# Michigan Math Club

## Thursday at 4pm in the Nesbitt Room
## Free Pizza and Pop

# Hackenbush and Surreal Numbers

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The game of Blue-Red Hackenbush is simple to play, but answering the question "how much am I winning by?" turns out to be complicated. We will delve into the game to see that it is possible to be ahead by any integer number of moves, and then any rational number of moves. When we try to find a game that puts us ahead by any real number of moves, we will overshoot a bit and accidentally invent the *surreal numbers*, which include numbers like $\omega$ (larger than any real number), $\omega + 1$ (one more than that), and $\omega - 1$ (just a bit less than infinity). Oh, and don't forget $1/\omega$ (which is infinitesimally small). While we are here, we might as well build a game where we are winning by exactly $\omega - \pi$ moves. This talk is accessible to anyone willing to play some games, work hard to understand them, and think about infinity.