1016-53-42 **O. Michael Melko*** (mike.melko@northern.edu), Department of Mathematics, Northern State University, 1200 South Jay Street, Aberdeen, SD 57401. *Constructing Minimal Surfaces via Automorphic Functions.* Preliminary report.

Costa's surface is an interesting example of a minimal surface that has the topological type of a torus with three points removed. It can be realized by means of the Weierstrass representation, where the underlying Weierstrass data are the elliptic functions $\wp$ and $C/\wp'$. Here, $\wp$ denotes the Weierstrass $\wp$-function with the Gaussian integers as period lattice, and C is a suitable constant.

By definition, *elliptic functions* are meromorphic functions on the complex plane that are doubly-periodic with respect to some lattice, i.e., they are invariant under the action of a (commutative) discrete properly discontinuous group of translations. In the same vein, meromorphic functions on the Poincaré disk (U, ds) are said to be *automorphic* if they are invariant with respect to a discrete properly discontinuous group of isometries of (U, ds).

This suggests that one might find interesting new examples of higher genus minimal surfaces by using automorphic functions as Weierstrass data. In this talk, we discuss some methods for computing automorphic functions and explore the connection between them and the geometry of minimal surfaces afforded by the Weierstrass representation. (Received January 16, 2006)