Department of Mathematics, BGU

Colloquium

On *Tuesday, October ,26 2021*

At *14:30 – 15:30*

In *Math 101-*

Dmitry Fafiman (Tel Aviv University)

will talk about

Integral geometry and valuation theory in pseudo-Riemannian spaces

Abstract: We will discuss the Blaschke branch of integral geometry and its manfiestations in pseudo-Riemannian space forms. First we will recall the fundamental notion of intrinsic volumes, known as quermassintegrals in convex geometry. Those notions were extended later to Riemannian manfiolds by H. Weyl, who discovered a remarkable fact: given a manfiold M embedded in Euclidean space, the volume of the epsilon-tube around it is an invariant of the Riemannian metric on M. We then discuss Alesker's theory of smooth valuations, which provides a framework and a powerful toolset to study integral geometry, in particular in the presence of various symmetry groups. Finally, we will use those ideas to explain some recent results in the integral geometry of pseudo-Riemannian manfiolds, in particular a collection of principal Crofton formulas in all space forms, and a Chern-Gauss-Bonnet formula for metrics of varying signature. Partially based on joint works with S. Alesker, A. Bernig, G. Solanes.