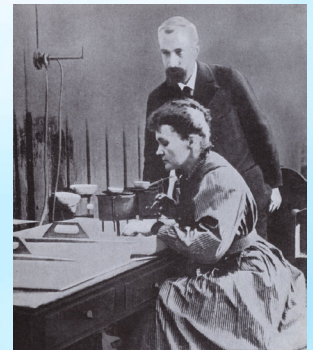


# TIME TRAVEL

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## Marie and Pierre Curie: Early Pioneers of Physics

As European Microwave Week returns to Paris, it seems fitting to feature Marie and Pierre Curie. Pierre Curie was born in Paris in 1859. Building on a strong foundation in mathematics, Curie earned the equivalent of a master's in physical sciences from the University of Paris. To earn money for a doctorate program, Curie worked as a laboratory instructor. It was here that he was introduced to Maria Skłodowska. Skłodowska was born in Warsaw, Poland, in 1867 and followed her elder sister to Paris to study physics, chemistry and mathematics at the University of Paris. Their mutual passion for science and a small lab brought Curie and Skłodowska closer and they were married in 1895, with Skłodowska becoming Marie Curie.

Pierre Curie received his doctorate in 1895, based on his early studies of magnetism. Doing this research with his brother, Pierre is credited with discovering piezoelectricity. He also developed the Curie constant and Curie's Law, which quantifies the effect of temperature on paramagnetism. This earlier work also led to the discovery that ferromagnetic substances have a temperature, now known as the Curie temperature, above which they lose their ferromagnetic behavior.

Despite Pierre's accomplishments, the couple is best known for their work on radiation. In 1895, Wilhelm Röntgen discovered X-rays. In 1896, Henri Becquerel discovered that uranium salts emitted radiation that resembled X-rays and Marie began investigating uranium radiation for a possible thesis.

Using a device developed by Pierre and his brother during their magnetism investigations, Marie discovered that the air around a sample of uranium was electrically charged. Based on this, she hypothesized that the uranium radiation came from the atom and not from the interaction of molecules. This became an important step in proving that an atom was not indivisible. Marie became intrigued by material radiation and began investigating the radiation properties of other substances.

Together, the Curies made groundbreaking discoveries that revolutionized our understanding of the natural world. They discovered two previously unknown elements, polonium and radium, both of which were more radioactive than uranium. Their pioneering work led to the coining of the term "radioactivity." Recognizing the magnitude of their contributions, the Curies, along with Becquerel, were awarded the 1903 Nobel Prize in Physics, with Marie becoming the first woman to receive this honor.

Despite that success, the following years were turbulent. Pierre died crossing the street in Paris and Marie continued to fight sexism, xenophobia and scandal in France while continuing efforts to secure more lab funding. Despite developing an international standard for radioactive emissions, the curie, she failed to gain admission to the French Academy of Sciences.

But there were accomplishments. Marie accepted a chair, making her the first female professor at the University of Paris. As the importance of her work became better understood, Marie won a Nobel Prize in Chemistry in 1911. With that, she became the first person to win or share two Nobel Prizes and the first person and only woman to win in two different fields.

Marie's dedication to understanding radiation continued until her death in 1934. Many attributed her death to the passion of her life; the damaging effects of ionizing radiation, which were not understood at the time. With her passing, the couple who did so much to understand radiation were once again reunited in a cemetery outside Paris.