1031-35-42 **C. Denson Hill*** (dhill@math.sunysb.edu), Dept. of Mathematics, Stony Brook University, Stony Brook, NY 11794. *Einstein equations and Local Embedding of 3-dim CR manifolds.*

Three dimensional smooth abstract CR manifolds are, with probability one, not locally embeddable as hypersurfaces in C^2. They may even be such that all local CR functions are constant. However, to each abstract 3-dim CR structure, there is a naturally associated class of Lorentzian metrics on a 4-dim spacetime. This class of metrics might, or might not, contain a metric satisfying the vacuum Einstein equations, with cosmological constant. We explore some deep and interesting connections between these two seemingly unrelated phenomena. This is joint work with P. Nurowski and J. Lewandowski. (Received July 26, 2007)