1145-46-1643 **Joseph A Ball*** (joball@math.vt.edu). *Reproducing kernel Hilbert spaces: the free noncommutative and Hilbert module settings.*

The classical result of Aronszajn gives the connection between positive kernels and reproducing kernel Hilbert spaces. Extension of this formalism to the case of operator-valued kernels and reproducing kernel Hilbert spaces consisting of vector-valued functions is well known. Recent work of Ball-Marx-Vinnikov (Journal of Functional Analysis 2016) introduced the notion of completely positive noncommutative kernel and its associated free noncommutative reproducing kernel Hilbert space whose elements consist of free noncommutative functions in the sense of Kaliuzhnyi-Verbovetskyi–Vinnikov (AMS Mathematical Surveys and Monographs 199, 2014). The talk will review this background and discuss the next layer of generalization originating the 2016 Virginia Tech dissertation of Gregory Marx, namely: the setting where Hilbert spaces are replaced by Hilbert C^*- modules or (for more complete results) Hilbert W^*-modules, thereby extending to the free noncommutative setting results of Kasparov, Murphy, and Szafraniec. (Received September 23, 2018)