On an interesting property of 2671546041964800

Florian Luca

Let $f(n)$ be the function which associates to n the number of ordered factorizations of n in prime parts. If

$$n = p_1^{r_1} \cdots p_k^{r_k}$$

then

$$f(n) = \binom{r_1 + \cdots + r_k}{r_1, r_2, \ldots, r_k}.$$

Call n to be *prime-perfect* if $f(n) = n$. For example, the number given in the title whose factorization is

$$2^8 \times 3^6 \times 5^2 \times 7^2 \times 11^2 \times 13 \times 17 \times 19 \times 23$$

is prime-perfect. We have four more examples of prime-perfect numbers. In my talk, I will show that there are only finitely many n with such property and in fact the largest one satisfies $n < 10^{10^{100}}$.

This is joint work with Arnold Knopfmacher from Wits University in Johannesburg, South Africa.