

## Essay Contest 2016/17

Maximilian Pfister, International School Kufstein, 5. Klasse, 5 Jahre Spracherwerb

### The man who never gave up Gerhard Herzberg

A very smart scientist once said that "you shouldn't do science just to improve wealth — do science for the sake of human culture and knowledge"(Herzberg, n.d). This sentence was written by a smart German-Canadian immigrant, who fled from Germany during the reign of Adolf Hitler in 1935. He worked as a chemist and physicist and won a Nobel Prize in Chemistry in 1971 for his effort (?) and participation in the study of electronic structure and geometry of particularly free radicals and even comet 3316 was named after him (Herzberg, n.d). Of course, I am talking about Gerhard Herzberg and I am going to write about why he's my role model and what he did to become such an influential person.

Gerhard Herzberg was born in Hamburg on December 25, 1904. He had a comparably small family considering this time. His parents were called Albin H. Herzberg and Ella Biber and he also had a brother, who was born in January 1904. Herzberg started elementary school late, after various diseases. The family were atheists and kept this a secret for a long time. After his father's death in 1914 at the age of 43, he graduated from elementary school. Shortly after his graduation Herzberg considered a career in astronomy but was rejected from the Hamburg Observatory, due to private financial problems. After completing high school at the Gelehrtenschule des Johanneums, he went to the Darmstadt University of Technology with the help of private sponsors. In 1928 he completed his PhD under Hans Rau with his thesis about the afterglow of nitrogen and oxygen and about the structure of negative nitrogen compounds. From 1930 to 1935 he was Hans Rau's second assistant, but fled to Canada, due to the rules made by Adolf Hitler about Jews, as he was married to the physicist Luise Oettinger, who was of Jewish descent. When he lost his teaching position he quickly realised why he was fired and that something else would happen if they didn't move away from Germany. As it turned out, this had been a wise decision.

In Canada, he was also lucky finding a job. He started his career in Canada as a guest professor at the University of Saskatchewan in Saskatoon and already after 3 months, he got

a full-time job as a research professor for physics. In 1945 he became a Canadian citizen. In the same year, Herzberg received a call to the Yerkes-observatory from the University of Chicago for a professorship for spectroscopy, but he declined. From 1948 onwards, Herzberg worked in the National Research Council in Ottawa. Besides, Herzberg was a long-standing honoured member of the professional advisory board of the Max-Planck's institute of quantum optics in Garching and finally after 30 years of hard work as a physicist and chemist he won the Nobel Prize in chemistry at the age of 67, for his contributions to the knowledge of the electronic structure and geometry of molecules, in particular free radicals. By observing double atomic molecules Herzberg could exactly determine values for dissociation and ionisation energies. In cooperation with the Nobel Prize winners Ronald George Wreyford Norrish and George Porter, he was involved in the development of flashlight spectroscopy. Besides other things, he was very fascinated by researching unstable particles as well as the structure of multi-atomic molecules. Herzberg brought his knowledge also into space research, for example, by verifying that comets have signs of borane and hydrocarbon. He was also known as the first who thought of the cosmic microwave background, which was mentioned in his theory about cosmic rays in his book "Spectra of diatomic molecules" in 1950. In the year 2000, one year after Herzberg's death at the age of 94 in Ottawa, the Canada Gold Medal for Science and Engineering was named after him.

Gerhard Herzberg was a special scientist of his own kind. He studied physics and chemistry. He had a hard childhood but managed to go to high-school, and went to University where he got his PhD. He had a good job and a beautiful wife in Germany, but because his wife was of Jewish descent he was accused of being a Jew and lost every right and his job in Germany. Luckily he fled from Germany timely, before the persecution of the Jews began and he never gave up his dreams. First I thought he was that kind of scientist who goes to a new country and is instantly a hero, but it was completely the other way. Herzberg had a rough time finding employment and even after a long time he only had a part-time job, but he never gave up and got a better job and eventually even won the Nobel Prize. For me, he is a role model, because he never gave up and always tried new things and tried to be as helpful as possible, attributes I try to aspire to. Even though he is dead he will always be in our minds or at least in the minds of scientist for his observations and his ideas. As he said,

you shouldn't do science for the money, you should do it for the future, which I think is completely true. Without people who think for our future and not for their money, our lives would be very different, that's why we need those people. This is why he is my role model.

Bibliography:

*Gerhard Herzberg Biographical*. (n.d.). Retrieved from

<http://nobelprize.org/chemistry/laureates/1971/herzberg-bio.html>

Stoicheff, B. (2002). *An Illustrious Life in Science*. Retrieved from

[https://books.google.at/books?id=tLEus0Kw4aIC&dq=gerhard+herzberg+illustrious&redir\\_esc=y](https://books.google.at/books?id=tLEus0Kw4aIC&dq=gerhard+herzberg+illustrious&redir_esc=y)

*Gerhard Herzberg*. (n.d.). Retrieved from [https://de.wikipedia.org/wiki/Gerhard\\_Herzberg](https://de.wikipedia.org/wiki/Gerhard_Herzberg)