



**EMMANUEL ROY**

*From France to Sweden*



Project: **Infinitely divisible dynamical systems**

Research topic: **Mathematics**

Swedish Institution: **Chalmers University of Technology**

French Institution: **Université Sorbonne Paris Nord**

Dates of mobility: **05/10/2023 to 13/10/2023**

Program: **SFVE-A**



## PRESENTATION

[Emmanuel Roy](#) has been Assistant Professor at [Sorbonne Paris Nord University](#) (formerly Paris 13) since 2006, in the "[Dynamical Systems and Ergodic Theory](#)" team of the [LAGA](#) (Laboratoire Analyse, Géométrie et Applications). His research revolves around a fundamental object of probability theory, the Poisson process. His work has shown that the ergodic theory specific to this object is extremely rich and occupies a singular place within the theory, notably through the canonical link it provides between ergodic theory in finite and infinite measure.

## ACTIVITIES IN SWEDEN

The purpose of his mobility in Sweden was a collaboration with [Michael Björklund](#) (Professor at [Chalmers](#), Gothenburg) and [Nachi Avraham Re'em](#) (Post-doctoral fellow under Michael Björklund's supervision). Nachi Avraham Re'em and Emmanuel Roy are finalizing an article on Boolean actions of Polish groups via Poisson Processes. They have established general ergodicity and weak mixing results. They apply these results to infinitely divisible stationary processes, providing a general solution to this question, which had hitherto only been dealt with by examples. This mobility program enabled the two to settle some difficult technical details in the proof of this last result. The article should be submitted for publication in the very near future. They also discussed the pursuit of jointly continuing to study more precisely the action of certain groups canonically associated with the Poisson process, for which rigidity phenomena are expected. Other questions on infinitely divisible systems were addressed by the three, including a construction through harmonic analysis that they were able to fully characterize as non-ergodic in the non-Gaussian case. They also discussed the general question of the existence of Central Limit Theorems for infinitely divisible systems, where only very partial and unsatisfactory results exist. Interesting results on this question can legitimately be expected, as key aspects were cleared up during the visit. Future joint investigations were envisaged.