Abstract Submitted
for the APR12 Meeting of
The American Physical Society

**Sommerfeld's balancing act with Einstein: The geometry of relativistic velocity space** FELIX T. SMITH, SRI International — Minkowski's (M's) first paper (1908) on relativistic 4-space mentions that it made contact with nonEuclidean geometry, but he died in early 1909 before he could pursue that idea. Sommerfeld (S) saw that one of the known examples of that geometry, the sphere of imaginary radius, was a natural model for relativistic velocity space, and in 1909 he presented in 3 pages an illuminating geometrical proof of Einstein's (E's) theorem on relativistic velocity addition. Very different was his 79-page systematic development in 1910 of the 4-space vector algebra that had been invented by M. In a crucial footnote in it S had side-stepped the nonEuclidean idea, while still being true to what he believed, saying: "It is possible, though hardly to be recommended, to translate all the following into corresponding nonEuclidean terminology." At a meeting in Salzburg in 1909 E and S had become friends. A 1910 letter of E's to S tells us that at Salzburg E must have let S know how strongly he disliked the 4-space view of relativity, but that he now really liked S's long paper. The importance of S's special geometric insights, and their relative neglect subsequently, will be discussed.

Felix T. Smith
SRI International

Date submitted: 06 Jan 2012 Electronic form version 1.4