

# Mobilities from NSU to Ecole des Ponts ParisTech

for Spring 2018

for students  
presently following their M1  
in the “Mechanics and Mathematics”  
department

M. Vandamme

# Spring at Ecole des Ponts ParisTech

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- To work individually on a project (quasi-full time)
- Attendance to (and validation of!) a few classes required (classes taught in French).
- In the Applied Maths & Computer Science department of Ecole des Ponts ParisTech
  
- Brings no additional diploma
- Replaces the Spring semester of M1 in Russia
  
- From the beginning of February 2018 until June
  
- French not required: English sufficient (a bit difficult for classes, but manageable)

# Project at CERMICS (App. Maths lab)

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- Stochastic homogenization (variance reduction techniques for solving PDEs such as  $-\operatorname{div}(A \nabla u) = f$  with  $A$  random)
- Galerkin methods for computing the invariant measure of stochastic differential equations (solving the eigenvalue equation  $-Lu = \lambda u$  where  $L$  is the generator of the stochastic process under consideration)
- Discretization of stochastic differential equations arising in molecular dynamics
- Numerical methods for computational quantum physics

These internships all require familiarity with functional analysis and PDE theory (e.g. Sobolev spaces) as well as programming skills (C/C++, python). For some of them, some familiarity with basic probability theory (LLN, CLT) or stochastic differential equations is welcome.

# Finances

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- Erasmus+ stipends:
  - Transportation reimbursed up to 820€
  - Stipend of 850€/month while in France
- Cost:
  - Scholarity fees: 450€ for the semester
  - Social security: 217€
  - Liability insurance: 45€
  - Housing (if places available in cheapest dorm): about 300€/month (per person, in double room), plus 400€ caution, minus government support.
  - Transportation: 38€/month