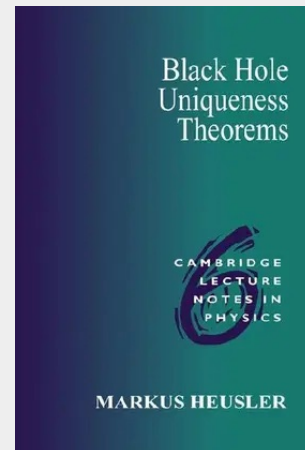


## Black Hole Uniqueness Theorems

This timely review provides a self-contained introduction to the mathematical theory of stationary black holes and a self-consistent exposition of the corresponding uniqueness theorems. The opening chapters examine the general properties of space-times admitting Killing fields and derive the Kerr-Newman metric. Strong emphasis is given to the geometrical concepts. The general features of stationary black holes and the laws of black hole mechanics are then reviewed. Critical steps towards the proof of the 'no-hair' theorem are then discussed, including the methods used by Israel, the divergence formulae derived by Carter, Robinson and others, and finally the sigma model identities and the positive mass theorem. The book is rounded off with an extension of the electro-vacuum uniqueness theorem to self-gravitating scalar fields and harmonic mappings. This volume provides a rigorous textbook for graduate students in physics and mathematics. It also offers an invaluable, up-to-date reference for researchers in mathematical physics, general relativity and astrophysics.

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