

Abstract

Oberwolfach Workshop:

Mathematics, Statistics, and Geometry of Extreme Events in High Dimensions

Dates:

18 - 23 August 2024 (Code: 2434)

Organizers:

Richard Davis, New York
Rafal Kulik, Ottawa
Anne Sabourin, Palaiseau
Stilian Stoev, Ann Arbor

Extreme events are, by definition, rare events that may have a significant impact when they occur. The mathematical theory that studies extreme events is known as extreme value theory, a branch of both probability and statistics. Originated in the first half of 20th century, extreme value theory is now capable of handling multivariate data, time series, spatial and functional phenomena. Mathematical models and results of extreme value theory apply to financial risk management, insurance, teletraffic and social networks, weather and climate modelling, to name a few areas. These and other applications lead, in turn, to the development of new complex models; these models have to account for percolation of extremes in time and space, and thus represent their dependence. This requires a deep theoretical understanding of the dependence structure of the multivariate and stochastic process models of extremes.

The aim of this workshop is to bring together researchers contributing to various recent topics, including: extremal dependence and causality; extremal clustering of time series; high-dimensional statistics and statistical learning; concentration of extremes and light-tailed models; extremes of complex systems.

The participants will discuss new directions and open mathematical problems. The leading experts will expose young researchers, postdocs and graduate students to the state-of-the-art in the field.