



**Emergent  
Algorithmic  
Intelligence**



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**Room: On-line via ZOOM (Meeting ID: 83403274373 ; Passcode: 075162 )**

**Time: 11:00 – 12:00 pm**

### **Field Theoretical Methods for Bayesian Deep Learning**

The physics community has developed powerful approximation methods for the description of interacting many-particle systems. Many popular methods specialize the idea of a perturbation theory by taking into account various important properties of the physical system, such as its symmetries (Landau-Ginzburg theory) or long-range interactions (Higgs mechanism). It turns out that very similar concepts arise also in Bayesian deep learning, a branch of machine learning that has been heavily influenced by idea transfer from the physics community. In this talk, I will give an introduction to Bayesian deep learning. I will then show how perturbation theory, symmetries, and the Higgs mechanism can be exploited for better training and inference algorithms. These algorithms open up entirely new applications domains of machine learning research, such as a new generation of learned and highly effective codecs for data compression

**All interested are cordially welcome!**

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