## Presentation Title:

Graphene-based, Graphene-derived, and new Carbon Materials

## Authors:

Rodney S. Ruoff

## Affiliation:

Cockrell Family Regents Chair
Department of Mechanical Engineering and the Materials
Science and Engineering Program
The University of Texas at Austin
http://bucky-central.me.utexas.edu/publications/index.html
Email: r.ruoff@mail.utexas.edu

## Abstract:

Graphene-based materials are promising because of their electronic and thermal transport, mechanical properties, high specific surface area, that they can act as an atom thick layer, barrier, or membrane, among other reasons. (Our micromechanical exfoliation approaches [1,2] conceived of in 1998 yielded multilayer graphene and one paper described in detail how monolayer graphene could be obtained [1]). In addition to describing some of our recent work on graphene, I will also discuss new materials as yet not made that are important targets for materials synthesis: (i) the negative curvature carbons [3,4] and their likely applications, and (ii) ultrathin and large area $\mathrm{sp}^{3}$ carbon films [4].
Support of our work on graphene by the W. M. Keck Foundation, NSF, DARPA ‘iMINT’, DARPA ‘CERA', ONR, SWAN NRI, ARO, AEC, and the SRC, is greatly appreciated.

## References

1. Lu XK, Yu MF, Huang H, and Ruoff RS, Tailoring graphite with the goal of achieving single sheets, Nanotechnology, 10, 269-272 (1999).
2. Lu XK, Huang H, Nemchuk N, and Ruoff RS, Patterning of highly oriented pyrolytic graphite by oxygen plasma etching, Applied Physics Letters, 75, 193-195 (1999).
3. Zhu, Yanwu; Murali, Shanthi; Stoller, Meryl D.; Ganesh, K. J.; Cai, Weiwei; Ferreira, Paulo J.; Pirkle, Adam; Wallace, Robert M.; Cychosz, Katie A.; Thommes, Matthias; Su, Dong; Stach, Eric A.; Ruoff, Rodney S. Carbon-Based Supercapacitors Produced by Activation of Graphene. Science 332, 1537-1541 (2011).
4. Ruoff, Rodney S. Personal perspectives on graphene: New graphene-related materials on the horizon. MRS Bulletin 37, 1314-1318 (2012).
