SOPHIA VASSILIADOU, Department of Mathematics, Georgetown University, Washington, DC 20057
L^2-cohomology of some complex spaces with singularities

Let X be an irreducible complex analytic set in $\mathbb{C}^N$ (resp. complex projective variety in $\mathbb{CP}^N$) with arbitrary singular locus. Let X' denote the set of smooth points in X. The restriction on X' of the Euclidean metric in $\mathbb{C}^N$ (resp. the Fubini–Study metric in $\mathbb{CP}^N$) induces an incomplete metric on X', which we call the ambient metric. Let D denote the weak (distributional) de Rham or Dolbeault operator acting on square integrable forms (with respect to the ambient metric) on X'. We wish to understand when can we solve $Du = f$ on X' with L^2-estimates and how big (if non-trivial) is the space of obstructions.

In the first part of the talk we shall see how results about these two operators are connected. In the second part of the talk I will survey some results we have obtained with Nils Øvrelid that shed some light on the above problem.