

## Title: The Dirichlet Principle – Historical Development

Abstract: This is the first of a two-part series of seminars on the Dirichlet Problem. No background is essential, as preliminary concepts will be covered in the first presentation. This talk is a survey intended to trace the intellectual evolution of a major source of mathematical research and inspiration. The following topics will be addressed:

- Cauchy-Riemann equations
- Laplace's equation
- Harmonic/sub/superharmonic functions
- Mean value theorems
- Heat and the heat equation
- Poisson's development
- Weierstrass' counterexample to Riemann's Dirichlet principle and Schwarz's contributions (mid 1800's)

### References:

J.B. Conway, *Functions of one complex variable*, GTM, Springer (1978)

or similar complex analysis book such as:

L. Ahlfors, *Complex Analysis*, McGraw-Hill (1979)

C.A. Berenstein-R. Gay, *Complex Variables, An Introduction*, GTM, Springer (1991)