Integrality, reductions and core of ideals.

C. Polini
University of Notre Dame
Notre Dame, Indiana 46556

Let I be an ideal in a commutative ring. Among the closure operations on I, the integral closure plays a central role. A reduction of I is a subideal with the same integral closure as I. One can think of reductions as simplifications of the ideal, which carry most of the information about I itself but, in general, with fewer generators. Minimal reductions, reductions minimal with respect to inclusion, are the counterpart of the integral closure. However, unlike the integral closure, minimal reductions are not unique. For this reason one considers their intersection, called the core of I. The core is related to adjoint and multiplier ideals, and to Briancon-Skoda type theorems. Furthermore a better understanding of the core could lead to a solution of Kawamata's conjecture on the non-vanishing of sections of certain line bundles. In this talk we will discuss the importance of the core, its ubiquity in algebra and geometry, and some effective formulas for its computation.