Graduate Student Seminar

UNIVERSITY OF NOTRE DAME

Department of Mathematics

Speaker: Luis Saumell
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Monday, February 29, 2016
4:00 PM
229 Hayes-Healy Hall

Title: D-Modules, Bernstein's inequality and some of its consequences

Abstract:

Our notion of D - Module will be that of a module over the nth Weyl Algebra. We will look at filtrations and use this to define a notion of dimension and multiplicity for D - Modules. Soon after this, Bernstein's inequality makes its grand entrance. Before going into the proof, we will see some consequences among which we discuss the category of Holonomic D - Modules (it will turn out to be Abelian and Artinian) and the existence of the Bernstein-Sato polynomial. After convincing ourselves (hopefully) that Bernstein's inequality is useful, we delve into its proof! Here there will be two roads to take: a purely algebraic one or a more "geometric" one using Characteristic Varieties (here Algebraic Geometry and (some) Symplectic Geometry make their clear appearance). Depending on time I will choose one or another... To conclude, I want to mention the connection to Perverse Sheaves via the Riemann-Hilbert Correspondence and finally say something about some questions I am thinking about!