



Monday, March 4th

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## The predictive brain: from algorithms to mechanisms

Workshops

🕒 09:30 – 18:30

📍 Sala XVI

### Description

Decades of neuroscience research support the long-standing idea of the predictive brain, postulating that the brain constantly predicts its future sensory input or the representation thereof. This idea has been gaining increasing attention in recent years and has inspired many studies in different sub-fields of neuroscience, ranging from experimental works on learning in the brain to computational psychiatry and brain-inspired machine learning. However, there has also been an increasing controversy in recent years on the mechanisms and computations involved in how the brain predicts its sensory inputs. In particular, there have been two main approaches to modeling the predictive processing in the brain: Top-down algorithmic models and detailed mechanistic models. The two approaches study the same set of behavioral phenomena but use distinct classes of models, with a broad variability in biological detail and functional flexibility. Accordingly, they provide different insights and make different experimental predictions. Our workshop brings computational neuroscientists from the two schools of thought together with their experimental colleagues, intending to increase interactions between the different sub-fields and discuss possible new research directions that could result from this inter

### Speakers

- [Alireza Modirshanechi](#), EPFL, PhD student
- [Katharina Wilmes](#), University of Bern

### Subsessions

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#### Introduction

March 04, 2024

🕒 09:30 – 09:45

#### Predictive visuomotor plasticity in mouse primary visual cortex

March 04, 2024

🕒 09:45 – 10:15

#### Predictive processing in uncertainty

March 04, 2024

🕒 10:15 – 10:45

#### Coffee break

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🕒 10:45 – 11:15

#### Movement, Prediction and Error in Mouse Auditory Cortex

March 04, 2024

🕒 11:15 – 11:45

#### Monte Carlo Predictive Coding: Learning probability distributions of sensory inputs with local synaptic plasticity

March 04, 2024

🕒 11:45 – 12:15

#### Uncertainty everywhere

March 04, 2024

🕒 15:30 – 16:00

#### The role of predictions in the neural circuit of perception

March 04, 2024

🕒 16:00 – 16:30

#### From predicting the world to predicting the body

March 04, 2024

🕒 16:30 – 17:00

#### Coffee break

March 04, 2024

🕒 17:00 – 17:30