▸ RAUL FIGUEROA-SIERRA, *The optimal projective complexity of a counterexample to the Category Dichotomy.*
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The Category Dichotomy is a fundamental structural result for Borel ideals on ω [3]. The first ZFC counterexample was constructed in [1] via the ideal of nowhere dense subsets of a certain Fréchet space, building on a construction of Dow [2]. However, this work left open whether a counterexample could exist at a low level of the projective hierarchy, such as analytic or co-analytic.

This talk studies this *projective complexity*. We first observe a recent result of O. Guzmán and J. Navarro that the dichotomy holds for analytic ideals. Next, we prove it also holds for the co-analytic class. Our main result establishes the optimality of this boundary: in the constructible universe L, there exists a $\mathbf{\Delta^1_2}$ ideal constituting a counterexample, thus determining precisely the exact projective level at which the dichotomy can consistently fail.

This is joint work with Osvaldo Guzmán, Michael Hrušák, and Adam Kwela.

[1] A. Dow, R. Figueroa-Sierra, O. Guzmán, and M. Hrušák, *The category dichotomy for ideals*, ***Annals of Pure and Applied Logic***, vol. 177 (2026), no. 5, pp. 103717.

[2] A. Dow, *π-weight and the Fréchet-Urysohn property*, ***Topology and its Applications***, vol. 174 (2014), pp. 56–61.

[3] Michael Hrušák, *Katětov order on Borel ideals*, ***Archive for Mathematical Logic***, vol. 56 (2017), no. 7, pp. 831–847.