ID de Contribution: **76** Type: **Non spécifié**

Theoretical physics and mathematical problems for climate, atmosphere and ocean dynamics

jeudi 27 mai 2021 14:00 (1h 30m)

A first part of these lectures will be devoted to a review of a set fundamental problems in climate, atmosphere and ocean dynamics and their connections to different fields of theoretical physics and mathematics: partial differential equations, probability, stochastic processes, statistics, machine learning, statistical physics, turbulence theory and topological effects in geophysical fluid dynamics. The aim will be to give an overview, necessarily limited and biased, of where and why mathematicians and physicists have an important role to play in these fields in the future.
A second part will present a few of my recent works related to climate and atmosphere dynamics. We will consider recent developments in theoretical physics for the study of rare events, and their applications for the study of extreme heat waves and abrupt climate change. We will also discuss the role of large deviation theory, in connection with kinetic theory, in order to improve our understanding of turbulent flows.

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