

4TU.AMI



MATHEMATICS FOR INNOVATION

4TU.AMI Conference

“Mathematics on Deep Learning”

**Max Welling** - Institute of Informatics, University of Amsterdam

*Physics Inspired Deep Learning Methods*

Many people have been pondering why mathematics is so effective in describing physics. I will ask the question if the mathematical theories that describe physics are also effective in developing new machine learning methods. In particular I will discuss three cases:

- 1) Chaos and nonlinear dynamical systems
- 2) Differential geometry
- 3) Quantum mathematics

For all three cases I will give examples from my own research to show that these may indeed be a fruitful directions for further research.