

1033-37-3

Sergei Tabachnikov*, Pennsylvania State University. *Ubiquitous billiards.*

I shall start with motivation for the study of billiard-like systems coming from the classical mechanics: essentially, a free mechanical system with elastic collisions is a billiard system. I shall describe some non-conventional billiards: magnetic billiards, Finsler billiards, outer (or dual) billiards. I shall discuss selected recent results: a multi-dimensional version of the Birkhoff theorem on the number of periodic billiard trajectories; applications of ideas from sub-Riemannian geometry to inner and outer billiards; integrable billiards in pseudo-Euclidean spaces; periodic and escaping orbits in polygonal outer billiards. (Received September 13, 2006)