

SNPD Prizes 2019

The **2019 EPS-SNPD Early Career Prize** is awarded to

- **Karel Proesmans** "*for his outstanding research contributions in the field of stochastic thermodynamics, in particular his work dealing with optimization protocols for thermal engines, as well as his work on thermodynamic uncertainty relations for discrete-time and periodically driven systems.*"

Karel Proesmans obtained his PhD in 2017 at the University of Hasselt for a thesis entitled 'Efficiency of stochastic engines', under the supervision of Bart Cleuren and Christian Van den Broeck. During his PhD work, he also collaborated with John Bechhoefer (Simon Fraser University). After his PhD he did a research visit of six months to the Collège de France in Paris under the supervision of Bernard Derrida and another one of three months to the University of Cambridge under the supervision of Daan Frenkel. Currently he is a Postdoctoral Researcher at Hasselt University.

Most of his work focuses on stochastic thermodynamics. One project is about stochastic efficiency, in which he, together with his collaborators, studies the general properties of the efficiency fluctuations in a thermodynamic system. In another work he has derived a framework to study the linear thermodynamics of time-dependent, stochastic systems. He showed that these systems should satisfy an Onsager-Casimir symmetry and looked at the implications on the performance of the engine (power output, efficiency, amount of dissipation). While these projects were mainly theoretical, the results have also been verified experimentally. He is also interested in the thermodynamic uncertainty relation and the properties of persistent random walks in higher dimensions.