**Plenarvortrag** PV III Mi 9:00 VMP4 Audimax 1

**Microscopic black holes and their significance in quantum theories of gravity** — •Gerard 't Hooft — Institute for Theoretical Physics, Universiteit Utrecht, Leuvenlaan 4, 3584 CC Utrecht

Black holes are fundamental solutions of Einstein's equations for the gravitational field. There is one free parameter, the size, or equivalently, the mass. Astronomers see only black holes heavier than the sun, but according to the equations, black holes could have any size, allowing them to be smaller than elementary particles, and weigh only milligrams. They should behave as elementary particles themselves, but here we encounter serious difficulties. Just by demanding that the theory should give meaningful descriptions of such black holes, one can obtain important information, both about black holes and about gravitation itself. How should we look at that mysterious surface of a black hole, known as its horizon?