



Arnold Sommerfeld

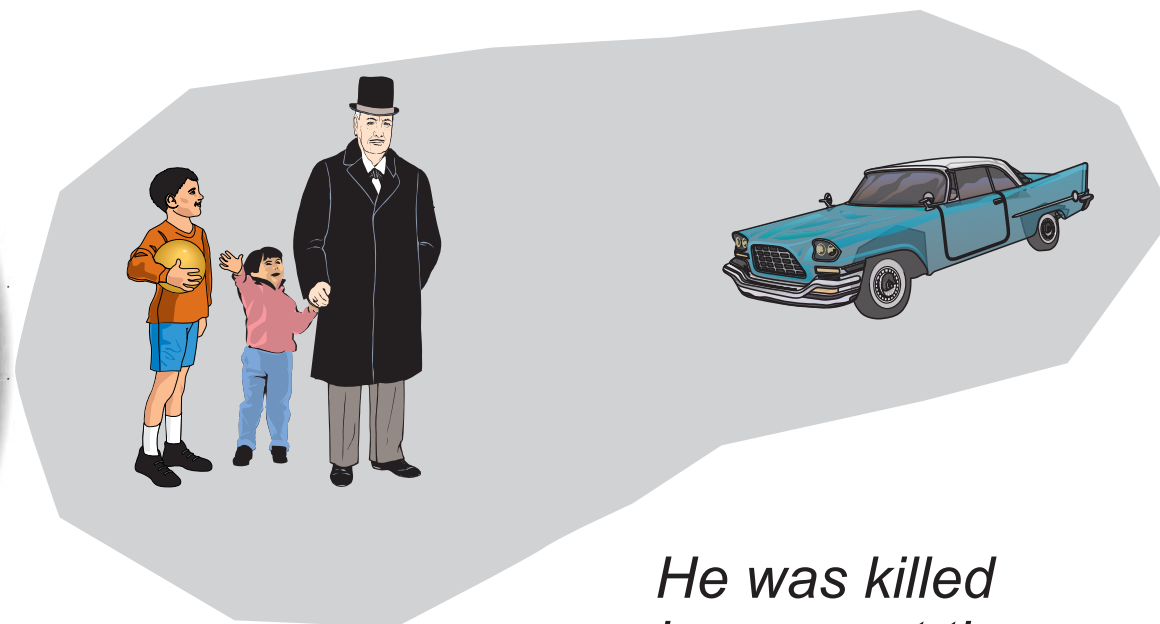
1868 - 1951

Arnold Johannes Wilhelm Sommerfeld was a famous theoretical physicist. He is well-known for his work on the quantum theory of atoms, the quantum theory of metals and mathematical physics.

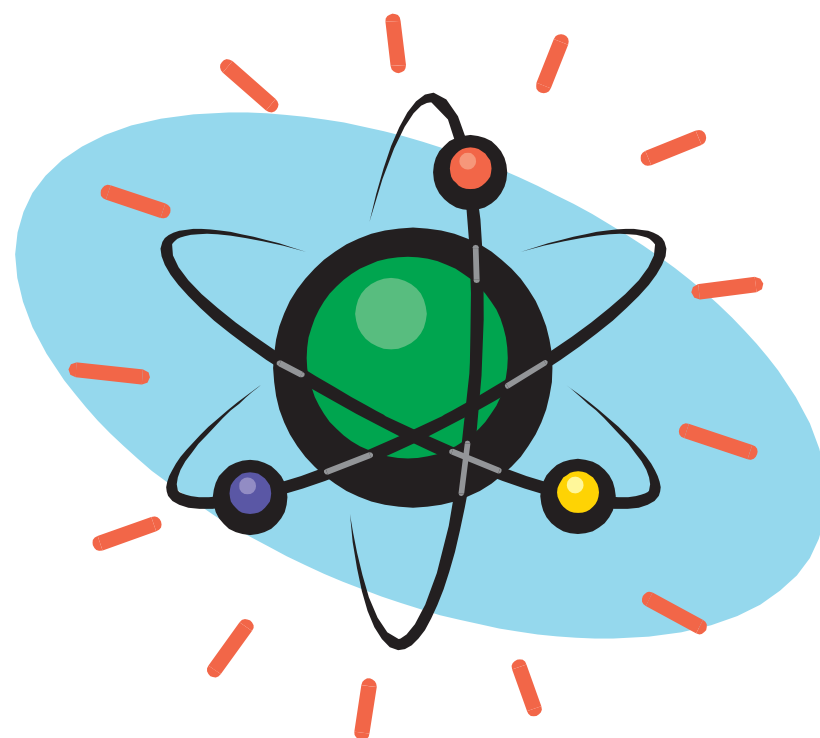
According to Bohr's atomic model an atom consists of a central nucleus around which electrons move in definite circular orbits. Electrons can occupy only certain orbits. If electrons 'jump' to lower levels they emit photons or if electrons 'jump' to higher orbit they absorb photons of the appropriate frequency. These levels correspond to certain quantum numbers. When Sommerfeld studied carefully the spectral lines of hydrogen (the most simple atom) he noticed that a single line in the spectrum really consists of a number of lines close together. His solution was to assume that electrons moved in elliptical rather than circular orbits. He suggested that this problem required introducing a second quantum number, the azimuthal quantum number, l , in addition to the principal quantum number of Bohr, n .

Sommerfeld was also known as the author of a very well known students textbook: *Atomic structure and Spectral lines*.

Sommerfeld was born in Königsberg, (now Kaliningrad, Russia). His father was a physician. He studied mathematics and natural science at the University of Königsberg.



*He was killed
by a car at the
age of 83*



*He had the idea
of elliptical orbits
for electrons in atoms*

After two years as a lecturer on advanced topics at Göttingen he became, in 1897, professor of mathematics at the Bergakademie at Clausthal. Although the salary was not large, it allowed him to marry. His bride, Johanna Hopfner, was the daughter of the Kurator of the University of Göttingen. Jointly with the mathematician Klein he began, in 1897, the preparation of a four volume treatise on the gyroscope that was to take thirteen years to complete.

In 1900, Sommerfeld moved to Aachen and later to Munich University as the director of the Institute of Theoretical Physics, specially established for him. During his Munich period he developed the theory of atoms and postulated a new, azimuthal quantum number.

As his contemporaries say Sommerfeld was not tall, however his virility was attested by a long scar on the forehead - gained during his year of obligatory military service. In middle age, with turned-up waxed moustache, he managed to give the impression of a colonel of the hussars. He took real pleasure in the company of his students and took them on strenuous outings in the Bavarian Alps.

Through World War II Sommerfeld occupied himself with the preparation for publication of his six-semester cycle of lectures on theoretical physics. At the end, already eighty years old, he resumed the directorship of the Institute of Theoretical Physics, but continued his lectures for several years. Early in April 1951, while strolling with his grandchildren, he was struck by an automobile and died a few weeks later.

S.E.