



## David L. Patrick

Professor of Chemistry  
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### Education

B.S. Chemistry, University of California at Davis (1990).

Ph.D. University of Utah (1995).

NSF Postdoctoral Fellow, Cambridge University (1995-6).

Visiting Fellow, Oxford University (2002-3).

### Selected Honors & Awards

Olscamp Research Award (2005)

Henry Dreyfus Teacher-Scholar Award (2001)

U.S. Presidential Early Career Award for Scientists and Engineers (2000)

Dreyfus Foundation New Faculty Start-up Grant (1996)

University of Utah Cheves T. Walling Graduate Research Award (1995)

American Vacuum Society Graduate Student Award (1994)

Union Carbide Corp. Kenan Analytical Chemistry Award (1993)

### Selected Professional Service

Chair, Pacific Northwest Chapter of the American Vacuum Society (2004-)

Organizing Committee Member, National Academy of Sciences / Alexander von Humboldt GAFOS symposium series (2002-5)

Reviewer for numerous journals and funding agencies

Over 15 invited talks since 2000.

### Research Interests

Patrick specializes in surface and materials chemistry, ordered molecular systems, and nanoscience. His recent work includes investigations into the use of nematic liquid crystal solvents combined with electric and magnetic fields to prepare materials with engineered nanoscale structure and organization. This work has resulted in novel approaches for ordering carbon nanotubes and related particles, enabling their integration into planar device architectures with unprecedented control and simplicity. Highlights of this research include development of a method for growing crystalline films of organic semiconductor compounds using liquid crystal solvents which allows full control over crystallographic orientation and produces crystallites an order of magnitude larger than is possible by other means. Related recent work includes studies of the molecular-scale origins of surface memory effects at liquid crystal – solid interfaces using scanning tunneling and atomic force microscopies, and computational studies of interfacial chirality in molecular fluids. Patrick has received over \$1.5M in external research support, and his scholarship has been recognized with several prestigious grants and national awards.

### Teaching Interests

His educational activities focus on the involvement of undergraduates in research, and teaching in the areas of analytical and general chemistry. He has updated the undergraduate analytical chemistry curriculum at WWU by reforming course contents, systematically introducing modern instrumentation at all levels (freshmen to seniors), and including more open ended, discovery-based experiments.

### Representative Publications & Patents

"Getting Organized at the Nanoscale with Thermotropic Liquid Crystal Solvents", D. L. Patrick, F. Scott Wilkinson, T. L. Fegurgur, Proc. SPIE, in press (2005).

"Controlled symmetry breaking to grow chiral films from achiral molecules", A. Berg\*, D. L. Patrick, *Angew. Chemie Int. Ed.*, **43**, 1744 (2005).

"Controlling the Orientation of Micron-Sized Rod-Shaped SiC Particles with Nematic Solvents", M. D. Lynch#, D. L. Patrick, *Chem. Mater.*, **16**, 762 (2004).

Organizing Carbon Nanotubes with Liquid Crystal Solvents, M. Lynch, D. L. Patrick, *Nanolett.*, **2**, 1197 (2002).

Formation of Uniaxial Molecular Films by Liquid Crystal Imprinting in a Magnetic Field, J. D. Mougous, A. J. Brackley, K. Foland, R. T. Baker, D. L. Patrick *Phys. Rev. Lett.* **84**, 2742 (2000).

'Molecule Corrals' for Studies of Monolayer Films, D. L. Patrick, V. J. Cee and T. P. Beebe, Jr., *Science* **265**, 231 (1994).

U.S. Patent No. 6,723,396. D. L. Patrick, assigned to WWU. (2004)

U.S. Patent No. 6,858,270. D. L. Patrick, assigned to WWU. (2005)

