Busemann-Mayer Type Theorems in Pseudo-Finsler Geometry

Marc Troyanov[1]

[1] EPFL, Lausanne, Switzerland

A Finsler structure on a smooth manifold M is characterized by a function $F : TM \to \mathbb{R}$ that defines a weak norm on each tangent space of the manifold. This function (known as the *Lagrangian* of the Finsler structure), provided it is sufficiently regular, allows us to assign a length to any Lipschitz path and thus define a distance d on the manifold.

In 1941, H. Busemann and W. Mayer explored the minimal regularity conditions under which the Lagrangian can be recovered from the distance function. This work was further refined by S. Kobayashi in 1991.

In this talk, I will introduce the notion of *Pseudo-Finsler manifolds* (also referred to as *Timelike Finsler manifolds* and present some foundational concepts of pseudo-Finsler geometry. I will also discuss versions of the Busemann-Mayer-Kobayashi type results adapted to the timelike setting.