# V - WENLU - Workshop em Equações Diferenciais não Lineares da UFPB - Verão 2016

João Pessoa, 16 a 19 de Fevereiro , 2016

**Title: Some classes of elliptic problems with singular nonlinearities** Title of your talk

**Authors: J. M. do Ó, R. Clemente**  Names of the authors

**Abstract: Singular elliptic problems has been extensively studied and it has attracted the attention of many research in various contexts and applications. The purpose of this work is to study singular elliptic problems in riemannian manifolds. We investigate a semilinear elliptic problem involving singular nonlinearities and advection and we prove the existence of a parameter $\lambda^* > 0$ such that for $\lambda \in (0, \lambda^*)$ there exists a minimal classical solution which is semistable and for $\lambda > \lambda^*$ there are no solutions of any kind. Futhermore we obtain $L^p$ estimates for minimal solutions uniformly in $\lambda$ and determine the critical dimension for this class of problems. As an application, we prove that the extremal solution is classical whenever the dimension of the riemannian manifold is below the critical dimension. We analyse the branch of minimal solutions and we prove multiplicity of solutions close to extremal parameter. We also prove symmetry and monotonicity properties for the class of semistable solutions and we prove $L^\infty$ estimates for the extremal solution. Moreover, we study a class of problems involving the $p-$Laplace Beltrami operator in a geodesic ball of a riemannian model and we establish $L^\infty$ and $W^{1,p}$ estimates for semistable, radially symmetric and decreasing solutions. As an application we prove regularity results for extremal solution of a quasilinear elliptic problem with Dirichlet boundary conditions. In the last chapter we study an elliptic system and we prove the existence of a curve which splits the positive quadrant of the plane into two disjoint sets, where there is classical solution while in the other there is no solution. We establish upper and lower estimates for the critical curve and regularity results for solutions on this curve.** Abstract of the talk

1