



DPTO. GEOMETRÍA Y TOPOLOGÍA

Seminario de Geometría Diferencial y Topología

Conferencias impartidas por el
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Título: A Complex Geodesic Flow.

Fecha: Lunes, 24 de marzo de 2008.

Hora: 12:00 h.

Resumen:

When one poses a question like, what is the complex analogue of the geodesic flow, many objections may arise in one's mind, e.g.

- What is a complex geodesic?
- The home of the classical geodesic flow is the unit tangent bundle and an important special case is when the base manifold is a compact Riemannian manifold of negative curvature; in this case the geodesic flow is an Anosov flow. In contact metric geometry the tangent sphere bundle is an important example and the characteristic vector field (Reeb vector field) of the contact structure is twice the geodesic flow. So what is the complex analogue of the unit tangent bundle?
- Since there is no natural ordering of the complex numbers, how can one have a flow?

We will address these objections and discuss a complex geodesic flow for complex space forms. We will conclude with a discussion of the relation of this problem to complex contact geometry.

Lugar: Seminario del Departamento de Geometría y Topología (Facultad de Matemáticas, 3ª planta, módulo 36).



DPTO. GEOMETRÍA Y TOPOLOGÍA

Título: Catenoids: A Look at Conformal Flatness.

Fecha: Martes, 25 de marzo de 2008.

Hora: 10:00 h.

Resumen:

More than thirty years ago I proved that a minimal, conformally flat hypersurface in Euclidean space E^{n+1} ($n \geq 4$) is either totally geodesic or (a piece of) a generalized catenoid, i.e. a hypersurface of revolution with a unique profile curve, depending on dimension, which for $n=2$ is a catenary. In 1999 I. Castro and F. Urbano introduced a Lagrangian catenoid in C^n and proved that if a minimal, Lagrangian submanifold in C^n is foliated by round $(n-1)$ -spheres, it is homothetic to the Lagrangian catenoid. In view of these two results it is natural to investigate conformally flat, minimal, Lagrangian submanifolds in C^n . If such a submanifold is not totally geodesic, it resembles a Lagrangian catenoid at least to the extent that its Schouten tensor has an eigenvalue of multiplicity one. If the Schouten tensor has at most two eigenvalues, the submanifold is either flat and totally geodesic or is homothetic to the Lagrangian catenoid.

It is well known that a quasi-umbilical submanifold of dimension ≥ 4 of a conformally flat manifold is conformally flat but in general not conversely; e.g. the Lagrangian catenoid of Castro and Urbano is conformally flat but not quasi-umbilical. However a partial converse was given by Moore and Morvan in 1978: If $p \leq \min\{4, n-3\}$, a conformally flat submanifold M^n of Euclidean space E^{n+p} is quasi-umbilical.

Thus we return to the question of a minimal, conformally flat submanifold M^n in Euclidean space E^{n+p} . If $p \leq \min\{4, n-3\}$ and the Schouten tensor has at most two eigenvalues, then M^n is either totally geodesic or homothetic to a generalized catenoid lying in some $n+1$ -dimensional Euclidean space.

Lugar: Seminario del Departamento de Geometría y Topología (Facultad de Matemáticas, 3ª planta, módulo 36).