1106-VX-777 **Wing Hong Tony Wong*** (wong@kutztown.edu), Department of Mathematics, Kutztown University of Pennsylvania, 15200 Kutztown Road, Kutztown, PA 19530, and **Sin Tsun Edward Fan**. *Constructing matroids with fixed parameters.*

There are three basic parameters for matroids, namely the size (denoted by n), the rank (denoted by r), and the number of bases (denoted by b). If we specifies n, r, and b such that $0 < r \leq n$ and $1 \leq b \leq \binom{n}{r}$, does there exist such a matroid satisfying all three parameters?

Dominic Welsh asked this question during the first Conference on Combinatorial Mathematics and its Application in University of Oxford in 1969, and this question has been wide open since then. In 2008, Mayhew and Royle proved that there is no matroid with size 6, rank 3, and 11 bases, but they conjectured that such a matroid always exists for any other set of parameters (n, r, b).

In our paper, we back up this conjecture with a proof that such a matroid always exists if r is big relative to $n - r$. We also prove that such a matroid exists for $r = 2$ and $r = 3$, except $(n, r, b) = (6, 3, 11)$. (Received September 06, 2014)