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

1000-53-149 **David E. Blair*** (blair@math.msu.edu), Department of Mathematics, Michigan State University, East Lansing, MI 48824-1027, and **Alfonso Carriazo**, Universidad de Sevilla, Sevilla, Spain. *On Lagrangian Catenoids.* Preliminary report.

Two differential geometric ideas often interact to give an interesting geometric situation. E.g. there are many surfaces of revolution and many minimal surfaces in Euclidean 3-space, but only a catenoid is both.

In 1973 I showed that a conformally flat, minimal hypersurface of Euclidean space is either totally geodesic or a hypersurface of revolution with a specific profile curve; these are called generalized catenoids.

Recently I. Castro and F. Urbano introduced the Lagrangian catenoid. Topologically it is $\mathbb{R} \times S^{n-1}$; its induced metric, $ds^2 = \cosh^{2/n}(nu)(du^2 + g_0)$, is conformally flat. Their result is that if a Lagrangian, minimal submanifold of $\mathbb{C}^n$ is foliated round $(n-1)$-spheres, it is congruent to a Lagrangian catenoid. We ask if, aside from the totally geodesic case, the Lagrangian catenoids are the only conformally flat, minimal, Lagrangian submanifolds in $\mathbb{C}^n$. The problem is formidalbe but as the Schouten tensor of the Lagrangian catenoid has only two eigenvalues we restrict to this case and prove for a conformally flat, minimal, Lagrangian submanifold of $\mathbb{C}^n$, if the Schouten tensor has at most two eigenvalues, then either M^n is totally geodesic or a Lagrangian catenoid. (Received August 23, 2004)