

Wilhelm Conrad Röntgen

Nobel Prize in Physics 1901



Nobel Prize in Physics 1901 “in recognition of the extraordinary service rendered by the discovery of the remarkable rays subsequently named after him.”

* 27 March 1845 in Lennep, Rheinpreussen

† 20 February 1923 in Munich

1869, Doctorate at the University of Zurich

The Dandy and the X-Rays

What would Wilhelm Conrad Röntgen's life have been like without the Zurich years? Any answer must be speculative. All the same, it was at Zurich's ETH (then known as the Federal Polytechnical School) that Röntgen found his way to physics; at the Uni-

versity of Zurich that he obtained his doctorate; and in the restaurant “Grüne Glas” that he met his wife, Anna Bertha Ludwig (1839–1919).

Röntgen's application in 1865 to study at ETH was not entirely voluntary. In his curriculum vitae for the Dean's Office in 1868, he wrote euphemistically: “Not, however, being satisfied with the course of studies at the above university [Utrecht], he determined, on account of the reputation enjoyed by the Zurich school, to transfer to it, and in particular to study applied mathematics.”

Röntgen was three years old when, in 1848, his parents emigrated from Rheinpreussen to his mother's homeland, Holland. He spent his childhood in Apeldoorn, where his father amassed a significant fortune as a draper. Röntgen was obliged to leave high school on account of a schoolboy prank, an event that seriously jeopardized his academic future. He managed to enroll at the University of Utrecht, though not with any prospects of a degree. There, he discovered from a Swiss friend that in Zurich it was possible to graduate without a university entrance qualification.

Röntgen began his studies in the mechanical-technical department of ETH in the winter semester of 1865. He evidently thought little of exerting himself intellectually, and played the elegant dandy, with luxurious lodgings on the Seilergraben. Many an hour was spent rowing on the lake or hiking in the mountains. On a risky tour over the “Leiteri-Weg” on Zurich's Üetliberg, he

had an accident and ended in hospital with a broken arm, having learnt a lesson for life: Röntgen never again took unwise risks in the mountains.

Some of Röntgen's professors had little occasion for delight in their student. His marks were often unsatisfactory, in civil engineering for instance, on a scale of one to six, “diligence two – progress three”. In the fourth quarter of his first year the verdict was ominous: “Passed after warning from the director.” And again in the third quarter of his second year: “Warning from the director.” Röntgen, however, did then apply himself and graduated on 6 August 1868 as a mechanical engineer with very good results.

At ETH, Röntgen had the good fortune to encounter inspiring teachers. The professor who took on the idle

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Röntgen was Gustav Anton Zeuner, professor of mechanical engineering from 1855 to 1871. He also supervised Röntgen's doctoral thesis at the University, and was ultimately most warmly thanked by his pupil for his “readiness to further my knowledge and help clarify my views.”

Röntgen's encounter with the young physicist August Kundt proved a decisive stroke of fate. After completing his



qualification as an engineer, Röntgen was undecided as to his future. Kundt, then a professor at ETH, invited the young man to his laboratory. Here, Röntgen acquired the precision in experimentation for which he was later renowned; Röntgen had been won over to physics. At that time, ETH was not

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authorized to award doctorates. The University was accommodated under the same roof, so it transpired that, in 1869, Röntgen presented his thesis at the University of Zurich, and thus left the city with the title “Dr. phil.” When in 1870 Kundt followed a call to Würzburg, he took Röntgen with him as his assistant. And Röntgen also followed him to the new German University of Strasburg in 1872.

In 1868, Röntgen became engaged to Anna Bertha Ludwig, the daughter of the proprietor of the inn “Zum Grünen Glas”, which was frequented by Dutch students. Her father, who had been forced leave Germany on political grounds, taught fencing not only to the students but also to the actors from the nearby “Aktientheater,” Zurich’s first permanent theatre. He was also an intellectual sparring partner, with an excellent knowledge of Latin. “Bertheli” was, according to Röntgen’s assistant, Ludwig Zehnder, his “most understanding and faithful friend.” For forty years, the Röntgens spent their holidays in Switzerland, often with friends. That Swiss doctors had a commemorative plaque placed on his

“old student digs” at Seilergraben 7 in 1922 “pleased him greatly.”

On 8 November 1895, in his laboratory in Würzburg, Röntgen, now professor of physics, discovered a new type of rays, which he named X-rays. The first known Röntgen image shows the hand of his wife, Bertha. Within a very short space of time, Röntgen’s discovery not only made international headlines, but triggered a veritable tsunami in scientific circles. A Zurich doctor, Röntgen’s colleague from Würzburg, Albert Kölliker, suggested that the new X-rays should be called “Röntgen rays” in honor of their discoverer. In German-speaking countries, an X-ray image is termed a “Röntgenbild” to this day. *Verena E. Müller*

Source: Margrit Wyder: *Einstein und Co. – Nobelpreisträger in Zürich*; Verlag NZZ libro, Zürich 2015 **Illustration:** Aline Telek

Translation: University of Zurich



Conrad Wilhelm Röntgen as a student in Zurich. Photo: German Röntgen Museum



Röntgen met his future wife during his time in Zurich. Photo: German Röntgen Museum



The news of Röntgen's discovery in 1895 electrified the world: The first known X-ray image shows the hand of his wife, Bertha. Photo: German Röntgen Museum