1145-VP-1013 **Drake P Olejniczak*** (`drake.p.olejniczak@wmich.edu`). *An Application of Ramsey Numbers.*

The mathematician Theodore Motzkin said, describing Ramsey theory, that "complete disorder is impossible". While this should be taken with a grain of salt, Ramsey theory offers a glimpse at the relationship between order and chaos. In certain circumstances, it is found that in any sufficiently large structure, some prescribed sub-structure must exist. The most well known area of Ramsey theory is the study of Ramsey numbers. The Ramsey number of two graphs F and H, denoted $R(F, H)$, is defined to be the smallest positive integer n such that if every edge of the complete graph K_n is colored either red or blue then there exists a subgraph isomorphic to F all of whose edges are red or a subgraph isomorphic to H all of whose edges are blue. A version of Ramsey's theorem guarantees that such an n exists. Ramsey theory is not limited to graphs, and there are a number of exciting and useful applications of Ramsey theory to number theory, algebra, topology, and geometry. In this talk, we show how a version of Ramsey's theorem can be used to prove Schur's theorem, and, in turn, prove a result about the status of Fermat's last theorem in $\mathbb{Z}_p$. (Received September 18, 2018)