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**Superconductivity and planar hole densities in the cuprates from NMR** JUERGEN HAASE, MICHAEL JURKUTAT, University of Leipzig, DAMIAN RYBICKI, AGH University of Science and Technology — We show how nuclear magnetic resonance (NMR) of  $^{63}\text{Cu}$  and  $^{17}\text{O}$  provides a quantitative measure of the charge distribution in the ubiquitous  $\text{CuO}_2$  plane, the common structural feature of cuprate physics. The various materials are found to differ significantly in the local charge distribution, while the total charge per  $\text{CuO}_2$  matches expectation from stoichiometry. Using the local charges on Cu and O measured by NMR, a new three-dimensional cuprate phase diagram is drawn that consistently encompasses all cuprate materials. These appear ordered according to their maximum  $T_c$ . It is the sharing of the inherent Cu hole with O that sets an upper limit for  $T_c$ , and it correlates with the superfluid density measured by  $\mu\text{SR}$ , over all cuprate families.

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