Kerim Guseynov Mar 12

3-minute talk about Andre Geim

Andre Geim quotes Samuel Goldwyn: "I don't think anyone should write their autobiography until after they're dead." Nonetheless, it's a tradition to tell about oneself when awarded the Nobel Prize, so Andre Geim did.

We are most interested in his career, but it would not have turned out the way it did if not his earlier years. So a few words about them. His parents wanted him to study well and did a lot for it. He had many tutors in maths, physics, and Russian literature. The largest impact had the physics tutor, who taught him to solve problems from both ends and encouraged his interest in physics and specifically cosmology. He applied to Moscow Institute of Physics and Technology, where he had some great years and was taught to logically analyze and grasp everything. A unique feature of MIPT education was that students were able to easily combine different subjects to solve very complex problems that were much closer to real life.

Despite Geim's interest in cosmology, at the university and later he explored solid state physics. For his Master's degree he studied electronic properties of medals by exciting electromagnetic waves in spherical samples of ultrapure indium. Geim worked on his PhD in the same laboratory and investigated mechanisms of transport relaxation in metals by an electromagnetic waves resonance method. This topic was not very promising, and Geim says he learned from it that he should not force students to work on zombie projects.

After his PhD, he tried different fields of solid state physics and finally found his own niche, different from the almost-boring PhD topic. Geim constructed a system with highly inhomogeneous magnetic field provided by a superconductor and studied electron transitions in a metal film subjected to the field. The scale of the magnetic field inhomogeneity was the key feature of his work. Geim had investigated this type of systems for a few years and then caught an opportunity to visit a foreign university. It happened to be Nottingham University, where he worked with older samples due to limited time, but still wrote two articles as a result. After that Geim didn't want to return to the Soviet Union and decided to apply to different universities. Over the next few years he had worked at universities at Nottingham, Copenhagen, and Bath. It broadened his field of study dramatically and ultimately let him conduct his research on graphene, which led to some outstanding results and obviously his Nobel Prize.