qPlus, quo vadis?

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The qPlus sensor, a self-sensing piezoelectric quartz cantilever with a stiffness of about 1kN/m has reunited STM and AFM [1]. The qPlus sensor can be operated at oscillation amplitudes less than one Angstrom such that STM and AFM can be performed simultaneously and its large size enables to be easily outfitted with etched metal tips known from STM. Joachim Welker has designed a cover for the Apr 27 issue of *Science* in 2012 that captures this "dual view" of qPlus based STM/AFM. The gray veil shows the inverted STM current, while the colored surface shows the force signal between a CO molecule adsorbed on a Cu (111) surface and a single atom metal tip [2]. In 2009, Gross et al. had demonstrated that terminating the tip with a CO molecule leads to a drastic enhancement of resolution and to image organic molecules with atomic resolution [3]. This practice has been adapted widely in the community. The talk discusses other developments that might open new avenues for the broader community.

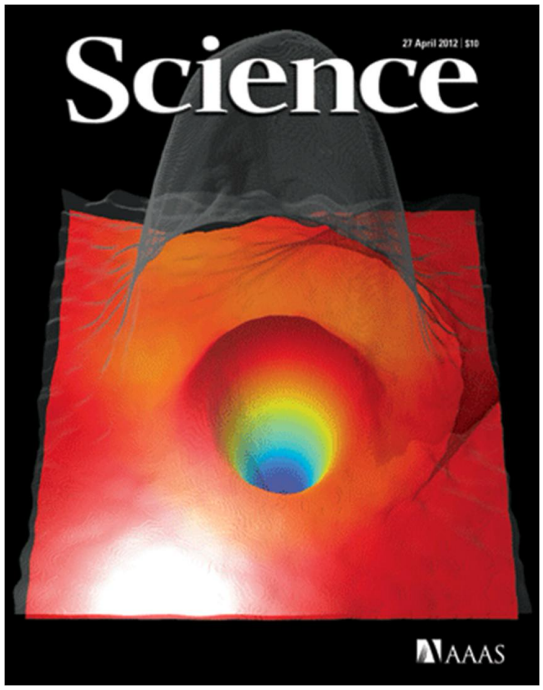

Figure 1. Cover for the Apr 27 issue of *Science* in 2012, showing the inverted tunneling current (gray veil) and the force (colored surface) between a single atom metal tip and CO/Cu(111).

References

[1] F.J. Giessibl, *Rev. Sci. Instrum*. **91**, 1001001 (2019).

[2] J. Welker, F.J. Giessibl, *Science* **336**, 444 (2012).

[3] L. Gross, F. Mohn, N. Moll, P. Liljeroth, G. Meyer, *Science* **325**, 1110 (2009).