

The Dr A.H. Heineken Prize for Environmental Sciences 2004

The work of Professor Simon A. Levin presented by Professor Johan Bouma, Chair of the Jury of the Dr A.H. Heineken Prize for Environmental Sciences

Prize citation: for 'his insights into the effects of scale on ecosystems'.

Your Royal Highness,

Your Excellencies,

Members of the Board of the Heineken Foundation

and the Alfred Heineken Fondsen Foundation, in particular their Chair, Ms De Carvalho,

Distinguished laureates,

Ladies and gentlemen,

Professor Levin,

The jury of the 2004 Dr A.H. Heineken Prize for Environmental Sciences has unanimously decided to select you as the recipient of this award because of your highly significant, pioneering research on Ecosystem Dynamics. Ecosystems are dynamic biological communities that inhabit specific areas and are continuously affected by internal and external processes in space and time. Your particular contribution involves the application of rigorous mathematical complexity theory and analytical modeling to increase our basic understanding of the way in which ecosystems function at different spatial scales, ranging from the experimental plot to the landscape and beyond. You have shown that many of the properties of ecosystems vary according to fixed patterns, and that we can only understand what is going on at a particular spatial scale when we also understand what is happening at higher and lower scale levels. Your insights, which were generated by a fruitful combination of theory and empiricism, have led to fundamental changes in the discipline of ecology, which until the early nineties was strongly subdivided into various, rather independent subdisciplines. Your article, "The Problem of Pattern and Scale in Ecology," became the most cited work in this field in the nineties.

You are an exceptionally active and productive scientist. Your CV runs to dozens of pages and only lists significant achievements, no trivia. Your many publications include the 4800-page *Encyclopedia of Biodiversity*, of which you are Editor-in-Chief. Your qualities have been widely recognized. For example, you became a member of the American National Academy of Sciences in the year 2000, and you were presented with the Akira Okubo Lifetime Achievement Award in 2001. You are widely admired as a gifted speaker and excellent teacher with the rare ability to make your insights comprehensible to the general public. You also influence the international research agenda, for example as the chair of the Executive Committee of the International Institute for Applied Systems Analysis (IIASA), an interdisciplinary research institute based in Austria, which studies the human dimensions of global change.

A world that committed itself in Johannesburg in 2002 to sustainable development cannot achieve such worthy goals by good intentions alone. Research is needed to unravel the basic mechanisms of ecosystem dynamics, so as to allow the kind of understanding that is essential when judging actual conditions and when planning future developments. But there is more to consider than Ecosystem Dynamics by itself. Sustainable development can only be achieved when society at large is willing to embrace the challenges for the future, including the major economic and social factors that must also be considered when investigating ecosystems. Your ability to connect with

scientists of other disciplines, for example economics, evolutionary biology and immunology, is very important in this context and provides a clear channel to the practical study of biodiversity and nature conservation that are so important to society. You have in this way contributed to improving our understanding of the relationship between man and his environment, an important criteria for the Heineken Prize.

Some prizes have the character of a career award, serving as the final recognition of individual achievement. That is certainly not the case here. You are highly active and intend to remain so. Your work will not only go on making a significant contribution to science, but it will also, in particular, provide support for all those who are struggling to put the somewhat hazy concept of a sustainable world into practice. We hope to continue benefiting from your wisdom in the years ahead.