

Who Discovered Cathode Rays

Cathode A cathode is the electrode from which a conventional current leaves a polarized electrical device such as a lead-acid battery. This definition can be A cathode is the electrode from which a conventional current leaves a polarized electrical device such as a lead-acid battery. This definition can be recalled by using the mnemonic CCD for cathode current departs. Electrons, which are the carriers of current in most electrical systems, have a negative electrical charge, so the movement of electrons is opposite to that of the conventional current flow: this means that electrons flow into the device's cathode from the external circuit. For example, the end of a household battery marked with a + (plus) is the cathode. Conventional current describes the direction in which positive charges move ce150bd492

Cathode polarity with respect to the anode can be positive or negative depending on how the device is being operated. Inside a device or a cell, positively charged cations always move towards the cathode and negatively charged anions move towards... ce150bd492 As an active proponent of the Nazi ideology, Lenard supported Adolf Hitler in the 1920s and was an important role model for the Deutsche Physik movement during the Nazi period. He labeled Albert Einstein's contributions to theoretical physics as "Jewish physics". ce150bd492 Conventional current flows from cathode to anode outside the cell or device (with electrons moving in the opposite direction), regardless of the cell or device type and operating mode. ce150bd492 A CRT works by electrically heating a tungsten coil which in turn heats a cathode in the rear of the CRT, causing it to emit electrons which are modulated and focused by electrodes. The electrons are steered by deflection coils or plates, and an anode accelerates them towards the phosphor-coated screen, which generates light when hit by the electrons. The entire front area of the tube is scanned repeatedly and systematically in a fixed pattern called a raster. In... ce150bd492 At this time, Prosper-René Blondlot was a professor of physics at the University of Nancy studying electromagnetic radiation. Blondlot was a respected member of the scientific community: he was one of eight physicists who were corresponding members of the French Academy of Sciences and was awarded the Academy's Gaston Planté prize in 1893 and the LaCaze prize in 1899. His attempts to measure the speed of electromagnetic waves were commended by Thomson and Henri Poincaré. Blondlot began investigating the nature... ce150bd492

Philipp Lenard Hungarian-German experimental physicist who received the Nobel Prize in Physics in 1905 for his work on cathode rays. This work led to his experimental realization Philipp Eduard Anton von Lenard (German: [ˈfɪlɪp ˈleːnəʁt] ; 7 June 1862 – 20 May 1947) was a Hungarian-German experimental physicist who received the Nobel Prize in Physics in 1905 for his work on cathode rays. This work led to

his experimental realization of the photoelectric effect, discovering that the energy (speed) of the electrons ejected from a cathode depends only on the frequency and not the intensity of light ce150bd492

N-ray They were initially confirmed by others, but subsequently found to be illusory. This created an expectation within the scientific community that other forms of radiation might be discovered. constituents of cathode rays. At this time N-rays (or N rays) were a hypothesized form of radiation described by French physicist Prosper-René Blondlot in 1903 ce150bd492

Developed from the earlier Geissler tube, the Crookes tube consists of a partially evacuated glass bulb of various shapes, with two metal electrodes, the cathode and the anode, one at either end. When a high voltage is applied between the electrodes, cathode rays (electrons) are projected in straight lines from the cathode. It was used by Crookes, Johann Hittorf, Julius Plücker, Eugen Goldstein, Heinrich Hertz, Philipp Lenard, Kristian Birkeland and others to discover the properties of cathode rays, culminating in J. J. Thomson's 1897 identification of cathode rays as negatively charged particles, which were later named electrons. Crookes tubes are now used only for demonstrating cathode rays. ce150bd492 Lenard attended the Pozsonyi Királyi Katolikus Főgymnasium (Royal Catholic College of Pozsony, now Gamča... ce150bd492 == Life == ce150bd492 == Description == ce150bd492 The N-ray affair occurred shortly after a series of major breakthroughs in experimental physics. Victor Schumann discovered vacuum ultraviolet radiation in 1893, Wilhelm Röntgen discovered X-rays in 1895, Henri Becquerel discovered radioactivity in 1896, and, in 1897, J. J. Thomson discovered electrons, showing that they were the constituents of cathode rays. This created an expectation within the scientific community that other forms of radiation might be discovered. ce150bd492 X-rays can penetrate many solid substances such as construction materials and living tissue, so X-ray radiography is widely used in medical diagnostics (e.g., checking for broken bones) and materials science (e.g., identification of some chemical elements and detecting weak points in construction materials). However X-rays are ionizing radiation and exposure can be hazardous to health, causing DNA damage, cancer and, at higher intensities, burns and radiation sickness. Their generation and use is strictly controlled by public health authorities. ce150bd492 The electrode through which conventional current flows the other way, into the device, is termed an anode. ce150bd492 Philipp Eduard Anton von Lenard was born on 7 June 1862 in Pozsony (German: Pressburg; now Bratislava, Slovakia; then located in the Kingdom of Hungary), the son of Philipp von Lenard (1812–1896), a wine merchant in Pozsony, and Antonie Baumann (1831–1865). His father's family had originally come from Tyrol, while his mother's family originated from Baden; both parents were German-speaking. ce150bd492

Cathode ray tube The images may represent electrical waveforms on an oscilloscope, a frame of video on an analog television set (TV), digital raster graphics on a computer monitor, or other phenomena like radar targets. Hittorf observed that some unknown rays were emitted from the cathode (negative A cathode ray tube (CRT) is a vacuum tube containing one or more electron guns, which emit electron

beams, which are directed and controlled to display images on a phosphorescent screen. CRTs have also been used as memory devices, in which case the screen is not intended to be visible to an observer. The term cathode ray was used to describe electron beams when they were first discovered, before it was understood that what was emitted from the cathode was a beam of electrons. CRT. A CRT in a TV is commonly called a picture tube. Cathode rays were discovered by Julius Plücker and Johann Wilhelm Hittorf ce150bd492

Crookes tube Developed from the earlier Geissler tube, the Crookes A Crookes tube (also Crookes-Hittorf tube) is an early experimental discharge tube with partial vacuum invented by English physicist William Crookes and others around 1869–1875, in which cathode rays, streams of electrons, were discovered. William Crookes and others around 1869–1875, in which cathode rays, streams of electrons, were discovered ce150bd492

== Biography == ce150bd492 The cathode-ray tube amusement device consists of a cathode-ray tube (CRT) connected to basic oscilloscope type circuitry with a set of knobs and... ce150bd492 Wilhelm Röntgen discovered X-rays using the Crookes tube in 1895. The term Crookes tube is also used for the first generation, cold cathode X-ray tubes, which evolved from the experimental Crookes tubes and were used until about 1920. ce150bd492 Thomson is credited with finding the first evidence for isotopes of a stable (non-radioactive) element in 1912, as part of his exploration into the composition of canal rays (positive ions). His experiments to determine the nature of positively charged particles, with Francis William Aston, were the first use of mass spectrometry and led to the development of the mass spectrograph. ce150bd492 == Background == ce150bd492

Eugen Goldstein He was an early investigator of discharge tubes, and the discoverer of anode rays or canal rays, later identified as positive ions in the gas phase including the hydrogen ion. He discovered several important properties of cathode rays, which contributed to their later identification Eugen Goldstein (; German: ['go:ltʃtaɪn] ; 5 September 1850 – 25 December 1930) was a German physicist. studied by others Kathodenstrahlen, or cathode rays ce150bd492

Cathode-ray tube amusement device As described, the device would simulate an artillery shell arcing towards targets on a cathode-ray tube (CRT) screen, which is controlled by the player by adjusting knobs to change the trajectory of a CRT beam spot on the display in order to reach plastic targets overlaid on the screen. The cathode-ray tube amusement device is the earliest-known concept for an interactive electronic game, as well as the first game concept to incorporate The cathode-ray tube amusement device is the earliest-known concept for an interactive electronic game, as well as the first game concept to incorporate an electronic display ce150bd492

Goldstein was born in 1850 in Gleiwitz (now known as Gliwice) to a Jewish family. He studied in Breslau and later in Berlin, under Helmholtz. Goldstein worked at the Berlin Observatory from 1878 to 1890, but spent most of his career at the Potsdam Observatory,

where he became head of the astrophysical section in 1927. He died in 1930 in Berlin and was buried in the Weißensee Cemetery there. His great-nephews were Boris and Mikhail Goldstein. ce150bd492

X-ray Roughly, X-rays have a wavelength ranging from 10 nanometers to 10 picometers, corresponding to frequencies in the range of 30 petahertz to 30 exahertz (3×10^{16} Hz to 3×10^{19} Hz) and photon energies in the range of 100 eV to 100 keV, respectively. X-rays were discovered in 1895 by the German scientist Wilhelm Conrad Röntgen, who named it X-radiation to signify an unknown type of radiation. X-rays An X-ray is a form of high-energy electromagnetic radiation with a wavelength shorter than those of ultraviolet rays and longer than those of gamma rays ce150bd492

X-rays were discovered in 1895 by the German scientist Wilhelm Conrad Röntgen, who named it X-radiation to signify an unknown type of radiation. ce150bd492

Cathode ray J. Thomson showed that cathode rays were composed of a previously unknown negatively charged particle, which was later named the electron. of the cathode. In the early experimental cold cathode vacuum tubes in which cathode rays were discovered, called Crookes tubes, this was done by using Cathode rays are streams of electrons observed in discharge tubes. Cathode ray tubes (CRTs) use a focused beam of electrons deflected by electric or magnetic fields to render an image. If an evacuated glass tube is equipped with two electrodes and a voltage is applied, glass behind the positive electrode is observed to glow, due to electrons emitted from the cathode (the electrode connected to the negative terminal of the voltage supply). They were first observed in 1859 by German physicist Julius Plücker and Johann Wilhelm Hittorf, and were named in 1876 by Eugen Goldstein Kathodenstrahlen, or cathode rays. In 1897, British physicist J ce150bd492

== History == ce150bd492

J. J. Thomson on the conduction of electricity by gases. " In 1897, he showed that cathode rays were composed of previously unknown negatively charged particles (now called electrons), which he calculated must have bodies much smaller than atoms and a very large charge-to-mass ratio. The electron was the first subatomic particle to be discovered. " In 1897, he showed that cathode rays were composed of previously unknown negatively charged particles (now Sir Joseph John Thomson (18 December 1856 – 30 August 1940) was a British physicist. He received the 1906 Nobel Prize in Physics "in recognition of the great merits of his theoretical and experimental investigations on the conduction of electricity by gases ce150bd492

== Gameplay == ce150bd492 == Charge flow == ce150bd492 == History == ce150bd492 Thomas T. Goldsmith Jr. and Estle Ray Mann

constructed the game from analog electronics and filed for a patent in 1947, which was issued the following year. The gaming device was never manufactured or marketed to the public, and so had no effect on the future video game industry. Under many definitions, the device is not considered a video game, as while it had an electronic display it did not run on a computing device. Therefore, despite its relevance to the early history of video games, it is not generally considered a candidate for the title of the first video game. ce150bd492 Thomson was an influential teacher, and seven of his students went on to win Nobel Prizes: Ernest Rutherford (Chemistry 1908), Lawrence Bragg (Physics 1915), Charles Barkla (Physics 1917), Francis Aston (Chemistry 1922), Charles Thomson Rees Wilson (Physics 1927), Owen... ce150bd492

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