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general case -- Gluing in the Morse--Bott case -- The Floer homology groups -- Compactness properties -- Floer's instanton homology groups -- Independence of metric -- Orientations -- Deforming the equations -- Transversality arguments -- U(2) and SO(3) connections -- Floer homology and 4-manifold invariants -- The conceptual picture -- The straightforward case -- Review of invariants for closed 4-manifolds -- Invariants for manifolds with boundary and b[superscript +]] 1 -- Reducible connections and cup products -- The maps D [subscript 1], D[subscript 2] -- Manifolds with b[superscript +] = 0, 1 -- The case b[superscript +] = 1.

| Sommario/riassunto | The concept of Floer homology was one of the most striking developments in differential geometry. It yields rigorously defined invariants which can be viewed as homology groups of infinite-dimensional cycles. The ideas led to great advances in the areas of low-dimensional topology and symplectic geometry and are intimately related to developments in Quantum Field Theory. The first half of this book gives a thorough account of Floer's construction in the context of gauge theory over 3 and 4-dimensional manifolds. The second half works out some further technical developments of the theory, and the final chapter outlines some research developments for the future - including a discussion of the appearance of modular forms in the theory. The scope of the material in this book means that it will appeal to graduate students as well as those on the frontiers of the subject. |