Topology, Arithmetic, & Dynamics Seminar

An invitation to the Heisenberg group and its deformations

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The Heisenberg group is a 3-dimensional geometry that shares many properties with Euclidean space, but also has some strange quirks. For example, it is natural to constrain motion in the Heisenberg group to a 2-dimensional space of directions, which makes the Hausdorff dimension of the Heisenberg group 4 rather than 3. In the first half of the talk, I will discuss the general structure of the Heisenberg group and some motivation for studying it.

Then, I will focus on the question of deforming the Heisenberg group: how do we find geometric (smooth, BL, QC, QR) mappings from the Heisenberg group to itself and to other spaces? Very powerful theorems modeled on those in complex analysis constrain the mappings, but it remains a challenge to answer innocent-looking questions, and to build (or rule out) parallels of standard Euclidean examples. We will finish with a look at a recent result (joint with Faessler and Tyson) that provides new mappings and leverages subelliptic PDEs to provide new constraints.

Date: **Friday, September 22, 2017**
Time: **2:30-3:20 pm**
Place: **4106 Exploratory Hall**

For special accommodations, please contact Sean Lawton via email at `slawton3@gmu.edu`.