



IFMP Seminar

Date Tuesday, October 25, 2022, at 14:50

REC/C213

BigBlueButton:

<https://selfservice.zih.tu-dresden.de/link.php?m=188418&p=9818cedb> (TUD)

<https://selfservice.zih.tu-dresden.de/link.php?m=188418&p=9517a07e> (External)

Speaker **Arnab Bose**

Johannes Gutenberg Universität Mainz

Title **Generation of electric-field-induced unconventional spin current**

Abstract Efficient generation of spin current is one of the primary goals of spintronics. In the first part, I shall talk about the electric-current-driven unconventional spin-current generation [1] using the novel spin-split bands of altermagnet RuO₂ [2], which could be a potential root to achieve the field-free switching of perpendicular magnet for high-density memory applications. In the next part of my talk, I shall discuss our recent results of thermal generation of spin current due to the spin Nernst torque of heavy metals such as Pt and W [3], which could be useful for energy harvesting spin-caloritronic research applications.

[1] A. Bose, N. J. Schreiber, R. Jain, D.-F. Shao, H. P. Nair, J. Sun, X. S. Zhang, D. A. Muller, E. Y. Tsymbal, D. G. Schlom, and D. C. Ralph, *Tilted Spin Current Generated by the Collinear Antiferromagnet Ruthenium Dioxide*, Nat. Electron. **5**, 267 (2022).

[2] R. González-Hernández, L. Šmejkal, K. Výborný, Y. Yahagi, J. Sinova, T. Jungwirth, and J. Železný, *Efficient Electrical Spin Splitter Based on Nonrelativistic Collinear Antiferromagnetism*, Phys. Rev. Lett. **126**, 127701 (2021).

[3] A. Bose, R. Jain, J. J. Bauer, R. A. Buhrman, C. A. Ross, and D. C. Ralph, *Origin of Transverse Voltages Generated by Thermal Gradients and Electric Fields in Ferrimagnetic-Insulator/Heavy-Metal Bilayers*, Phys. Rev. B **105**, L100408 (2022).

Host: H. Reichlova