**Dr Diane GUIGNARD - Texas A&M University**

**Linear and nonlinear methods for model reduction**

We consider model reduction methods for the approximation of multivariate analytic functions in the case where the functions depend on infinitely many variables but present a certain anisotropy. The usual approach to model reduction is to construct a linear space V\_n of low-dimension n and define the approximation as some projection onto V\_n . In such cases, the construction of one suitable linear space V\_n is not feasible numerically. It is well-known that nonlinear methods, such as adaptive or best n-term approximations, provide improved efficiency. The idea of then to replace V\_n by a collection of linear spaces (aka a library) of dimension m<n.

In this talk, we first introduce various anisotropic model classes based on Taylor expansions and study their approximation by finite dimensional polynomial spaces described by lower sets of cardinality n. Then, in the framework of parametric PDEs, we present a possible strategy that can be used to build a library and provide an analysis of its performance.