

---

**WILLIAM CHAN**, Carnegie Mellon University  
*Definable Combinatorics of the First Uncountable Cardinal*

Under the axiom of determinacy, the first uncountable cardinal  $\omega_1$  has the strong partition property which implies that for each  $\epsilon \leq \omega_1$ , the  $\epsilon$ -length partition filter,  $\mu_\epsilon$ , is a countably complete ultrafilter. For  $1 \leq n < \omega$ ,  $\omega_{n+1}$  is the ultrapower of  $\omega_1$  by  $\mu_n$  and these ultrapower representations are important for combinatorics below  $\omega_\omega$ . Goldberg asked what is the ordertype of the ultrapower of  $\omega_1$  by all the other partition measures  $\mu_\epsilon$  when  $\omega \leq \epsilon \leq \omega_1$ . This talk will discuss progress on this question and other applications to combinatorics of determinacy. This will include club uniformization principles, continuity properties of functions on sequence of countable ordinals, and cardinality computations under determinacy. This is joint work with Stephen Jackson and Nam Trang.