David Arrowsmith, School of Mathematical Sciences, Queen Mary University of London

Infrastructure networks - data, statics and dynamics

The talk will centre on a discussion of primary energy networks arising from actual data sets of various kinds of infrastructure.

We will consider the issues surrounding the extraction of network data, and in particular the problems of assembling accurate "overlaid networks".

We will cover several problems in the mathematical investigations carried out for both static and dynamic networks:

. the static network problem of examining backbone structures of the trans-European gas pipeline structures, and tolerance to failures. Ideas of max-flow and generalized betweenness centrality are involved in this problem.

. progress on the problem of examining cascade breakdown of electric power networks arising from transmission under-capacity on a dynamic grid.

. studies related to how we can address the problem of community impact of network breakdown

Discussion of future UK mathematics research issues in this area.