1056-20-1766 **Michael Kinyon*** (Michael.Kinyon@du.edu), Department of Mathematics, 2360 S Gaylord St, University of Denver, Denver, CO 80208, and **Wolfgang Bertram** (bertram@iecn.u-nancy.fr), Institut Élie Cartan Nancy, Nancy-Université, Nancy, France. *Associative Geometry.*

Corresponding to any associative algebra, or more generally, to any associative pair, is a geometric object called an *associative geometry*. Conversely, to any associative geometry, there is a (functorially constructed) corresponding associative pair. The associative geometry of a unital associative algebra $\mathbb{A}$ is the Grassmannian of right $\mathbb{A}$-modules in $W = \mathbb{A} \oplus \mathbb{A}$ equipped with a certain (ternary) semigroup structure. This global semigroup structure specializes to the standard (ternary) abelian group structure on the set of all complements to a given submodule, and it also includes the (general linear) group of transformations of W. In fact, an associative geometry is a canonical semigroup completion of a general linear group and its homotopes, viewed as sitting inside an associative algebra. Taking involutions of associative algebras and associative geometries into account, we can construct canonical semigroup completions for all classical groups and their homotopes (and, in certain cases, for their analogs in infinite dimension or over general base fields or rings). (Received September 22, 2009)