Question 19143

According to classical electrodynamics, electron, as a charged particle, which moves with acceleration, must be radiating energy. If it moves around the nucleus with accordance to classical mechanics, it must fall on the nucleus (because there is a loss of energy because of radiation).

But, as it was found, electron can not be treated as a classical particle (it is too tiny, so here one should use quantum mechanics). There is only probability to find electron in some infinitely small volume around given point. For example, for s-state in hydrogen atom, the wave function is Ae^{-r}, where r denotes the distance to the nucleus. So, the probability density is $A^2e^{-r^2}$. Hence, formally, the biggest probability is to find electron very closely to the nucleus. But, also there is Heisenberg uncertainty principle, so electron can not fall on the nucleus. Also, while the motion is chaotic, though, the law of conservation of energy works.