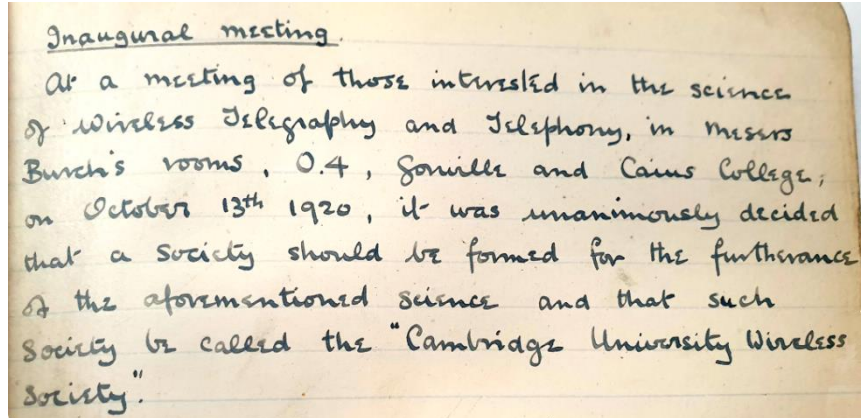


# 100 years of CUWS

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## Nobel Prize winners join the Wireless Society

The Cambridge University Wireless Society is celebrating its centenary, having been founded in October 1920. The hand written minute book, now in the University Library, reports that “At a meeting of those interested in the science of wireless telegraphy and telephony in Messrs Burch’s rooms, O4, Gonville and Caius College, on October 13th 1920, it was unanimously decided that a society should be formed for the furtherance of the aforementioned science and that such a society should be called the “Cambridge University Wireless Society”.



Wireless in Cambridge goes back even further. Ernest Rutherford, as a post-graduate student under J. J. Thomson in 1895, had developed a device for detection of radio waves and demonstrated a range of over half a mile [1]. Marconi, much more the entrepreneur, filed his patent in 1896. Rutherford, later described by Albert Einstein as “a second Newton”, left Cambridge to take up the position of Professor at McGill University in Canada [2]. He returned to Manchester in 1907 and to Cambridge in 1919 to succeed Thomson as director of the Cavendish Laboratory. He received the Nobel Prize for chemistry in 1908.

In Rutherford’s absence, work on wireless at the Cavendish Laboratory had continued. Edward Appleton, later to win a Nobel Prize himself, was pioneering research in radio propagation and others had collaborated with Marconi and worked on the early development of thermionic valves. A group of former Cambridge students had moved to Imperial College to work with valve manufacturer S. R. Mullard on the R5 receiving valve, which was introduced towards the end of the First World War.

Much early wireless research was conducted by enthusiastic amateurs. The Wireless Club of London, now the Radio Society of Great Britain, had been founded in 1913. Amateur radio activity was suspended during the war, but many amateurs had developed their skills in contributing to the war effort. At the end of the war, they returned to universities with increased confidence and ambition. Wireless was the hot new topic of the time. Wireless clubs were springing up all over the country and schoolboys who had been enthused by the new technology were arriving as freshmen in Cambridge. World-famous soprano Dame Nellie Melba made her historic broadcast from a disused packing shed on Marconi’s site in Chelmsford, Essex, on 15 June 1920. It was with this background that CUWS was formed. The Society’s officers soon agreed that “Colonel Stratton and Sir Ernest Rutherford be asked to become Vice-Presidents of the Society”, and that Edward Appleton should be asked to become an honorary member. [3] Astrophysicist Frederick Stratton had helped to introduce wireless to the Cambridge University Officer Training Corps in 1910, and served with distinction in the Royal Corps of Signals during the war.

With an initial subscription of two shillings per term, the Society met monthly to hear members and prominent external speakers present papers on advances in wireless technology. The minutes report an early paper on “Duplex Telephony in Aircraft” and that “the President described a 4 valve receiver of his own manufacture, following which a general discussion took place”. Early external speakers were often from the military, in view of the rapid development that had taken place during the war. Well known wireless pioneers who spoke to early meetings of the Society included Peter Eckersley of the Marconi Company (and later again as chief engineer of the BBC) and Oliver

Lodge. In February 1923, Lodge drew a large crowd at the CUWS for his talk on 'The Roots of Wireless' – for which the vote of thanks was given by Rutherford.

By the late 1920s, formal talks were complemented by informal gatherings to exchange ideas, as electronic hardware became more available and members were engaged in practical equipment development. Virtually all of Appleton's Cavendish students were committee members, as was John Cockcroft, who was another Nobel Prize winner in 1951 for splitting the atomic nucleus.

The Wireless Society eventually gained its transmitting licence in 1932 with the callsign G6UW, which it holds to this day. A dinner was held in 2007 to celebrate the 75<sup>th</sup> anniversary of the callsign, at which the guest of honour was computing pioneer Maurice Wilkes, also a member of the society.

Amateur radio has been responsible for an important part of the training of many radio engineers who are active in industry in a wide variety of roles. In 1920, an aspiring young engineer would likely cite Marconi as their inspiration. Today Elon Musk is often cited as an inspiration by teenagers with an interest in engineering, but it seems to be his electric cars and rockets that inspire rather than the pioneering communications satellite constellations. The first commercial transatlantic wireless communications service was set up by Marconi in 1907 from a peat bog in Galway, Ireland. Today you can stand on that spot in the middle of nowhere, pull a small device out of your pocket and exchange video with almost anywhere in the world. Marconi would be astounded, but we take ubiquitous wireless communications for granted. In spite of that, there are still massive opportunities in future development of wireless communications and Amateur Radio still has an important part to play in developing the skills of engineers. It is especially useful in developing practical experience to complement the unrivalled engineering education available in Cambridge.

Amateur Radio has moved on from the thermionic valves of 1920 and the image of a couple of nattering old fogeys promoted by the 1950s Tony Hancock sketch. Links between Amateur Radio and Nobel prizes continue to this day and Amateur Radio has embraced the era of digital signal processing in a big way. Software running on an ordinary PC can enable reliable global communication at negative signal to noise ratios, thanks to software developed by Joe Taylor, another astrophysicist, Nobel Prize winner and Radio Amateur. Amateurs have pioneered the micro-satellites which will contribute to the future of the internet since UoSAT-1 was launched in 1981. Surrey Satellite Technology Ltd is now a world leading company which has built on the work of Radio Amateurs. There is also now an Amateur Radio station on board the International Space Station.

CUWS still has a part to play in encouraging and developing the skills of young engineers. If you'd like to help to inspire the next generation of wireless engineers, check out the web site of the Radio Communications Foundation [4], which aims to draw talented young people into the industry via the medium of Amateur Radio. Amateur Radio and CUWS can continue to play an important part in the success of UK engineering for the next 100 years.

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