JEFFREY CARLSON, University of Toronto
Local integration in equivariant cobordism theory

It has long been known that the equivariant complex T-cobordism class $[M]$ of an stably complex manifold M equipped with the action of a torus T is uniquely determined by the equivariant normal bundle $\nu(M^T)$ to its fixed point set, and tom Dieck and Lü–Wang respectively showed $[M]$ is also determined by its equivariant-K-theoretic and Borel-cohomological Chern numbers.

Each of these results constructs an injection of the bordism ring $\Omega_*^{U,T}$ into local data, but none identifies the image. Not all local data is possible, by the Atiyah–Bott/Berline–Vergne ("ABBV") localization theorem, which expresses equivariant characteristic numbers in terms of tangent and normal data on M^T, thus imposing identities involving mixed Chern numbers and tangent and normal representation data. It is natural to wonder whether these ABBV identities cut out the image of $\Omega_*^{U,T}$ or there are further constraints.

For isolated fixed points, normal data essentially comprises a list of T-representations. In the case of GKM torus actions and semifree circle actions, we show, in some cases via concrete construction, that there are no other constraints: every list of representation data consistent with the ABBV identities in fact occurs.

This work builds on that of Alastair Darby in the GKM case and is joint with Adina Elisheva Gamse and Yael Karshon.