

PHYSICAL COLLOQUIUM

INVITATION

Monday, 02.12.2019, 4.15 p.m., W2-1-148

speaks

Prof. Dr. Martin Weigt,

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about

**"Statistical physics of proteins:
From sequence data to predicting structure,
function, and designing new proteins"**

Proteins belong to the most fascinating complex systems in nature.

They are simultaneously robust and fragile: Proteins may conserve their 3D structure and function throughout evolution, in many cases even from bacteria to humans, while substituting more than 80% of their amino acids; however, very few random mutations may destabilize a protein or interrupt its function. Thanks to the sequencing revolution in biology, data-driven approaches modeling this sequence variability based on inspiration from inverse statistical physics are becoming increasingly popular. In my talk, I will review their astonishing capacity to extract information about 3D protein structure, about protein-protein interactions or about the effects of mutations from publicly available sequence data. In particular this last example leads to the concept of protein sequence landscapes (closely related to fitness landscapes), which have promising applications from interpreting evolutionary data to de-novo protein design.

All interested persons are cordially invited.

Sgd. Prof. Dr. Alexander Hartmann