Nanotechnology at IBM Zurich Research Laboratory

IBM Software Group

Welcome to the podcast on the topic of nanotechnology. Being interviewed here are Karl Arnold, manager in the Solution Sales sector within the Systems and Technology Group, STG, of IBM Switzerland, as well as Dr. Paul Seidler, Department Manager Science and Technology in the IBM lab in Rüschlikon. They will explain the merits and the potential of nanotechnology. The interview was conducted by Manuela Kerker.

Manuela Kerker: "Mr Arnold, you work in the STG area and are the organizer of the IBM Technology Forum. Could you please tell us a little about yourself and your job at IBM?"

Karl Arnold:: "I have worked for IBM for many years in various sectors. Currently, I am managing two sectors within the Systems and Technology Group; Solution Sales and Platform Management."

Manuela Kerker:: "Why did you choose the topic of nanotechnology for this forum?"

Karl Arnold:: "We were organizing the Science and Technology Forum for the first time, so it was important to have a topic of fundamental significance. Nanotechnology is an issue that will be of great importance for the future of information technology and also for our daily lives."

Manuela Kerker:: "Doctor Seidler, you work in the IBM research lab in Rüschlikon. Could you also please tell us a little about yourself and your job in the IBM research lab?"

Dr. Paul Seidler:: "I have been with IBM for 20 years. I started in the Watson lab in New York. In 1995 I moved to Switzerland. First of all I led a project in the screen technology field based on so-called organic light emitting diodes. I then became manager of the Science and Technology department, and I have recently acquired a new function; I am responsible for the new nanotechnology center that we are setting up together with the ETH, which means that I am responsible for the dealings with the ETH and also for new partnerships with third parties."

Manuela Kerker:: "What is understood under nanotechnology within the context of information technology?"

Dr. Paul Seidler: "The typical definition of nanotechnology is the analysis and the processing of materials with structures ranging from one to 100 nanometers, whereby new types of effects and phenomena allow for new applications. This is actually a fairly broad definition. For IBM, nanotechnology rather means nanoelectronics."

Manuela Kerker:: "Which aims are pursued with the application of nanotechnology?"

Dr. Paul Seidler:: "Nanotechnology has two sides for information technology: one side is the evolution of transistors, and the other is a revolutionary side. The evolutionary side deals with the further miniaturization of components, of circuitry, which are the transistors. Currently, transistors in the leading technology are less than 100 nanometers. The revolutionary side is then the invention or discovery of new components based on new characteristics or on other properties of physics."

Manuela Kerker:: "Where does the potential of nanotechnology lie for the IT industry of the future?"

Dr. Paul Seidler: "As far as the continued miniaturization of transistors is concerned, the advantages of nanotechnology are actually the same as we have hitherto seen in the miniaturization of transistors. This means more transistors per chip, more functionality and thereby lower costs of chip manufacturing. If the second type of nanotechnology is concerned, i.e. the revolutionary nanotechnology, the hope is that the elements will require significantly less energy."

Manuela Kerker:: "As you have already mentioned, the IBM research lab will in the future work with the ETH Zurich in the field of nanotechnology. What can you tell us about this?"

Dr. Paul Seidler:: "At the end of June 2008, we announced that we would build a new nanotechnology center together with the ETH on the grounds of IBM in Rüschlikon. This is a unique partnership between a company and a university. We are investing a total of 90 million US dollars. 30 million of this is for equipment and facilities in the new building. We are splitting the costs for this 50:50. The building itself will be financed 100% by IBM."

Manuela Kerker:: "What does IBM hope for from the collaboration with the ETH?"

Dr. Paul Seidler: “IBM and the ETH will work together, but we will have both joint and our own projects. The hope is that we do not just share the operation costs, but also that synergies will arise, whereby we can benefit from each other’s knowledge.”

Manuela Kerker: “What fascinates you both personally about nanotechnology?”

Dr. Paul Seidler:: “Well for me personally, what I find extremely interesting is that with these dimensions, you enter a world where the laws of physics are different, and especially, you enter a world where the laws of quantum physics reign. I find this immensely interesting as these rules of quantum physics are completely different.”

Karl Arnold: “Well for my part, I have followed the IT developments for many years, and was almost afraid that the technology could not be developed further due to physical laws. But through nanotechnology, we can forge ahead into a new area so to speak, which again opens up new research opportunities which we desperately need in order to advance our technology further.”

Manuela Kerker:: “Thank you very much for the comprehensive explanations.”