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Information Accessibility and Cryptic Processes JOHN MAHONEY, CHRIS ELLISON, JAMES CRUTCHFIELD, Physics Department, University of California, Davis — We give a systematic expansion of the *crypticity*–a recently introduced measure of the inaccessibility of a stationary process's internal state information. This leads to a hierarchy of *k-cryptic* processes and allows us to identify finite-state processes that have infinite cryptic order–the internal state information is present across arbitrarily long, observed sequences. The crypticity expansion is exact in both the finite- and infinite-order cases. It turns out that k-crypticity is complementary to the Markovian finite-order property that describes state information in processes. One application of these results is an efficient expansion of the *excess entropy*–the mutual information between a process's infinite past and infinite future–that is finite and exact for finite-order cryptic processes.

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