1142-51-90 **Thomas D. Eddy*** (eddy@math.colostate.edu). *Upper Bounds for Stick Numbers of Knots Through Random Sampling of Confined Polygons.*

The stick number of a knot is the minimum number of straight edges needed to construct the knot. This invariant is unknown for most knots, although various theoretical and observed bounds are known. Previous research has attempted to improve the observed upper bounds for stick number by generating random polygons and identifying the knots they form. This talk will present a new variation on this method which generates equilateral polygons in tight confinement to increase the incidence of complex knots. Even in tight confinement, the formation of complex knots is rare and thus one must choose a generation algorithm which is capable of producing large numbers of samples rapidly. This talk will describe such an algorithm, which is based on the toric symplectic structure of equilateral polygon space, and how to use it to generate and identify the knot type of billions of polygons. The talk will conclude with new stick number upper bounds for more than 20 knots, including exact stick numbers for two knots, obtained using this method. (Received August 30, 2018)