

# W Mesons Encyclopedia Article

## W Mesons

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# W Mesons

W mesons, or W bosons, are heavy charged particles that mediate the weak nuclear interaction. In standard high-energy units, they have a **mass** of 81 GeV. There are two varieties, the  $W^+$  with charge  $+e$ , and its **antiparticle**, the  $W^-$ , with charge  $-e$ . The W bosons are some of the heaviest elementary particles, with a mass comparable to that of a krypton **nucleus**. They have a very short lifetime on order of  $10^{-27}$  seconds, which requires that they be detected by looking for specific decay signatures in **particle detectors**. They were predicted to exist in the late 1960s and early 1970s by the unified **electroweak theory**, and were eventually detected in the mid-1980s at the large **electron positron** collider, LEP, at the European Center for Nuclear Research (CERN) near Geneva, Switzerland.