1165-14-22 **Young-Hoon Kiem** and **Michail Savvas*** (msavvas@ucsd.edu). *Almost perfect obstruction theory and K-theoretic Donaldson-Thomas invariants.*

Perfect obstruction theories are a fundamental ingredient used to define invariants associated to moduli problems, such as virtual cycles in the Chow group and virtual structure sheaves in K-theory. However, several moduli spaces, such as the moduli space of simple perfect complexes and desingularizations of moduli stacks of semistable sheaves on Calabi-Yau threefolds, do not admit a perfect obstruction theory. In this talk, we introduce the relaxed notion of an almost perfect obstruction theory on a Deligne-Mumford stack and show that it gives rise to a virtual structure sheaf in its K-theory. This applies to many examples of interest, including the above, and enables us to define K-theoretic virtual invariants and, in particular, K-theoretic Donaldson-Thomas invariants of sheaves and complexes on Calabi-Yau threefolds. (Received January 04, 2021)