1086-11-748 **Geremias Polanco E.***, 401 W. Chesnut St, Bloomington, IL 61701, and **Daniel Schultz** and **Alexandru Zaharescu**. *Continuous Distribution Arising from the Three Gap Theorem.*

The well known Three Gap Theorem states that for $\alpha$ irrational, there are at most three gap sizes in the sequence of fractional parts $\{\alpha n\}_{n<N}$. The main discovery in this talk is that if we average over a short interval $[\beta, \beta + \eta]$, the distribution becomes continuous. Moreover, this continuous distribution is universal in the sense that it is the same for any $\alpha$ and any interval around $\beta$. Under these circumstances one would expect that the above averaging process would introduce enough randomness in the sequence so that the limiting distribution would be Possonian. We will prove that, supprisingly, this is not the case. (Received September 12, 2012)