# Tempering the critical slowing down in pure gauge lattice QCD

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under the supervision of **Benoît Blossier**

# Academic journey

Grew up in Nîmes

Maths/Physics

Preparatory class in Toulouse

High energy physics

**2018-2022**
Polytechnique, Palaiseau

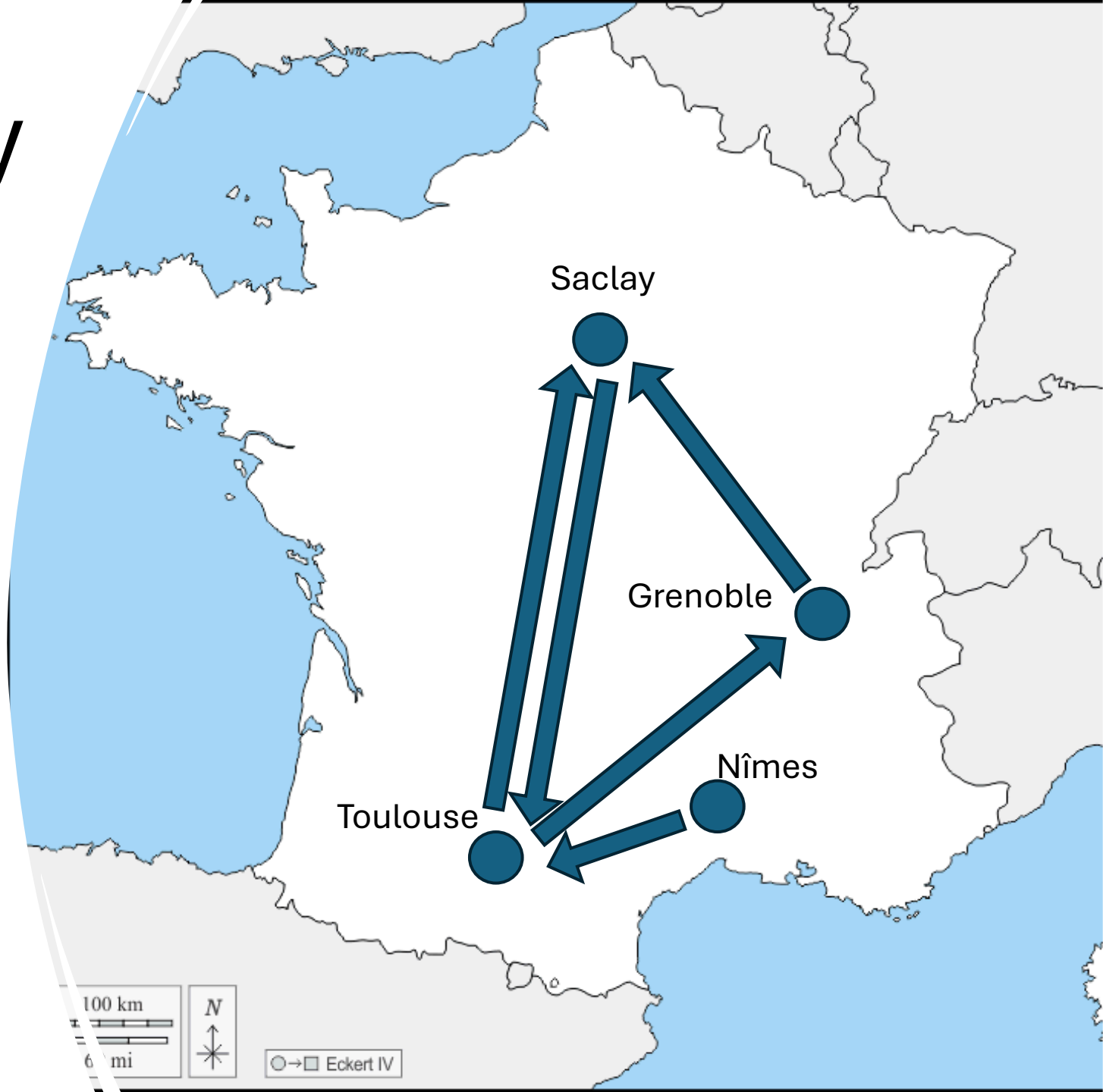
Computer Science, astrophysics

**2021-2023**
Supaero, Toulouse

Particle Physics, Cosmology

**2023-2024**
Particle Physics M2,Grenoble

**2024 - Now**
PhD with Benoît Blossier

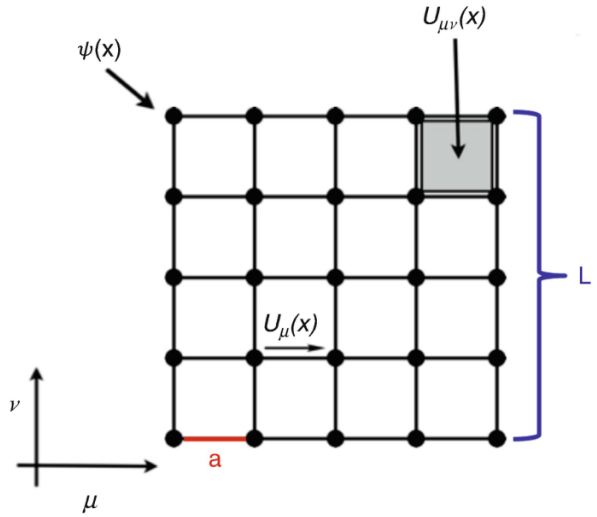


# Hobbies

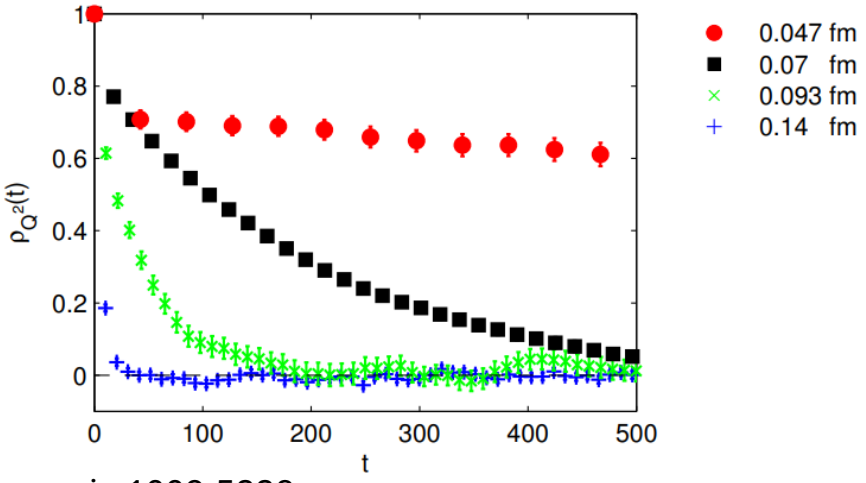
# Critical Slowing Down on the Lattice

**Lattice QCD**

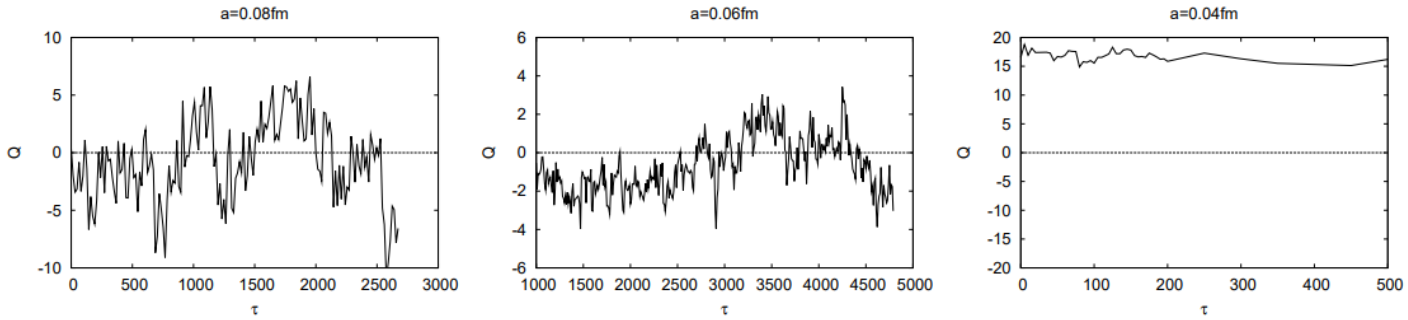
- A way to numerically compute non-perturbative observables
- Path Integral formulation + Monte Carlo techniques




**Problem :** a too small => increasingly difficult to explore all configurations !



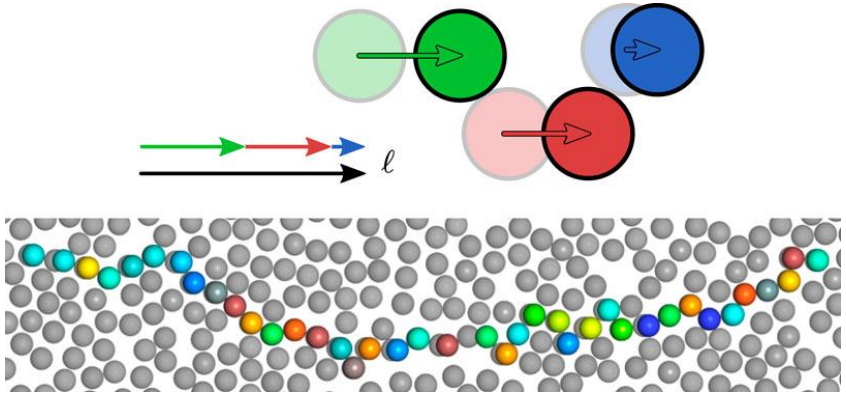

arxiv:1009.5228

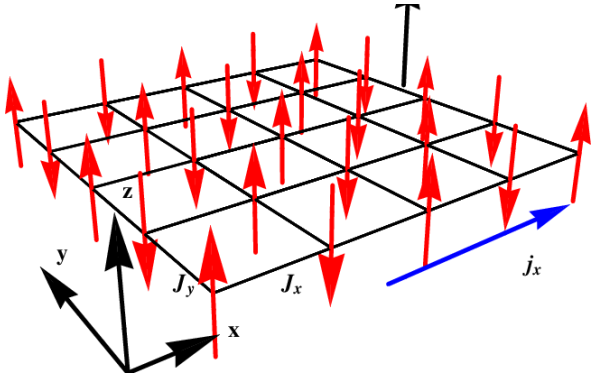



arxiv:0910.1465

# Event-Chain Monte Carlo

✓Reject-free
✓Irreversible
✓Continuous-time




Used in statistical physics for spin models/hard sphere models/chiral SU(3) model with good results (arXiv:1508.06541,arXiv:1505.07896, arXiv:1806.11460)

- **Possible in pure gauge LQCD ? In $CP^{N-1}$ models ?**
- **Physics application :** extract the running of $\alpha_s$ using the Taylor renormalization scheme on lattice simulations at very small lattice spacing

Thanks for your attention !