

# **Directional Spontaneous Emission and Lateral Casimir-Polder Force on an Atom Close to a Nanofiber**

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Casimir-Polder interactions between atoms and macroscopic bodies acquire lateral components as soon as the translational invariance of the body surface is broken via periodic corrugations or disorder. In my talk I will describe an alternative route to lateral forces by exploiting the directional spontaneous emission of an atom near a nanofiber [1]. Here, the asymmetric emission of an atom results in a translationally invariant lateral force that derives from the resonant part of the quantum Lorentz force. This type of lateral force is generic in the sense that it also exists in other geometries [2].

## **References**

- [1] S.Scheel, S.Y.Buhmann, C.Clausen, and P.Schneeweiss, Phys. Rev. A 92, 043819 (2005).
- [2] F.J. Rodriguez-Fortuno, A.Martinez, N.Engheta, and A.V.Zayats, arXiv:1504.03464.