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**Stanisław Radziszowski\*** ([spr@cs.rit.edu](mailto:spr@cs.rit.edu)), Department of Computer Science, Rochester Institute of Technology, Rochester, NY 14623. *Computations in Ramsey Theory*.

Ramsey theory is often regarded as the study of how order emerges from randomness. While originated in mathematical logic, it has applications in geometry, number theory, game theory, information theory, approximation algorithms, and other areas of mathematics and theoretical computer science.

Ramsey theory studies the conditions of when a combinatorial object necessarily contains some smaller given objects. The central concept in Ramsey theory is that of arrowing, which in the case of graphs describes when colorings of larger graphs necessarily contain monochromatic copies of given smaller graphs. The role of Ramsey numbers is to quantify some of the general existential theorems in Ramsey theory, always involving arrowing. The determination of whether this arrowing holds is notoriously difficult, and thus it leads to numerous computational challenges concerning various types of Ramsey numbers.

This talk will overview how computers are increasingly used to study the bounds on Ramsey, and properties of Ramsey arrowing in general. This is happening in the area where traditional approaches typically call for classical computer-free proofs. It is evident that now we understand Ramsey theory much better than a few decades ago, increasingly due to computations. (Received September 09, 2017)