1171-13-124   **Benjamin Briggs*** (`briggs@math.utah.edu`), **Eloísa Grifo**, **Srikanth Iyengar**, **Janina Letz**,
Daniel McCormick and **Josh Pollitz**. *Cohomological support theory in commutative algebra.* Preliminary report.

Inspired by Quillen's use of cohomology to study the representation theory of finite groups geometrically, Avramov and Buchweitz established some remarkable facts about modules over local complete intersections through cohomological support varieties. Jorgensen extended these varieties to arbitrary local rings, and Pollitz later recast this theory and used it to characterise complete intersections purely in terms the structure of their derived categories. The utility and scope of cohomological support varieties has continued to grow since.

In joint work with Iyengar, Letz and Pollitz we prove a relative version of Pollitz' theorem above; characterising complete intersection homomorphisms in terms of the induced functor on derived categories. In joint work with Grifo and Pollitz we study how well all of this can be seen in module categories alone, rather than derived categories. And in joint work with McCormick and Pollitz we enrich the support varieties to a sequence of cohomological jump loci, which can detect much finer homological information in the representation theory of local rings (in particular, the Betti-degree of a module). I will (try to) survey all of these developments in my talk. (Received August 09, 2021)