▶ DAVID GONZALEZ, *The ω-Vaught's conjecture.*
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Robert Vaught conjectured that the number of countable models of any given list of axioms must be either countable or continuum, but never in between. Despite all the work that has gone into this conjecture over the past sixty years, it remains open. It is one of the most well-known, long-standing open questions in mathematical logic. We introduce the ω-Vaught's conjecture, a strengthening of Vaught's conjecture for infinitary logic. We believe that a structural proof of Vaught's conjecture for infinitary logic would actually be a proof of the ω-Vaught's conjecture. Furthermore, a counterexample to the ω-Vaught's conjecture would likely contain ideas helpful in constructing a counterexample to Vaught's conjecture.

We prove the ω-Vaught's conjecture for linear orderings, a strengthening of Vaught's conjecture for linear orderings originally proved by Steel [Ste78]. The proof notably differs from Steel's proof (and any other previously known proof of Vaught's conjecture for linear orderings) in that it makes no appeal to lemmas from higher computability theory or descriptive set theory.

This talk is based on joint work with Antonio Montalbán.

[Ste78]John R. Steel. On Vaught's conjecture. In *Cabal Seminar 76–77 (Proc. Caltech-UCLA Logic Sem., 1976–77)*, volume 689 of *Lecture Notes in Math.*, pages 193–208. Springer, Berlin, 1978.