

Spin and chirality- opportunities and challenges

R. Naaman

*Dep. of Chemical and Biological Physics, Weizmann
Institute, Rehovot. Israel*

The chiral induced spin selectivity (CISS) effect was discovered more than two decades ago, but its studies keep producing interesting and sometimes unexpected results. Among them the role of chiral phonons in the effect [1] and the ability to transfer spin information through chiral materials using those phonons [2]. Other findings, discovered very recently, have to do with the ability to pump heat using CISS and the coherent properties of electrons passing through chiral systems. Some of these effects will be presented and discussed in relation to the mechanism of the CISS effect.

[1] T. K. Das, R. Naaman, J. Fransson, Insights into the Mechanism of Chiral-Induced Spin Selectivity: The effect of Magnetic Field Direction and Temperature, *Adv. Mat.*, 2313708 (2024).

[2] K. Ohe, H. Shishido, M. Kato, S. Utsumi, H. Matsuura, Y. Togawa, Chirality-Induced Selectivity of Phonon Angular Momenta in Chiral Quartz Crystals, *Phys. Rev. Lett.* **132**, 056302 (2024)