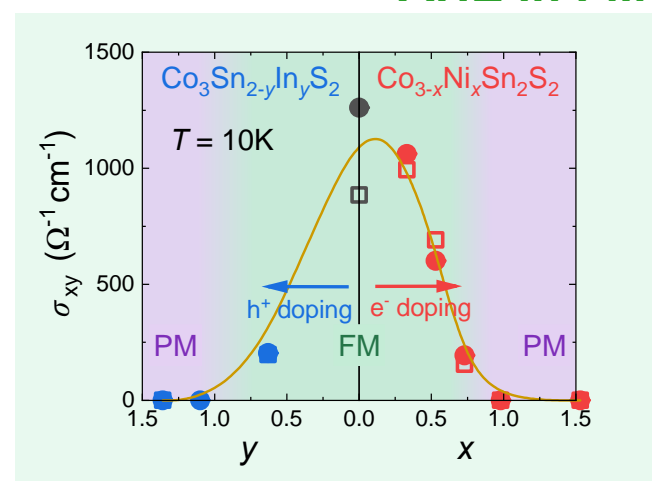
#### Co<sub>3</sub>Sn<sub>2</sub>S<sub>2</sub> (CSS)

- ✓ Shandite structure
- ✓ Alternate Co<sub>3</sub>Sn and SnS<sub>2</sub> planes
- ✓ Half metallic ferromagnet
- ✓ T<sub>C</sub> ~ 177K; 0.29 μ<sub>B</sub>/Co atom
- ✓ Magnetic easy axis along c

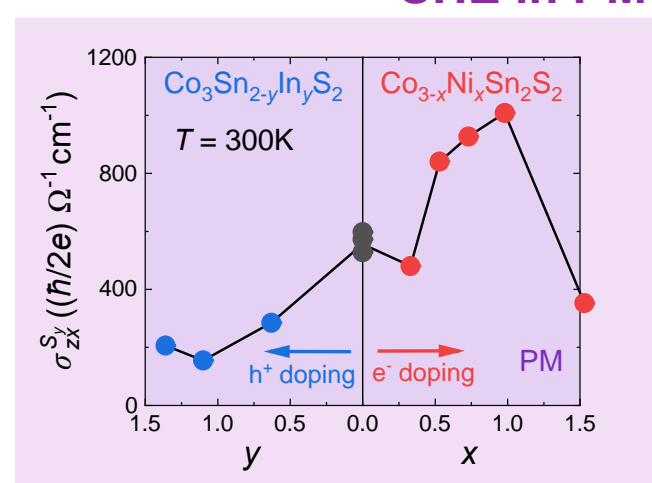


Phys. Rev. B 2023  
Editor's suggestion

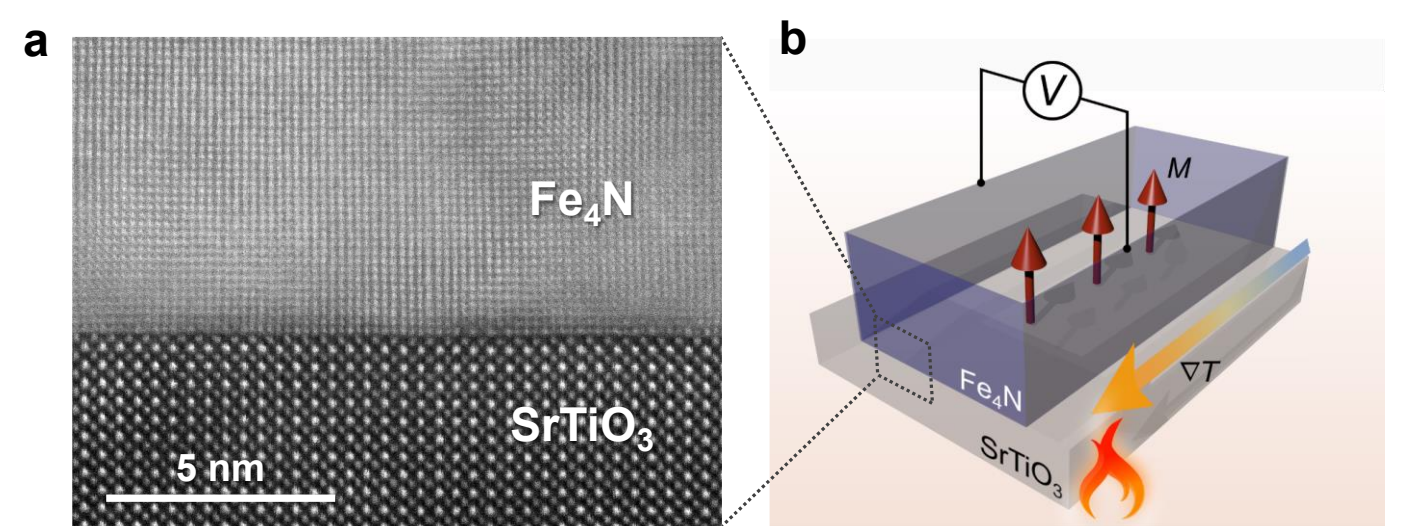
#### AHE in FM



#### Crossing T<sub>C</sub> SHE in PM



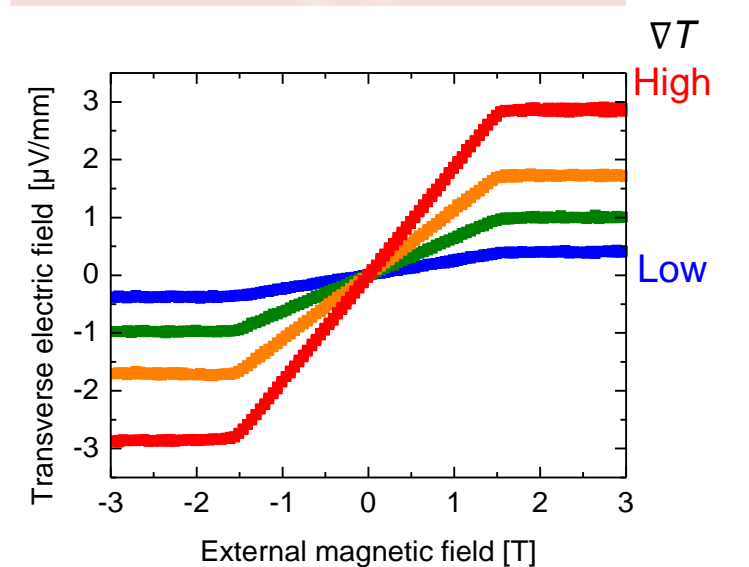
### Large anomalous Nernst effect material



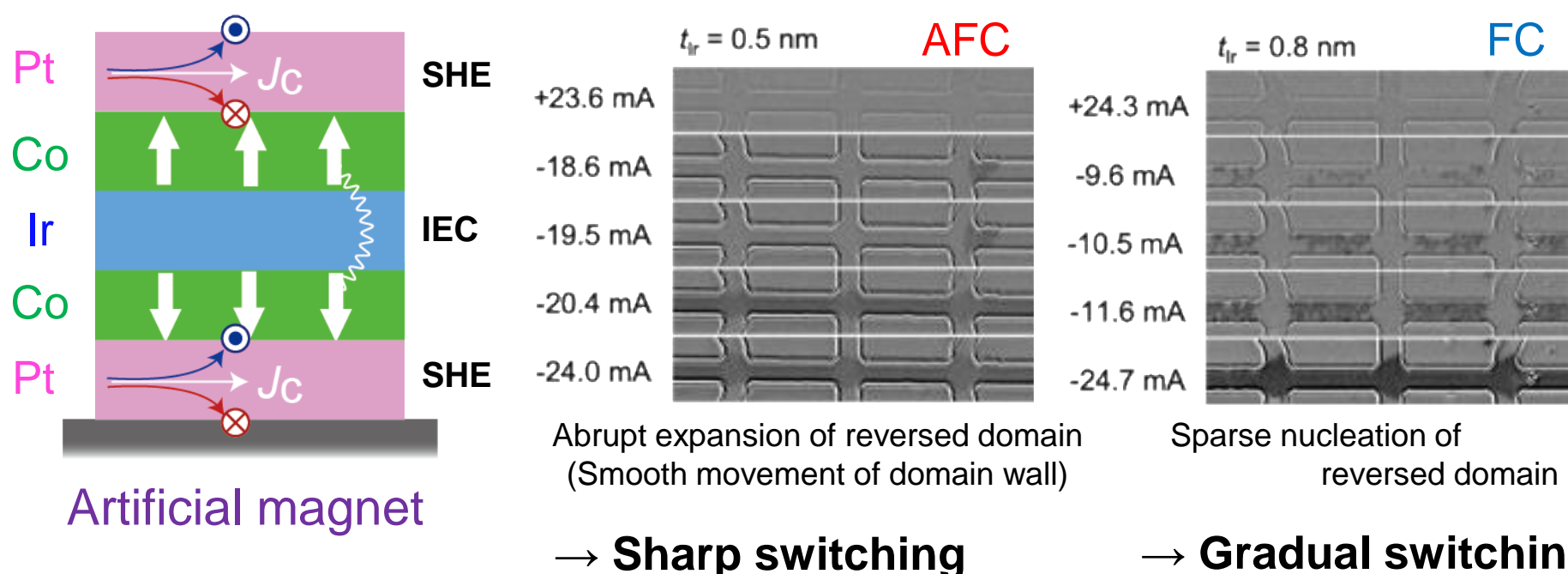
ユビキタス元素の鉄と窒素から構成される磁気熱電変換素子。a. Fe<sub>4</sub>Nエピタキシャル薄膜の透過電子顕微鏡像および b. その異常ネルンスト効果。

Magneto-thermoelectric conversion device consisting of ferromagnetic iron nitride (Fe<sub>4</sub>N). a. Transmission electron microscope image of Fe<sub>4</sub>N epitaxial thin film and b. its anomalous Nernst effect.

J. Appl. Phys. 2022



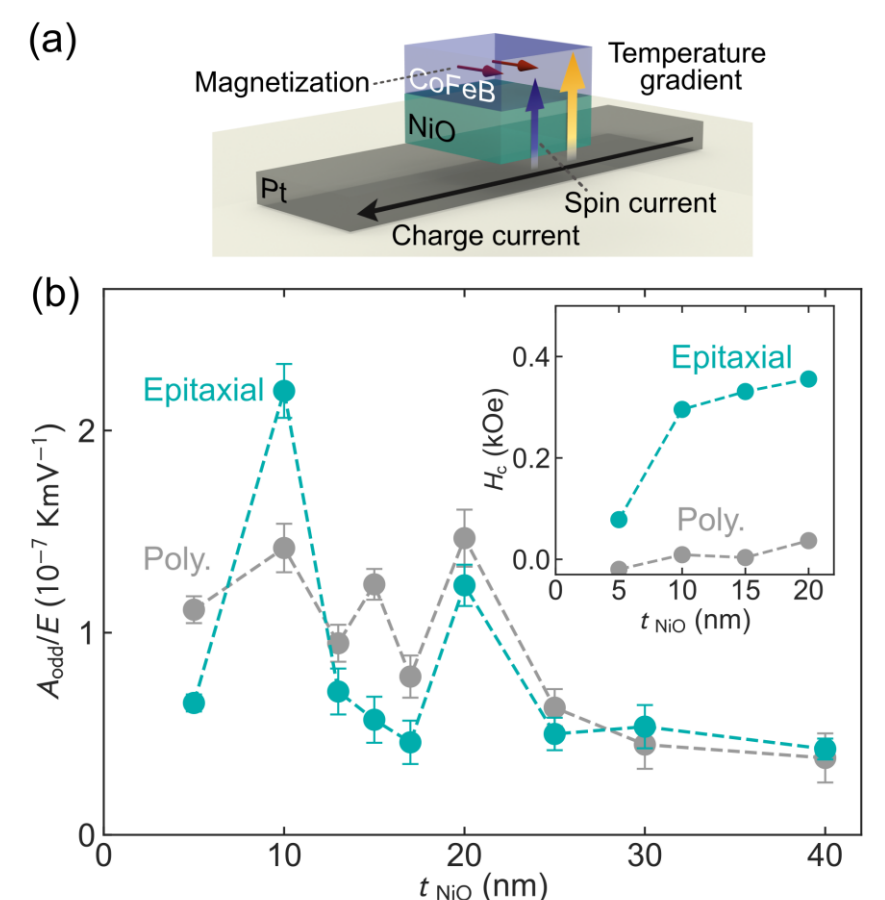
### Antiferromagnetic spintronic material



Antiferromagnetic coupling (AFC) is useful for stable / efficient device operation.

Appl. Phys. Lett. 2023

### Spin current transmission material



Appl. Phys. Express 2023