1103-43-71 **Stephen D. Casey*** (scasey@american.edu), Math/Stat Department, American University, 4400 Massachusetts Avenue, N. W., Washington, DC 20016-8050. *Sampling and Geometry.* Preliminary report.

Sampling theory is a fundamental area of study in harmonic analysis and signal and image processing. Our talk will connect sampling theory with the geometry of the signal and its domain.

There are numerous motivations for extending sampling to non-Euclidean geometries. Applications of sampling in spherical and hyperbolic geometries are showing up areas from EIT to cosmology. Sampling in spherical geometry has been analyzed by many authors and brings up questions about tiling the sphere. Irregular sampling of band-limited functions by iteration in hyperbolic space has been developed. In Euclidean space, the minimal sampling rate for Paley-Wiener functions on $\mathbb{R}^d$, the Nyquist rate, is a function of the band-width. No such rate has yet been determined for hyperbolic or spherical spaces. We look to develop a structure for the tiling of frequency spaces in both Euclidean and non-Euclidean domains. In particular, we develop an approach to determine *Nyquist tiles* and *sampling groups* for spherical and hyperbolic space. We then connect this to arbitrary orientable analytic surfaces using Uniformization. (Received August 11, 2014)