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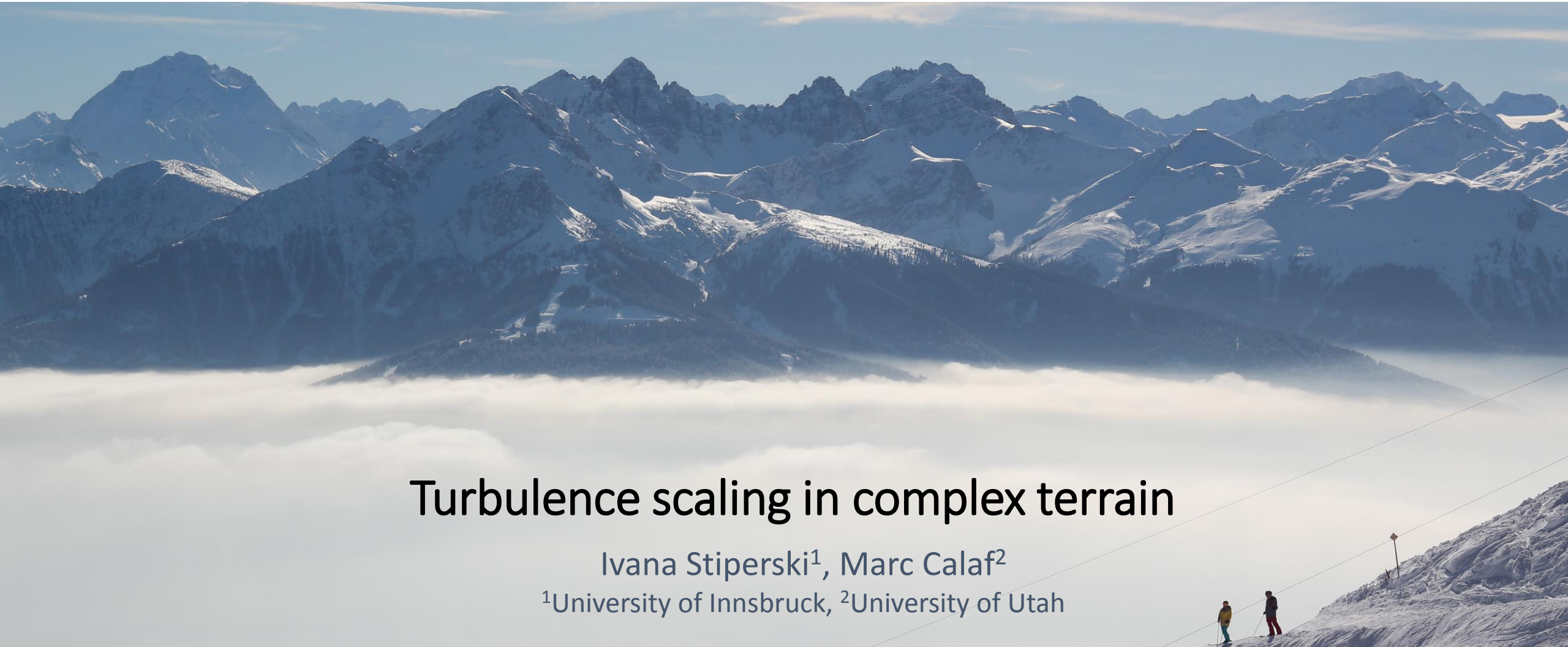

# Turbulence scaling in complex terrain

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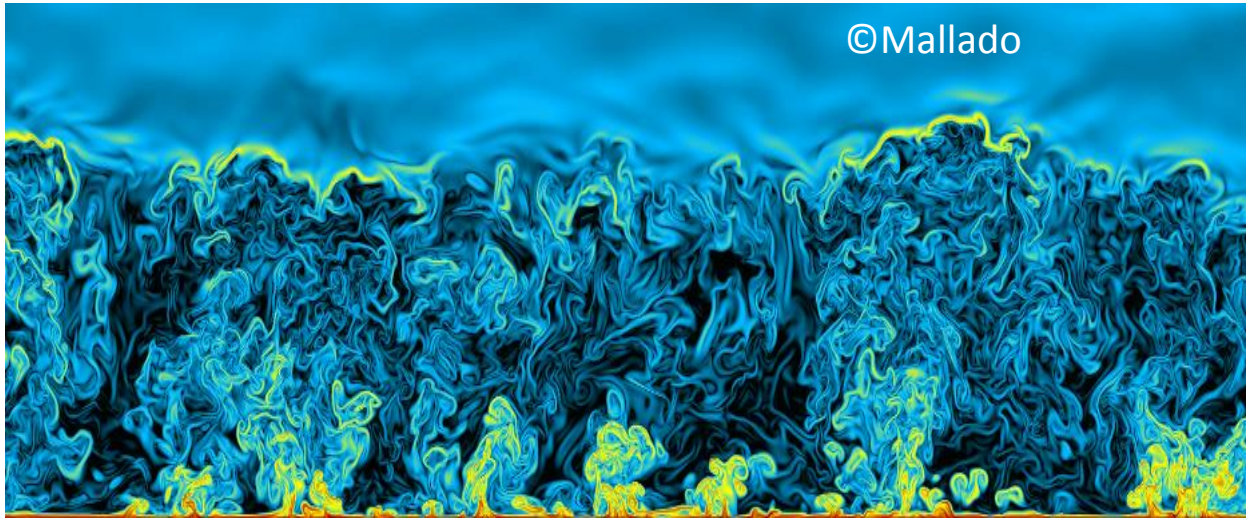
# Turbulence in land-atmosphere exchange

- Main mechanism of exchange of **energy, momentum and mass** between surface (e.g. biosphere, cryosphere) and atmosphere

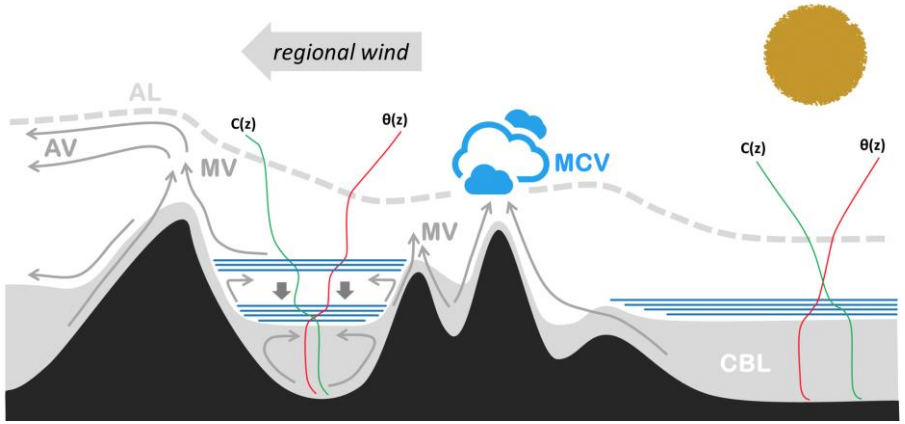
- Describe this exchange through **similarity theory**

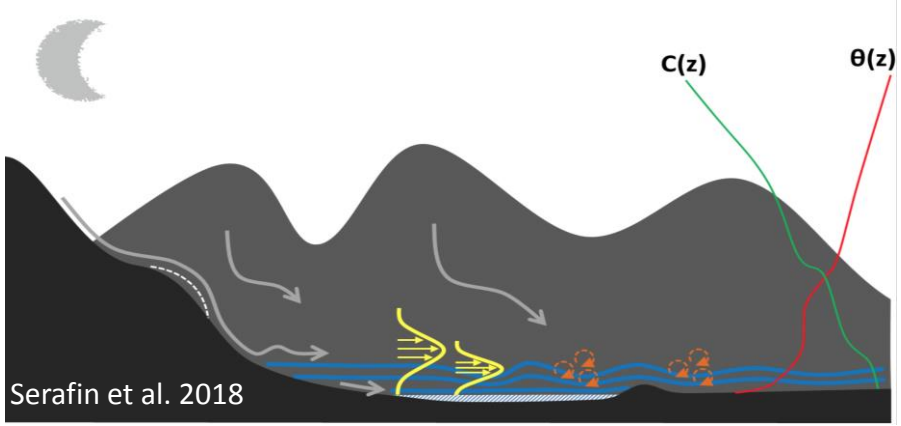
- Used for numerical weather prediction and climate projections, mass-balance modeling of glaciers …



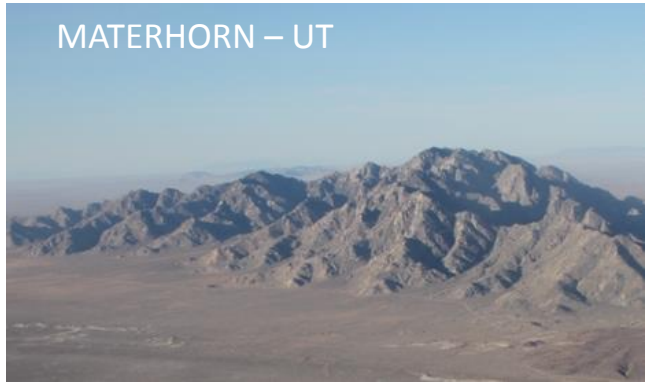
# Turbulence in mountains

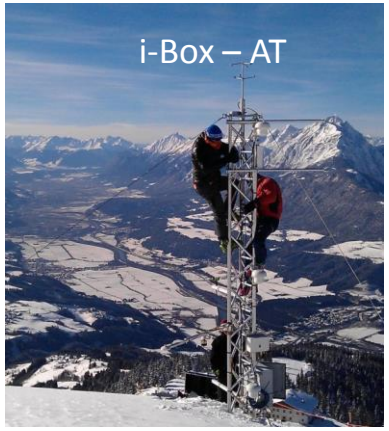
Heterogeneity (slope, orientation, land-use), non-stationarity, other relevant length scales …

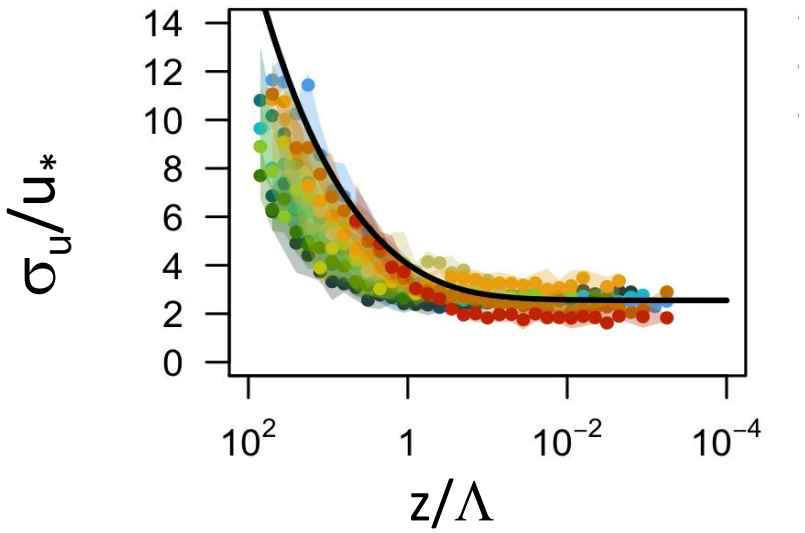


# Similarity scaling in mountains



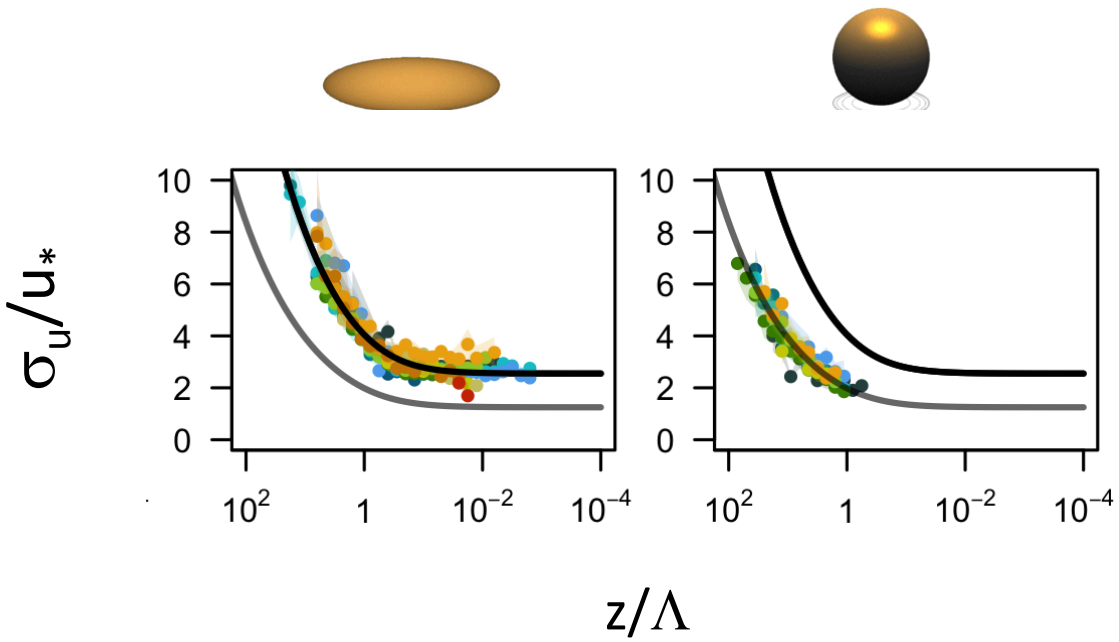






- Challenges to similarity theory
- We **lack** a common theory to describe turbulence

# My research

Developing a universal similarity scaling valid also over complex terrain




- **Anisotropy** - directionality of exchange of energy in turbulence
- Including information on anisotropy can improve turbulence scaling

- What is the effect of complex terrain on
  - turbulence?
  - anisotropy?
- Is turbulence in the mountains more efficient and why?

Need for more comprehensive measurements - TEAMx