

Abstract Submitted
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Recent developments in the physics of your sense of smell¹ ANDREW HORSFIELD, Imperial College London, LUCA TURIN, MIT, YEONG-AH SOH, Imperial College London, MARION SOURRIBES, MARSHALL STONEHAM, LIANHENG TONG, PAUL WARBURTON, UCL — A radical proposal in 1996 [L. Turin, *Chem. Senses* 21, 773 (1996)] was that human olfactory receptors use phonon assisted electron tunnelling to probe the vibrational spectrum of odorants in order to determine their chemical identity. A development of this model [J. C. Brookes et al., *Phys. Rev. Lett.*, 98, 038101 (2007)] showed that this Turin mechanism is indeed physically possible, even robust, but left a number of questions open. One such question is: between which sites does the tunnelling electron pass? Our recent calculations support a particular pair of likely sites. Because of the complexity of biological environments, probing the receptor is difficult. Thus we have begun to investigate the properties of a semiconductor nanowire device that mimics the key processes [A. P. Horsfield et al., *J. Appl. Phys.*, 108, 014511 (2010)]. We will present the latest findings of this study.

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