

# NanoManipulator™ Publication List

Below is a partial list of published articles about the NanoManipulator system and its various applications.

Measurements of torsion in multi-walled carbon nanotubes, P. A. Williams, S.J. Papadakis, A. M. Patel, M.R. Falvo, S. Washburn, R. Superfine. *Physical Review Letters* 89(25): 25502-1 -25502-4

Liu, W., Jawerth, L. M., Sparks, E. A., Falvo, M. R., Hantgan, R. R., Superfine, R., Lord, S. T., Guthold, M., (2006) "Fibrin Fibers have Extraordinary Extensibility and Elasticity" *Science* 313 (5787): 634 (2006)

Peng, L., Stephens, B. J., Bonin, K., Cubicciotti, R., Guthold, M., (2006) "NanoSelection® – a Novel, Single-Cycle Method to Select Individual Aptamer Species from a Small Pool of Random Oligonucleotides" *Journal for Nanoscience and Nanotechnology* (submitted)

Guthold, M., Liu, W., Stephens, B. J., Lord, S. T., Hantgan, R. R., Erie, D. A., Taylor, R. M., Superfine, R. (2004) "Visualization and Mechanical Manipulations of Individual Fibrin Fibers Suggest that Fiber Cross-Section has Fractal Dimension 1.3" *Biophys. J.* 87, 4226-36

Controlled placement of an individual carbon nanotube onto a microelectromechanical structure, P. A. Williams, S.J. Papadakis, M. R. Falvo, A. M. Patel, M. Sinclair, A. Seeger, A. Helser, R. M. Taylor II, S. Washburn and R. Superfine, *Applied Physics Letters* 80(14): 2574-2576 (2002).

Nanomanipulation: Buckling, Transport and Rolling at the Nanoscale. R. Superfine, M. Falvo, R. M. Taylor II and S. Washburn, In: *CRC Handbook of Nanoscience, Engineering, and Technology*. Ed. S. Lyshevski, D. Brenner, J. Lafrate and W. Goddard. Boca Raton, CRC Press LLC, (2002)

"Hands-on tools for nanotechnology", A. Seeger, S. Paulson, M. Falvo, A. Helser, R.M. Taylor II, R. Superfine, S. Washburn, *J. Vac. Sci. Technol. B* 19(6), pp 2717-2722, Nov/Dec 2001.

"Tunable resistance of a carbon nanotube-graphite interface", S. Paulson, A. Helser, M. Buongiorno Nardelli, R. M. Taylor II, M. Falvo, R. Superfine, S. Washburn, *Science*, 290, 1742-1744. (2000) ([PDF](#))

Guthold, M., Falvo, M. R., Matthews, W. G., Paulson, S., Washburn, S., Erie, D., Superfine, R., Brooks, F. P. and Taylor, R. M. "Controlled Manipulation of Molecular Samples with the nanoManipulator." *IEEE/ASME Transactions on Mechatronics*, June, 2000.

Foubert, P., Vanoppen, P., Martin, M., Gensch, T., Hofkens, J., Helser, A., Seeger, A., Taylor, R.M., Rowan, A.E., Nolte, R.J.M., and De Schryver, F.C. "Mechanical and optical manipulation of porphyrin rings at the submicrometre scale." *Nanotechnology* 11 (2000) 16-23.

Weigle, Christopher, William G. Emigh, Geniva Liu, Russell M. Taylor II, James T. Enns, and Christopher G. Healey. "Oriented Texture Slivers: A Technique for Local Value Estimation of Multiple Scalar Fields." To appear in *Proceedings Graphics Interface 2000* (Montreal, Canada), May 2000.)

Paulson, S., M. R. Falvo, N. Snider, A. Helser, T. Hudson, A. Seeger, R. M. Taylor, R. Superfine, and S. Washburn. "In situ resistance measurements of strained carbon nanotubes." November 8, 1999, *Applied Physics Letters*, Volume 75, Number 19, pp. 2936 - 2938.

Jones, M.G., Superfine, R., Taylor, R., "[Virtual Viruses](#)," *Science Teacher*, Vol. 66, No. 7, October 1999. pp. 48-50.

Falvo, M., Taylor II, R. M., Helser, A., Chi, V., Brooks Jr., F. P., Washburn, S. and Superfine, R. "Rolling and Sliding on the Nanometer Scale," January 21, 1999, *Nature*, 397 pp.236-238.

Falvo, M. R., Steele, J., Buldum, A., Schall, D., Taylor, R., Lu, J. P., Brenner, D. and Superfine, R. (1999). "Atomic lattices can act like gears." *Nature* submitted.

Guthold, M., Erie, D., Craig, L., Tainer, J., Mullin, J., Lord, S., Superfine, R. & Taylor, R. (1999). "Controlled Manipulation and Imaging of Biological Molecules." *nc-AFM'99, Pontresina, Switzerland*.

Guthold, M., Falvo, M., Matthews, W. G., Paulson, S., Negishi, A., Washburn, S., Superfine, R., Brooks, F. P. and Taylor, R. M. (1999). "Investigation and Modification of Molecular Structures Using the NanoManipulator." *J Mol. Graphics Mod.* 17, 187 - 197.

Guthold, M., Matthews, W. G., Taylor, R. M., Erie, D., Brooks, F. P. and Superfine, R. (1999). "Quantitative manipulation of DNA in liquid with the nanoManipulator scanning force microscope." *Biophysical Society 43rd annual meeting, Feb. 13-17, 1999, Baltimore, MD; Biophys. J.* 76 A351.

Matthews, W. G., Negishi, A., Seeger, A., Taylor, R., McCarty, D. M., Samulski, R. J. and Superfine, R. (1999). "Elasticity and binding of adenovirus in air and in liquid." *Biophysical Society 43rd annual meeting, Feb. 13-17, 1999, Baltimore, MD; Biophys. J.* 76, A265.

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"Nanomanipulation Experiments Exploring Frictional and Mechanical Properties of Carbon Nanotubes," Falvo, M., Clary, G., Helser, A., Paulson, S., Taylor II, R. M., Chi, V., Brooks Jr., F. P., Washburn, S. and Superfine, R. (1999) *Microscopy and Microanalysis*, 4(5) 4(5),pp. 504-512.

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Robinett, Warren, "Switching Among the Four Modes of a Teleoperator System: Teleoperation, Simulation, Replay and Robot," *International Conference on Artificial Reality and Tele-existence*, Tokyo, Japan, December 1998.

Glenn C. Ratcliff, Dorothy A. Erie, and Richard Superfine(1998) "Photothermal oscillation for oscillating mode atomic force microscopy in solution" *Appl. Phys. Lett.* 72(15), pp. 1911-1913

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paper was reprinted in the proceedings of *Imagina '94* and reprinted in Italian in the October 1993 issue of *VIRTUAL* magazine.

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#### **Other descriptions of the work**

The thesis of Matthias von der Hardt from Institut fuer Werkzeugmaschinen und Betriebstechnik Universitaet Karlsruhe (TH) contains a section about the Nanomanipulator. This thesis is in German.

Depaemelaere, Sigrid, "'Virtual reality' technologie in 'scanning probe' microscopie laat 'real time' manuele controle van de microscooptip toe en leidt tot een kwalitatieve verbetering van de experimenten," annex thesis at the Katholieke Universiteit Leuven Faculteit Der Wetenschappen [Departement Scheikunde Afdeling voor Fotochemie en Spectroscopie](#), 1997. This thesis is in Dutch.

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