1145-05-612 **Nicholas A. Loehr***, 225 Stanger Street, 460 McBryde Hall, Blacksburg, VA 24060, and **T. S. Michael**. *The combinatorics of evenly spaced binomial coefficients.* Preliminary report.

A curious identity for binomial coefficients states that $\sum_k \binom{n}{km} = \frac{1}{m}\sum_{j=0}^{m-1}(1+e^{2\pi ij/m})^n$. There are similar formulas for the sum of $\binom{n}{a}$ over all $a$'s with a given remainder mod $m$. This talk undertakes a combinatorial exploration of these formulas emphasizing bijective proofs. Our goal is to find a combinatorial explanation of why these sums are "almost" $2^n/m$. We give a bijective proof that the minimum of the sums $\sum_k \binom{n}{km+r}$ equals $(2^n - \ell(n,m))/m$, where the "error term" $\ell(n,m)$ has an explicit combinatorial interpretation involving words satisfying certain parenthesis-matching conditions. Among other consequences, this leads to a novel combinatorial model for alternate Lucas numbers. (Received September 11, 2018)