

# PROB & PRST

## Details of the seminar

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Thursday, 3rd February  
English only

## Seminar of Probability and Stochastic Process

Thursday, 3rd February, from 11h15 to 12h15  
[MA A1 10](#), EPFL, Ecublens

[Dr. Nicolas Gast](#)

EPFL

## Fluid approximation of stochastic systems and differential inclusions

### Abstract:

Approximations of stochastic processes by ordinary deterministic differential equations (ODE) allows one to reduce the study of complex stochastic systems. This technique is broadly used in the computer science community to study the performance of large systems (via mean field models) or queuing networks (via fluid limits).

When the dynamic of the ODE is discontinuous, proving that the ODE is a good approximation of the stochastic system is often more challenging. In this talk, I will present how to handle this problem of discontinuity using differential inclusions. In particular, I will show that under an appropriate rescaling, the stochastic process converges to the solution of a differential inclusion. I will also show how this can be used to study the stability of certain scheduling heuristics used in wireless networks.

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