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### Jack S. Kilby: Nobel Prize in Physics of 2000

#### **Biography**

Jack S. Kilby is just one physicist who will be remembered for the years to come. He accomplished many achievements and took part in many projects that helped to further shape the world of physics and science. In 2000 he was awarded with a Nobel Prize for his work in physics on the integrated circuit, which he will be remembered for, along with his other achievements, for many years by everyone.

Jack Kilby was born November 8, 1923 in Jefferson City, Missouri. Shortly after his birth he moved to Great Bend, Kansas, where he spent his childhood years. The city was named after the bend in the river that ran through the town, in the middle of the state. His father ran a small electric company, and coordinated with radio operators. Kilby recalls his father's career as being what led him to take such great interest in electronics as a child. He attended high school in Kansas, and after high school Kilby studied electrical engineering in Illinois at the University of Illinois. Here he studied mostly in electrical power classes, but with his curiosity towards electronics he decided to take vacuum tube engineering physics classes in addition to these. He graduated from the University of Illinois in 1947. He first worked with an electronics manufacturer in Wisconsin that produced pieces for radios, hearing aids, and televisions. After work, he would attend classes at the University of Wisconsin, hoping to achieve a master's

degree in electrical engineering. He remembers facing some challenges from working and attending school at the same time but says he believes it was worth his effort.

He and his wife, Barbara, moved from Wisconsin to Dallas, Texas in 1958. Here he began working with Texas Instruments. Here he worked on electronic component miniaturization. Kilby proved that integrated circuits were possible, and after this he lead teams that made great achievements such as building the first military systems and the first computer incorporating integrated circuits. He also assisted in inventing the handheld calculator and the thermal printer, a device used in portable data terminals.

In 1970 he took a break from Texas Instruments, a job that he described to be the perfect fit for him. He chose to instead begin working individually as an independent inventor so he was able to focus more on applications of integrated circuits. During this leave he worked on multiple projects in addition to those related to his integrated circuits, one being how to produce electrical power through solar sunlight. He formally retired from Texas Instruments in the 1980's, as his break was just a leave of absence, but continued to stay involved with the company, which he loved.

In 1978 he began teaching at Texas A&M University, where he was a "Distinguished Professor" of Electrical Engineering. He argues "The 'distinguished' part is in the eye of the beholder, and I didn't really do much 'professing'." Nevertheless, he says to have enjoyed doing research with both the students he taught and his colleagues who were faculty, and found it to be a rewarding experience. Jack Kilby's wife Barbara died in 1981, a difficult experience for Kilby, and from that point on he devoted himself to her memory until his death, in 2005.

**Nobel Prize**

Jack Kilby received his Nobel Prize in 2000 for his work on the integrated circuit program. He found interest in electronics in general as a child, when his father had built a career around it. He says that the interest that he developed as a child with assistance from his father is the main thing that drove him to work so hard to achieve what he did. He did most of his research on this with Texas Instruments, in Dallas, Texas. He worked along side others to develop this program. A colleague of his recalls that in his first few months at Texas Instruments, he explored a myriad of concepts, but with a poor economic backing the ideas were quickly set aside. During his employee vacation period, he sketched an oscillator circuit formed in situ in a semiconductor substrate. When he returned to work, he presented his idea to the director of development, and shortly after a working model was developed in addition to several logic circuits. With this he began working with the president of Texas Instruments. Jack took a large role in further development of these ideas and in 1962 he was awarded with the development program for application of integrated circuits to the Minuteman II guidance system. He continued his perseverance in developing the integrated circuit and the achievements that he made were countless. Most of his work on this project took place in the 1960's. It was spread out and was broken up into different smaller projects to create one big project. Over a period of time he had eventually created the final work, which, while he took great pride in it, a former colleague says that he did not boast about his achievements as much as he could have for undertaking such a great project. His recognition didn't come until years prior, however. He received more than just the Nobel Prize for Physics in 2000. Some of his other honors included being nominated to be a member of the National Academy of Engineers in 1967, receiving the National Medals of Science and Technology in 1969 and 1990, being awarded the Kyoto Prize in

1995, and he also received multiple other awards and honorary degrees from other profession groups and universities.

Jack S. Kilby is extremely well known for a variety of achievements that he accomplished over his years as a physicist. While he worked on multiple projects, including helping create the hand held calculator and the thermal printer; his most recognized work is certainly that with the integrated circuit, seeing as he won the Nobel Prize for Physics for this in 2000. Kilby died June 20, in 2005 at the age of 81 years old. He died of cancer, but his battle was not very prolonged. His wife died 23 years prior to him, and two daughters, as well as five granddaughters survive him. Jack S. Kilby will unquestionably be remembered for many years, especially in the world of science and physics, and the great progress he made in the world of electronics.

### **Sources**

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