ANTHONY NIXON, Fields Institute, Toronto
Frameworks with Mixed Dimensional Constraints

In this talk I will introduce the idea of bar-joint frameworks in 3-dimensions where the joints are partitioned into two sets, one supported on a fixed 2-dimensional surface and the other on a fixed 1-dimensional surface. I will describe how the basics of rigidity theory adapt to these settings; in particular, relevant classes of graphs are shown to be 2-coloured graphs with various sparsity counts for the whole graph and for each monochromatic subgraph. I will focus on two particular examples of this idea: a line at a 45 degree angle to a plane and a line through the (translational) axis of a cylinder. I will discuss progress towards, and barriers to, finding combinatorial characterisations, or Laman-type theorems, for when such frameworks are rigid.