

1154-A0-81 **aBa Mbirika***, University of Wisconsin-Eau Claire, 105 Garfield Ave, Eau Claire, WI 54701. *Two research projects birthed from curiosity, recreation, and joy.*

This talk will center around two undergraduate research projects that were born from two specific recreational math topics. These topics brought me joy and then suddenly turned into full-blown research. The first topic emerged from a connection between the Fibonacci sequence modulo 10 and astrology. Oh No! Does the speaker believe in astrology!? Don't worry, this topic will be strictly number theory with, of course, a foundation that gives its connection to astrology (in particular, the zodiac). The second topic arose from noticing the magical and mystic golden ratio appearing as an eigenvalue of a certain tridiagonal real symmetric matrix. Generalizing this matrix to ever-increasing sizes, a wondrous joy is born from the corresponding sequence of characteristic polynomials that emerge. And lo and behold the diagonal entries in Pascal's triangle appear as the coefficients of these polynomials in an attractively inviting manner. Though the first project is one of number theory, and the second is one of combinatorial linear algebra, a cute connection between the two topics will be revealed at the end of the talk. (Received July 31, 2019)