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Manipulation of spin transfer torque using light¹ MASSIMO RONTANI, KARSTEN VENDELBJERG, CNR-NANO Research Center S3, Modena, Italy, LU SHAM, Dept of Physics, University of California San Diego — We show that the spin transfer torque induced by a spin-polarized current on a nanomagnet as the current flows through a semiconductor-nanomagnet-semiconductor junction is externally controlled by shining the junction off-resonantly with a strong laser beam. The excitonic coherence driven by the laser dresses the virtual electron-hole pairs coupling conduction and valence bands and inducing an evanescent state in the proximity of the nanomagnet. The Fano-like quantum interference between this localized state and the continuum spectrum is different in the two spin channels and hence it dramatically alters the spin transport, leading to the coherent control of the spin transfer torque.

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Massimo Rontani
CNR-NANO Research Center S3, Modena

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