1110-05-351 **Michael Barrus**, **Michael Ferrara**, **Jennifer Vandenbussche** and **Paul S Wenger***
(pswsma@rit.edu). *The Rainbow Saturation Number of Graphs.*

In 1987, Hanson and Toft introduced the following question drawing from both saturation numbers and Ramsey numbers:

Let $H_1, \ldots, H_k$ be graphs. What is the minimum number of edges in an n-vertex graph G such that 1) G has a k-edge-coloring what does not contain a monochromatic copy of H_i in color i for any i, and 2) for every edge $e \in E(\overline{G})$, every k-edge-coloring of $G + e$ contains a monochromatic coloring of H_i in color i for some i?

A *rainbow edge coloring* of a graph H is an edge coloring such that each edge receives a distinct color. In this talk we introduce an anti-Ramsey variation of the Hanson-Toft question: For a graph H, what is the minimum number of edges in an n-vertex t-edge-colored graph G that does not contain a rainbow copy of H, but the addition of any edge in any color to G completes a rainbow copy of H. We call this number the *t-rainbow saturation number* of H, denoted $\mathrm{sat}_t(n, H)$.

We present a variety of results demonstrating some surprising behavior of rainbow saturation numbers. In particular, we will show that for $t \geq \binom{k}{2}$, the t-rainbow saturation number $\mathrm{sat}_t(n, K_k)$ lies between $\frac{n \log n}{\log \log n}$ and $n \log n$. (Received February 24, 2015)