SNPD Prizes 2019

The **2019 EPS Statistical and Nonlinear Physics Prize** is awarded to

- **Sergio Ciliberto** "*for his seminal contributions over a wide range of problems in statistical and nonlinear physics, in particular for performing groundbreaking new experiments testing Fluctuation Theorems for injected power, dissipated heat, and entropy production rates, as well as investigating experimentally the connection between dissipated heat and the Landauer bound, thus demonstrating a link between information theory and thermodynamics.*"

  Sergio Ciliberto studied physics in Florence and was a researcher at the Istituto Nazionale Ottica in Florence 1982-1990. He also spent some time as a postdoctoral researcher and visiting scientist in Orsay, at the University of Pennsylvania (Haverford College), and at the Center of Nonlinear Studies at Los Alamos National Laboratory. In 1991 he was appointed at the Laboratoire de Physique at ENS Lyon, being the Director of the Lab from 2000-2006. Part of his research was supported by a large ERC grant with the title "Out of equilibrium fluctuations in confined phase transitions". From 2012-2014 he was Vice President of ENS Lyon in charge of research.

  Sergio Ciliberto is an outstanding experimentalist whose work had a profound impact on several areas of statistical and nonlinear physics. Over his scientific career, he has explored many very different physical systems, and was able to make very significant contributions over a wide range of problems. He has tested many innovative theoretical ideas in real physical situations, which led him to demonstrate the relevance of several deep concepts. He initially worked in quantum optics, then later he investigated order-chaos transitions in nonlinear systems, and worked in fluid turbulence, as well as on crack dynamics in heterogeneous materials and aging of amorphous materials. He then continued with his ground-breaking investigations on fluctuations of the injected and dissipated power in out-of-equilibrium systems. This was followed by his investigations of the connections between information theory and thermodynamics (experimental tests of the Landauer principle). Sergio Cliberto also performed one of the first measurements of Liapunov exponents from an experimental time series, at a time when this topic was entirely new in the scientific community.

- **Satya Majumdar** "*for his seminal contributions to non-equilibrium statistical physics, stochastic processes, and random matrix theory, in particular for his groundbreaking research on Abelian sandpiles, persistence statistics, force fluctuations in bead packs, large deviations of eigenvalues of random matrices, and applying the results to cold atoms and other physical systems.*"

  Satya Majumdar got his PhD in Physics in 1992 from the Tata Institute of Fundamental Research in Bombay, India. He then spent some time in the USA, first as a postdoctoral fellow at AT&T Bell Labs and then at Yale University. After returning to the Tata Institute as a faculty (1996-1999), in 2000 he was appointed as a CNRS scientist at the Université Paul-Sabatier (Toulouse, France), to be followed in 2003 by his appointment as Directeur de Recherche in CNRS at the University Paris-Sud, Orsay. Besides this, he also holds several honorary positions as an adjunct professor, at the Tata Institure in Bombay, at the Weizmann Institute in Rehovot, Israel, at the Higgs Centre of the University of Edinburgh, and at the Raman Research Institute in Bangalore, India.

  Satya Majumdar made outstanding contributions in many different subject areas of statistical physics, stochastic processes, and random matrix theory, with applications ranging from granular systems all the way to computer science and biology. His work is characterised by a very elegant mathematical analysis of physical problems, leading to a plethora of beautiful analytical results. These have provided deep insights into the underlying physics, but often also advance fundamental mathematical understanding. His work is probably almost as well known to probabilists and mathematical physicists as it is to statistical physicists. Some of his most important contributions are on self-organized criticality of sandpile models, on stress propagation in granular systems, on persistence and first-passage properties in nonequilibrium systems, on sorting and search problems in computer science, and on extreme value statistics of correlated random variables. His seminal work in random matrix theory has applications for growth models, biological sequence matching, conductance distributions in quantum dots, and much more.