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# BERN-FRIBOURG GRADUATE SEMINAR

a seminar for Master and PhD students

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Thursday 21<sup>st</sup> May, 2026: 16:15 - 17:00

Room B5, Exakte Wissenschaften, Bern

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## Navier-Stokes with a fractional transport noise as a limit of multi-scale dynamics

### **Abstract**

We analyse a slow/fast system describing a velocity field of a fluid evolving on a three-dimensional torus. The fast equation is a fractional Ornstein-Uhlenbeck process, driven by a fractional Brownian motion with  $H < \frac{1}{2}$ . We show that the limit points of the slow process are solutions to a Navier-Stokes equation driven by a transport fractional noise. The main challenges arise from the need to use rough path techniques in PDE problems to establish a suitable notion of solution, as well as showing suitable convergence of an additive functional of the fast process in the absence of the usual ergodic properties.