

DS 30: Invited Koopmans

Time: Thursday 9:30–10:15

Location: H2

Invited Talk

DS 30.1 Thu 9:30 H2

Spin in organics, a new route to spintronics — ●BERT KOOPMANS — Department of Applied Physics, Eindhoven University of Technology, Eindhoven, The Netherlands

Organic spintronics aims at new device functionality by combining the field of magneto- or spinelectronics with that of organic or plastic electronics. In hybrid organic spin-valves, an organic semiconducting film is sandwiched between two ferromagnetic thin films, aiming at magnetoresistive effects that exploit the long spin relaxation time of organic

materials. Alternatively, organic magnetoresistance (OMAR) has been observed in devices without any ferromagnetic components, displaying up to 30% at room temperature, and at relatively small magnetic fields (5 mT). In this presentation, I will introduce this novel OMAR effect, and show that it provides us with entirely new physics, combining ‘spin blocking’ mechanisms with specific features of the behaviour of devices operating in bipolar space-charge limited current regime. Finally it will be shown that weak hyperfine fields from the hydrogen atoms in the organic materials are crucial for a proper understanding of both OMAR and organic spin valves.