support surfaces for convex domains of finite 1-type. This is joint work with Fornaess and Diederich.

Vicente Palmer: *Extrinsic isoperimetry, estimates for the capacity, and parabolicity of submanifolds.*

I will talk about geometric conditions that guarantee the parabolicity (non- existence of bounded non-constant and subharmonic functions) or non-parabolicity (existence of such non-constant functions) of a Riemannian manifold. Then, we will see how to use estimates for the capacity of a compact domain in a submanifold under certain curvature restrictions in order to show that this submanifold is non-parabolic.

Barbara Drinovec Drnovšek: *On constructions of analytic discs.*

An analytic disc is a holomorphic map from the unit disc in $\mathbb{C}$ into some target space, for example $\mathbb{C}^n$, which extends continuously up to the boundary. I will solve approximately a nonlinear Riemann-Hilbert boundary value problem and then I will present its applications in constructing analytic discs with certain properties.

Rabah Souam: *The Minkowski problem and surfaces of constant curvature.*

We classify the family of positive constant curvature surfaces in $\mathbb{R}^3$ whose extrinsic conformal structure is biholomorphic to a planar circular domain, and whose Gauss map is a diffeomorphism onto a finitely punctured sphere. We give applications to the generalized Minkowski problem, the existence of harmonic diffeomorphisms between certain domains of $\mathbb{S}^2$, the existence of capillary surfaces in $\mathbb{R}^3$, and the space of solutions to a Hessian equation of Monge-Ampère type. Joint work with Antonio Alarcón.

Franc Forstnerič: *Null curves and directed immersions of Riemann surfaces.*

We study holomorphic immersions of open Riemann surfaces into $\mathbb{C}^n$ whose derivative lies in a conical algebraic subvariety A of $\mathbb{C}^n$ that is smooth away from the origin. Classical examples of such A-immersions include null curves in $\mathbb{C}^3$ which are closely related to minimal surfaces in $\mathbb{R}^n$, and null curves in $\mathrm{SL}_2(\mathbb{C})$ that are related to Bryant surfaces. We establish a basic structure theorem for the set of all A-immersions of a bordered Riemann surface, and we prove several approximation and desingularization theorems. Assuming that A is irreducible and is not contained in any hyperplane, we show that every A-immersion can be approximated by A-embeddings; this holds in particular for null curves in $\mathbb{C}^3$. If in addition $A \setminus \{0\}$ is an Oka manifold, then A-immersions are shown to satisfy the Oka principle, including the Runge and the Mergelyan approximation theorems. Another version of the Oka principle holds when A admits a smooth Oka hyperplane section. This lets us prove in particular that every open Riemann surface is biholomorphic to a properly embedded null curve in $\mathbb{C}^3$.

Workshop

Geometric and Complex Analysis

Granada, 22-23 November 2012

http://www.ugr.es/~alarcon/Meeting/Meeting.html

Organizing Committee

Antonio Alarcón

Franc Forstnerič

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MCYT-FEDER research project MTM2007-61775

MCYT-FEDER research project MTM2011-22547

Departamento de Geometría y Topología

Universidad de Granada

International Scientific Coordination Network Geometric Analysis

Introduction

The Department of Geometry and Topology of the University of Granada will host a two-days conference on November 22-23, 2012.

The aim of the workshop is to bring together people working in Geometric Analysis. The meeting consists of two different sessions; one of them covering the most geometric aspects of submanifold theory and the other one covering the most complex analytic ones.

Speakers

Barbara Drinovec Drnovšek
University of Ljubljana

Franc Forstnerič
University of Ljubljana

Vicente Palmer
University Jaume I, Castellón

Marko Slapar
University of Ljubljana

Marc Soret
Université Franois Rabelais, Tours

Rabah Souam
Institut de Mathematiques de Jussieu, Paris

Martin Traizet
Universite Franois Rabelais, Tours

Erlend Wold
University of Oslo

Workshop

Geometric and Complex Analysis

Granada, 22-23 November 2012

Program

The lectures will take place in the Conference Room on the ground floor of Mathematics building.

Thursday

09:15 - 10:00 Martin Traizet: Higher genus helicoids

10:45 - 11:30 Marko Slapar: CR singular points of real manifolds in complex manifolds

11:30 - 12:15 Marc Soret: Entropies and CMC hypersurfaces

16:00 - 16:45 Erlend Wold: Exposing points on locally convexifiable domains of finite 1-type

16:45 - 17:30 Vicente Palmer: Extrinsic isoperimetry, estimates for the capacity, and parabolicity of submanifolds

Friday

09:00 - 09:45 Barbara Drinovec Drnovšek: On constructions of analytic discs

10:30 - 11:15 Rabah Souam: The Minkowski problem and surfaces of constant curvature

11:15 - 12:00 Franc Forstnerič: Null curves and directed immersions of Riemann surfaces

Martin Traizet: *Higher genus helicoids.*

I will talk about the existence of higher genus helicoids in $\mathbb{S}^2 \times \mathbb{R}$ and $\mathbb{R}^3$. This is a joint work with David Hoffman and Brian White.

Marko Slapar: *CR singular points of real manifolds in complex manifolds*

Let M be an m-dimensional real manifold, generically embedded in a complex n-dimensional manifold (X, J). For a point $p \in M$, the expected dimension of the maximal complex subspace of T_pM is $m-n$. Points in M where this dimension is strictly more than $m-n$ are called CR singular. We will give an overview of the well developed theory of CR singular points of real surfaces in complex surfaces and then show some more recent results about CR singular points in higher dimensions.

Marc Soret: *Entropies and CMC hypersurfaces.*

Let M be a complete, noncompact constant mean curvature hypersurface of *finite index* in $\mathbb{R}^{n+1}$. We show that if either M has zero volume entropy, or *zero* total curvature *entropy* and $n \leq 5$, or has bounded curvature and is properly embedded, then M is minimal. We obtain similar results in more general ambient manifolds. Moreover the article contains some results of independent interest, about the volume entropy *and the bottom of the essential spectrum.*

Erlend Wold: *Exposing points on locally convexifiable domains of finite 1-type.*

We will start by explaining how to embed a smoothly bounded strongly pseudoconvex domain in $\mathbb{C}^n$, to globally expose a given point on the boundary. The motivation comes from a question about existence of a positive squeezing radius. The technique is an adaption of techniques for exposing points on boundaries of Riemann surfaces in $\mathbb{C}^2$ due to Forstnerič-Wold. We will then proceed to explain how the techniques can be used to construct smooth parameter families of global