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Luke Juusola* (ljuusola@caltech.edu) and **Martino Lupini**. *The Borel Quantum Chromatic Number*. Preliminary report.

The idea of graph colorability has proven very useful in many aspects of combinatorics and has achieved broad impacts over many fields. This has led to the study of graph colorings in a large variety of contexts. Of these, we concern ourselves primarily with "quantum mathematics," where the notion can be defined in terms of a quantum graph coloring game. We add to this theory by considering two variants. First, we consider standard Borel graphs and study the quantum analogue of the Borel chromatic numbers. Then we do the same for measurable graphs and colorings, and finally, we consider connections among them, such as separation. (Received September 26, 2017)