We present recent work on the extension of classical a posteriori error estimates for Galerkin numerical solutions of parabolic problems by allowing the discrete spaces between time-steps to be completely unrelated from one another. As such, they can be used in conjunction with very general mesh modification for the first time. The practical interest of this setting is demonstrated by applying our results to finite element methods on moving meshes and using the estimators to drive an adaptive algorithm based on a virtual element method (VEM) on very general polygonal meshes.

This is joint work with O. Sutton (Leicester) and E. H. Georgoulis (Leicester and NTUA).