Meeting: 1000, Albuquerque, New Mexico, SS 8A, Special Session on Interactions in Riemannian Geometry

1000-53-117 **Gary R. Jensen*** (gary@math.wustl.edu), Math Department, Campus Box 1146, Washington University, St. Louis, MO 63130, **Thomas E. Cecil**, Dept of Mathematics and Computer Science, Worcester, MA 01610-2395, and **Quo-Shin Chi**, Math Dept, Campus Box 1146, St. Louis, MO 63130. *Isoparametric hypersurfaces by Lie sphere geometry.* Preliminary report.

A conformal transformation of an isoparametric hypersurface in a sphere is not, in general, an isoparametric hypersurface. By a thoerem of T. Cecil's, however, the Legendre lift of an isoparametric hypersurface has a simple Lie geometric characterization. In the case of four distinct curvature spheres, Münzner showed that there can be at most two distinct multiplicities m_1, m_2, and Stolz showed that the pair (m_1, m_2) must either be $(2, 2)$, $(4, 5)$, or be equal to the multiplicities of an isoparametric hypersurface of FKM-type, constructed by Ferus, Karcher, and Münzner. The Legendre lift of an isoparametric hypersurface of FKM-type satisfies a necessary and sufficient condition in terms of the Lie sphere theoretic invariants. We prove that if $m_2 \geq 3m_1 - 1$, then the isoparametric hypersurface satisfies this condition, hence must be of FKM-type. (Received August 20, 2004)