

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Statistical regularities in the rank-citation profile of individual scientists ALEXANDER PETERSEN, H. EUGENE STANLEY, Boston University, SAURO SUCCI, Istituto Applicazioni Calcolo C.N.R. — Citation counts and paper tallies are ubiquitous in the achievement ratings of individual scientists. As a result, there have been many recent studies which propose measures for scientific impact (e.g. the h -index) and the distribution of impact measures among scientists. However, being just a single number, the h -index cannot account for the full impact information contained in an author's set of publications. Alternative "single-number" indices are also frequently proposed, but they too suffer from the shortfalls of not being comprehensive. In this talk I will discuss an alternative approach, which is to analyze the fundamental properties of the *entire* rank-citation profile (from which all single-value indices are derived). Using the complete publication careers of 200 highly-cited physicists and 100 Assistant professors, I will demonstrate remarkable statistical regularity in the functional form of the rank-citation profile $c_i(r)$ for each physicist $i = 1...300$. We find that $c_i(r)$ can be approximated by a discrete generalized beta distribution over the entire range of ranks r , which allows for the characterization and comparison of $c_i(r)$ using a common framework. Since two scientists can have equivalent h_i values while having different $c_i(r)$, our results demonstrate the utility of a scaling parameter, β_i , in conjunction with h_i , to quantify a scientist's publication impact.

Alexander Petersen
Boston University

Date submitted: 18 Nov 2010

Electronic form version 1.4