

**Computer assisted discovery: Zero forcing vs vertex cover**

*Boris Brimkov, Slippery Rock University*

*Randy Davila, RelationAI*

*\*Houston Schuerger, Trinity College, Houston.Schuerger@trincoll.edu*

*Michael Young, Carnegie Mellon University*

In this talk, we showcase the process of using an automated conjecturing program called *TxGraffiti* written and maintained by the second author. We begin by discussing a new result originally conjectured by *TxGraffiti* that for a claw-free graph  $G$ , the vertex cover number  $\beta(G)$  is greater than or equal to the zero forcing number  $Z(G)$ . The approach to this result is constructive, and yields a polynomial time algorithm to find a zero forcing set with cardinality  $\beta(G)$ . Additionally, inspired by the aforementioned conjecture of *TxGraffiti*, we also discuss a more general relationship between the zero forcing number and the vertex cover number for any connected graph with maximum degree  $\Delta \geq 3$ , namely that  $Z(G) \leq (\Delta - 2)\beta(G) + 1$ .