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**HL 54: Invited Talk Hübner**

Time: Friday 11:00–11:45

Location: HSZ 01

**Invited Talk** HL 54.1 Fri 11:00 HSZ 01  
**Spin Noise Spectroscopy in Semiconductor Nanostructures** —

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The aim towards semiconductor spin devices and spin quantum information processing drives the current intense research on semiconductors spintronics. Spin noise spectroscopy in semiconductors (SNS) is a new powerful method to reveal the spin related physical processes of a wealth of semiconductor systems [1]. Known from quantum optics as quantum non-demolition measurement, SNS is in particular capable to

unravel the intrinsic spin dynamics without disturbing influences. SNS measurements at low temperatures on weakly n-doped bulk GaAs yield for example spin lifetimes up to 260 ns, which has been masked before by carrier heating and spin relaxation by holes. In two dimensional systems like n-doped 110-GaAs quantum wells, SNS is capable to distinguish between intrinsic and extrinsic spin dephasing mechanisms like, e.g., pure dephasing and time of flight broadening resulting from the electron motion [2]. SNS can be as well applied to zero dimensional systems like quantum dots or impurity bound carriers.

[1] M. Oestreich, M. Römer, R. J. Haug, and D. Hägele, *Phys. Rev. Lett.* **95**, 216603 (2005).

[2] G. Müller, M. Römer, D. Schuh, W. Wegscheider, J. Hübner, and M. Oestreich, *Phys. Rev. Lett.* **101**, 206601 (2008).