

Analytic Hyperbolic Geometry
with Applications

Abraham Ungar
Department of Mathematics
Junior Colloquium, NDSU

3:00 pm, Thur. September 18, 2014
Minard 112

ABSTRACT

Analytic hyperbolic geometry in n dimensions is our target, whose underlying motive is to cultivate a new interdisciplinary region between the hyperbolic geometry of Lobachevsky and Bolyai and the special theory of relativity of Einstein. The new interdisciplinary region involves analysis, algebra and geometry. As such, it proves to be a rich playground for hyperbolic geometry and relativistic physics, resulting in the speaker's seven books listed below (six of which are available in the NDSU Library).

As a mathematical prerequisite for a fruitful following of the talk it is assumed familiarity with basic elements of linear algebra. In particular, there is no demand upon participants as to a prior acquaintance with either hyperbolic geometry or special relativity theory.

REFERENCES

- [1] A. A. Ungar, *Beyond the Einstein Addition Law and its Gyroscopic Thomas Precession: The Theory of Gyrogroups and Gyrovector Spaces*. Dordrecht: Kluwer Acad. Publ., 2001.
- [2] A. A. Ungar, *Analytic Hyperbolic Geometry: Mathematical Foundations and Applications*. Singapore: World Scientific, 2005.
- [3] A. A. Ungar, *Analytic Hyperbolic Geometry and Albert Einstein's Special Theory of Relativity*. World Scientific Publishing Co. Pte. Ltd., Hackensack, NJ, 2008.
- [4] Abraham A. Ungar. *A gyrovector space approach to hyperbolic geometry*. Morgan & Claypool Pub., San Rafael, California, 2009.
- [5] Abraham A. Ungar. *Hyperbolic triangle centers: The special relativistic approach*. Springer-Verlag, New York, 2010.
- [6] Abraham A. Ungar. *Barycentric calculus in Euclidean and hyperbolic geometry: A comparative introduction*. World Scientific Publishing Co. Pte. Ltd., Hackensack, NJ, 2010.
- [7] Abraham A. Ungar. *Analytic hyperbolic geometry in n dimensions: An introduction*. CRC Press, Boca Raton, FL, 2015.