1052-13-23 **Wolmer Vasconcelos*** (vasconce@math.rutgers.edu), Department of Mathematics - Hill Center, Rutgers University, 110 Frelinghuysen Rd, Piscataway, NJ 08854. *What is – and what is not – a Cohen-Macaulay ring.*

Let $\mathbf{F}$ be a field and $\mathbf{f} = \{f_1, \ldots, f_m\}$ a set of polynomials of $\mathbf{F}[x_1, \ldots, x_d]$. For a diversity of reasons–algebraic, geometric and/or computational–it is of interest to understand the zero set $V(\mathbf{f})$ (in $\mathbf{F}$ or in one of its extensions). A common pathway to this goal is the examination of the ring $\mathbf{A} = \mathbf{F}[x_1, \ldots, x_d]/(\mathbf{f})$.

There are many structures attached to $\mathbf{A}$–Jacobian ideals, modules of differentials, chain complexes, local cohomology modules, dualities, among others. Their usefulness are greatly enhanced in the presence of the condition known as the Cohen-Macaulayness of $\mathbf{A}$. We will discuss this condition, its major examples, and the role it has played in the development of commutative and homological algebra.

Finally, we will discuss methods, some of recent vintage, to quickly ascertain whether some of these rings are Cohen-Macaulay or not.

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