Speaker: Matthew Pawley (University of Bath)

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Title: Multivariate extreme value statistics for analysing simulated environmental extremes

Abstract:
Multivariate extreme value theory provides a statistical framework for the estimation of the probabilities associated with rare events occurring jointly across multiple variables. It finds applications in various fields, notably environmental science and finance. A critical, but often challenging, aspect of the modelling is capturing the dependence between variables in the tails of their distribution.
This talk describes my submission to the EVA 2023 Data Challenge, which tasked entrants with predicting multivariate extreme events involving an environmental variable in a fantasy country of Utopia. We combine clustering, sparse simplex projections, bivariate tail dependence summary measures, and a simple parametric model to estimate joint tail event probabilities involving trivariate and 50 dimensional random vectors. The methods are validated against the predictands' true values (released after the competition concluded).