Interacting conformal field theories are notoriously difficult to study in dimensions greater than four. In this talk, I will discuss some recent work, in which we explicitly derive novel ways to extract interesting data of five-dimensional superconformal field theories from supersymmetric localization using conformal perturbation theory, thereby discovering a new superconformal anomaly. I will then outline how some of these general results can be applied to the conformal bootstrap in five dimensions and statements in holography.