Meeting: 1003, Atlanta, Georgia, WIGDERSON, AMS Invited Address

1003-68-3 **Avi Wigderson***, Institute for Advanced Study, School of Mathematics, Einstein Drive, Princeton NJ 08540. *The power and weakness of randomness (when you are short on time).*

Man has grappled with the meaning and utility of randomness for centuries. Research in the Theory of Computation in the last 30 years has enriched this study considerably. I will talk about two main aspects of this research on randomness, demonstrating its power and weakness respectively.

(1) Randomness is paramount to computational efficiency. I will show how the use of randomness can dramatically speed up computation (and do other wonders) for a variety of problems and settings.

(2) Computational efficiency is paramount to understanding randomness. I will explain the new, computationally-motivated definition of randomness, and try to argue its merits as the "right" definition. I will then show how such randomness may be generated deterministically, from computationally difficult problems. (Received March 22, 2004)