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Armin Straub* (astraub@illinois.edu), 1409 W. Green St., Mathematics Department, University of Illinois at Urbana-Champaign, Urbana, IL 61801. *Multivariate Apéry numbers and supercongruences of rational functions.*

The Apéry numbers $A(n)$ are the famous sequence which underlies Apéry's proof of the irrationality of $\zeta(3)$. Together with their siblings, known as Apéry-like, they enjoy remarkable properties, including connections with modular forms, and have appeared in various contexts. One of their (still partially conjectural) properties is that these sequences satisfy supercongruences, a term coined by Beukers to indicate that the congruences are modulo exceptionally high powers of primes. For instance,

$$A(p^r m) \equiv A(p^{r-1} m) \pmod{p^{3r}}$$

for primes $p \geq 5$. In this talk, we realize the Apéry numbers as the diagonal coefficients of a simple rational function in four variables and demonstrate that supercongruences hold for all Taylor coefficients of this rational function. We then indicate that this fresh perspective on supercongruences extends to other Apéry-like numbers. (Received February 04, 2014)