

## 7 NOVEMBER 2025 11:00 AM

Bocconi University Room 301 (3rd floor) Via Sarfatti 25, Milano

## Geometric Barriers to Classical and Quantum Computing in Random Structures

## **Speaker**

David Gamarnik Professor of Operations Research MIT Sloan School of Management

## **Abstract**

I will discuss geometric barriers which arise in algorithmic questions of optimizing random Hamiltonians. These include the problems of finding a largest independent set in a random graph, random constraint satisfaction problems, spin glasses and perceptron models. The barriers which arise take the form of Overlap Gap Property (OGP) which I will define.

We will show how OGP becomes a barrier to large classes of algorithms exhibiting either input stability or which are online, appropriately defined. Time permitting, and if there is an interest I will discuss the case of random quantum Hamiltonians such as quantum spin glasses.

