

Rasmita Raval

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Rasmita Raval is Professor of Chemistry and Director of the Surface Science Research Centre at the University of Liverpool. Her research focuses on 'bottom-up' assembly of complex molecular architectures at surfaces and the concurrent development and utilisation of surface spectroscopic and scanning probe techniques to elucidate the nature of nanoscale organisations at the atomic and molecular scale. This experimental effort has been combined with collaborations with leading theoreticians to yield nanoscale insights on the nature and driving forces for molecular assembly at surfaces. Her seminal work on chiral surfaces reported the world's first example of a truly homochiral surface created from the supramolecular assembly of molecules at a metal surface [1]. She has subsequently mapped the multifarious aspects of molecular assembly at surfaces including: hierarchical transfer of chiral information from the nanoscale to the macroscale, the polymorphic manifestation of symmetry-breaking in 2-dimensions and single-molecule chiral recognition events [1-6]; recording the first molecule-by-molecule mapping of organised amino-acid layers pinpointing individual conformations, chirality and adsorption footprints within an assembly [7-9]; outlining simple rules that lead to the emergence of complexity in surface chirality [10]; and demonstrating the drastic non-linear behaviour in self-organisation of chiral molecules, driven by fluctuation in relative enantiomer populations [11]. Recent work has focussed on 'on-surface synthesis' of complex covalent matter at surfaces via simple C-H activation, demonstrating homo- and hetero-coupling of a wide variety of molecular building blocks [12-17]; simple molecular walkers at a surface [18], and designing antimicrobial surfaces.

Selected Highlighted Publications:

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- [5] J. Carrasco, A.Michaelides, M. Forster, S. Haq, R. Raval and A. Hodgson, *Nature Materials*, 8 (2009) 427.
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- [7] M. Forster, M. Dyer, M. Persson and R.Raval, *J. Am. Chem. Society*, 2009 (131) 10173.
- [8] M. Forster, M. Dyer, M. Persson, R.Raval, *Angewandte Chemie Int. Ed*, 49 (2010) 2344.
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- [11] S.Haq, N. Liu, V.Humblot. A.P.J.Jansen, R.Raval, *Nature Chemistry*, 1 (2009) 409.
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- [13] M. Dyer. A.Robin, S. Haq, R.Raval, M.Persson, J.Klimes, *ACS Nano*, 5 (2011) 1831.
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- [16] S Haq, F Hanke, M Persson, D B. Amabilino and R Raval, *ACS Nano*, 8 (2014) 8856-8870.
- [17] Andrea Floris, Sam Haq, Mendel In't Veld, David B. Amabilino, Rasmita Raval, and Lev Kantorovich *J. Am. Chem. Society*, 2016, DOI: 10.1021/jacs.5b11594.
- [18] S Haq, B Wit, H Sang, A Floris, Y Wang, J Wang, L Pérez-García, L Kantorovitch, D B. Amabilino, R Raval, *Angewandte Chemie Int. Ed.* 2015, DOI: 10.1002/anie.201502153.