Metric Spaces, Convexity and Nonpositive Curvature (Second edition)

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Abstract: This is the second edition of a book which appeared in 2005. The new edition is an expanded and revised version. The book is about metric spaces of nonpositive curvature in the sense of Busemann, that is, metric spaces whose distance function is convex. We have also included a systematic introduction to the theory of geodesics and related matters in metric spaces, as well as a detailed presentation of a few facets of convexity theory that are useful in the study of nonpositive curvature. The exposition starts from first principles and we give full proofs. Examples and applications are spread throughout the book, and they come from hyperbolic geometry, from the theory of Teichmüller spaces and from Hilbert geometry. At the end of each chapter there are historical notes and other notes on further developments.

Keywords: Hilbert geometry, Convexity, metric space, metric geometry, nonpositive curvature, Busemann geometry, Alexandrov space, global methods, isometries, Busemann space, locally convex space, visual boundary, Busemann function, horosphere, Minkowski geometry, Menger convexity, Hausdorff metric, hyperbolic geometry, Teichmüller space, Hilbert geometry.

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Consultations de la notice
In mathematics, spaces of non-positive curvature occur in many contexts and form a generalization of hyperbolic geometry. In the category of Riemannian manifolds, one can consider the sectional curvature of the manifold and require that this curvature be everywhere less than or equal to zero. The notion of curvature extends to the category of geodesic metric spaces, where one can use comparison triangles to quantify the curvature of a space; in this context, non-positively curved spaces are known as Metric spaces, convexity and nonpositive curvature. Papadopoulos A.