

School of Physics and Astronomy

COLLOQUIUM

High-dimensional data visualisation for physics applications



Dr Ursula Laa
Monash University

In physics we often encounter high-dimensional data, in the form of multivariate measurements or of models with multiple free parameters. The information encoded is increasingly explored using machine learning, but is not typically explored visually. The barrier tends to be visualising beyond 3D, but systematic approaches for this exist in the statistics literature.

After briefly reviewing some of these methods I will focus on the grand tour, which visualises high-dimensional distributions as animations of smoothly interpolated projections, allowing the viewer to extrapolate the shape of the parameter space in high dimensions.

I will use examples from particle and astrophysics to show how we can use the tour for the visualisation of multidimensional posterior distributions or to explore grouping in high dimension. I will then discuss the idea of projection pursuit, i.e. searching the high-dimensional space for “interesting” low dimensional projections, and illustrate how we can detect complex associations between multiple parameters.

Date: Wednesday 17 April
Time: 2pm
Venue: L1, Large Seminar Room 107
10 College Walk, Clayton

Info: meera.parish@monash.edu