

54.3: The Cavendish Experiment

Determining the universal gravitational constant G is a fairly difficult problem because of the weakness of the gravitational force. The problem was solved in a famous experiment by the English physicist Henry Cavendish. In his experiment, Cavendish attached two heavy masses to the ends of a rod; the rod was then suspended at its balance point from a vertical wire that was attached to the ceiling, forming a torsional pendulum. Two very large stationary masses were then placed next to the two suspended masses, so that each mass on the rod was adjacent to one of the large stationary masses. The gravitational attractive force between the masses caused the rod to rotate slightly. From knowing the masses, their separation, the torsional "Hooke's law" constant κ , and the angle of rotation, Cavendish was able to determine the value of G .

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