SYLLABUS

Geometric Measure Theory in Geometry and Complex Analysis

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This course is an introduction to the main ideas and results in Geometric Measure Theory with an eye towards applications to minimal varieties in riemannian geometry and positivity conditions in complex analysis. We will continue as follows

1. Sheaf Theory
2. Applications to Forms and currents
   - the classical theorems of de Rham.
   - Poincaré Duality.
3. Currents of finite mass
   - structure theorems
   - compactness theorems
   - homology.
4. Flat currents
   - structure theorems
   - homology
   - the Federer Flat Support Theorem.
5. Rectifiable currents
   - homology
   - the Deformation Theorem
   - the Compactness Theorem
6. Flat currents modulo k
7. Minimal currents and the Plateau problem in Riemannian geometry
   - First and Second Variational Formulas
   - Monotonicity
   - Review of regularity theory
8. De Rham currents on complex manifolds
   - The Dolbeault Theorem for forms and currents
   - Serre Duality
9. Positive currents in complex analysis
   - minimizing properties
   - compactness
   - densities and Lelong numbers
10. Positive rectifiable currents
    - The King Theorem
    - The Harvey-Shiffman Theorem
    - Characterization of projective algebraic subvarieties