

- ▶ AMIRHOSSEIN AKBAR TABATABAI, *Mining the Surface: Witnessing the Low Complexity Theorems of Arithmetic*.

Bernoulli Institute, University of Groningen, Nijenborgh 9, Groningen The Netherlands.

E-mail: amir.akbar@gmail.com.

One of the elegant achievements in the history of proof theory is the characterization of the provably total recursive functions of a theory by its proof-theoretic ordinal as a measure for the time complexity of the functions. Unfortunately, this characterization is not sufficiently fine-grained to capture the subclass of the functions with a feasible (polynomial time) definition. In this talk, we fill this gap. We show that if α is the proof-theoretic ordinal of the theory T and it has a polynomial time representation, then a feasibly-defined function is provably total in T iff it is computable by a sequence of PV-provable polynomial time modifications on a PV-provable initial polynomial time value, where the computational steps are indexed by the ordinals below α , decreasing by the modifications.