

# POTENTIAL THEORY IN A GENERAL GEOMETRIC SETTING

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## ABSTRACT

Classical potential theory centers around the concept of subharmonic function. One natural extension is to plurisubharmonic functions in the theory of several complex variables. In joint work with Blaine Lawson a broad extension is made which includes many new examples, including:

- (1) Lagrangian plurisubharmonic functions in symplectic geometry.
- (2) Special Lagrangian plurisubharmonic functions on Ricci-flat Kähler manifolds (Calabi-Yau manifolds).
- (3) Quaternionic plurisubharmonic functions on hyper-Kähler manifolds.
- (4) Associative plurisubharmonic functions on  $G_2$ -manifolds.
- (5)  $\phi$ -plurisubharmonic functions on any calibrated manifold with calibration  $\phi$ . (This includes (2), (3) and (4) above.)
- (6)  $p$ -convex functions on a riemannian manifold. (The case  $p = 1$  is ordinary convexity.)
- (7)  $p$ -plurisubharmonic functions on a hermitian manifold. (The case  $p = 1$  is ordinary plurisubharmonicity.)

The lecture will emphasize  $\mathbf{R}^n$ . New results will be discussed, including: a restriction theorem, existence and uniqueness for the Dirichlet problem, topological restrictions on “convex” domains (in cases (1)—(6)), and the appropriate analogue of the Grauert Tubular Neighborhood Theorem