1117-52-155 **Tin-Yau Tam*** (tamtiny@auburn.edu), Department of Mathematics and Statistics, 221 Parker Hall, Auburn University, Auburn, AL 36830. *Hyperbolic geometry of positive definite matrices associated with geometric mean.*

In this talk we will discuss the geometry and inequalities associated with the geometric mean of positive definite matrices. The space P_n of $n \times n$ positive definite matrices of determinant 1 is a Riemannian manifold. It turns out that the geometry associated with the Riemannian structure is hyperbolic. We show that geodesic convexity emerges when a natural pre-order call log majorization is introduced to P_n. We also derive several inequalities for the geometric mean. Some inequalities reflect the hyperbolic geometry. (Received January 12, 2016)