Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Electrospun Nanofiber Yarn
SPHURTI DOIPHODE, DARRELL RENEKER, The Maurice Morton Institute of Polymer Science, The University of Akron — Electrospinning creates an electrically charged jet of polymer solution or melt, which elongates dries and solidifies to give very long fibers with nanometer-scale diameters [1]. The yarn manufacturing method [2,3] involves collecting the electrically charged fibers between two parallel and electrically grounded collector surfaces separated by a distance commensurate with the diameter of the loops formed by the electrically driven bending instability [1]. One of the collector surfaces is rotated around its axis at an appropriate rate to twist the fibers into a nanofiber yarn. The yarn was extended, for example by translating the other collector away from the rotating collector. Properties such as yarn diameter, fiber count, and twist per unit length were controlled by changing the rotation rate of the disk. It appears that yarns of nanofibers can be produced from all polymer solutions that can be electrospun.

References:

Sphurti Doiphode
The Maurice Morton Institute of Polymer Science, The University of Akron

Date submitted: 01 Dec 2005