

## Logic Seminar

### *Factorising in the simplest integer part of surreal numbers*

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**Abstract:** Surreal numbers are a common generalisation of real and ordinal numbers, where one replaces Dedekind completeness of the reals with saturation, and the well-order of ordinals with a well-founded binary tree-like partial order called "simplicity relation". Using simplicity, one can define canonical, "simplest" operations of sum and product that generalise (Hessenberg) sum and product of real and ordinals, as well as simplest restricted analytic functions, global exponentiation, and H-field derivations with real kernel. I will present compact definitions for most of those based on simplicity, bypassing the traditional recursive definitions of Conway.

While the above functions turn out to be nonstandard models of the corresponding ones on the reals (and on LE-series for derivation with  $\exp$ ), the simplest *integer* part, the ring of the so-called omnific integers, presents other challenges. The (positive part of the) structure is a model of open induction but is otherwise far from being a nonstandard model of the integers. Conway conjectured that omnific integers satisfy at least a suitable weakening of unique factorisation. This is still unsolved: I will discuss the few known results, many deriving from work of Berarducci, and the latest joint work with L'Innocente, that can be obtained via certain valuations.

Tuesday, November 10 at 2:00 PM in Zoom
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