1135-11-2713 **Sarah Arpin** (sarah.arpin@colorado.edu), **Joel Ornstein** (joel.ornstein@colorado.edu) and **Michael Wheeler*** (michael.wheeler@colorado.edu). *Geometry of Lattices of Cyclotomic Number Rings Under the Minkowski Embedding.*

Cryptographers are pursuing the use of hard problems on lattices of rings of integers, such as Ring Learning With Errors, as an approach to post-quantum cryptography. Lattice based cryptosystems are one of the most promising avenues for post-quantum security. Our research looks into the geometry of the lattices formed by cyclotomic number rings, looking for structure that could potentially lead to vulnerability. Cyclotomic number rings are the most likely number rings to be used in cryptographic applications due to ease of computation and lack of known vulnerabilities. We look at the geometry of the lattice that arises from the Minkowski Embedding, for any n. Using number theory and Galois theory, we completely describe the inner products of pairs of basis vectors in this lattice. Research supervised by Katherine E. Stange, University of Colorado, Boulder. (Received September 26, 2017)