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## **Recent Progress in the Theory of Residual Intersections**

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we answer (prove) several long-standing questions (conjectures) about the structure of the residual intersections. Among others we prove the unmixedness of residual intersections, determine the structure of the associated primes and the canonical modules of (arithmetic) residual intersections. These facts were known to hold for ideals (closed subschemes) with locally few number of generators and were conjectured by Huneke-Ulrich in 1988 and Ulrich 1990 for any Strongly Cohen-Macaulay ideals in a Cohen-Macaulay local ring. Furthermore, in quite general setting we present a linear sharp upper bound for the Castelnuovo-Mumford regularity of residual intersections and some related symmetric powers. It is also clarified why the Hilbert function of an ideal may only depend on the degree of the generating sets and not the generators if we are in the situation of residual intersections.