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I.C.T.P., P.O. BOX 586, 34100 TRIESTE, ITALY, CABLE: CENTRATOM TRIESTE



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**COLLEGE ON THEORETICAL AND EXPERIMENTAL RADIOPROPAGATION
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**THE MAIN EVENTS OF ELECTROMAGNETIC WAVE PROPAGATION AND ITS
RELEVANT TECHNOLOGY**

FENG KONGYU

Academia Sinica, Institute of Electronics, Beijing, P.R. China

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The Main Events of Electromagnetic Wave Propagation and Its Relevant Technology

- 1864 J.C. Maxwell presented the paper on his electromagnetic theory to Royal Institution of Great Britain.
- 1870 J. Tyndall showed Royal Institution of Great Britain his experiment in light transmitted along a water column.
- 1880 A.G. Bell published his invention photophone on "Nature". The sunbeam was used as the carrier to transmit the voice signal over 200 metres distance.
- 1887 H. R. Hertz demonstrated the existence of electromagnetic wave by his experiment.
- 1895 Italian G. Marconi succeeded in his experiment transmitting radio over 2.5 Km distance.
- 1897 H.C. Pocklington derived the integral equation for linear antenna and showed that the current distribution on a thin linear antenna is sinusoidal approximately.
- 1901 G. Marconi succeeded in transmitting radio wave from Corn wall to Newfoundland, over the Atlantic Ocean about 3200 Km distance.

The invention of radio was the great advance in the active utilizing of electromagnetic wave of humanity.

- 1901 Max Planck formulated the Planck's radiation law.
- 1902 O. Heaviside and A. E. Kennelly proposed a hypothesis — there is a "conducting layer" reflecting radio waves in the upper atmosphere, to explain the fact that the radio

signal can be received over the Atlantic ocean.

- 1903 C. Hülsmeyer first demonstrated radar as a detector of ships and obtained a patent for his idea in 1904.
- 1906 R. A. Fessenden used 50 KHz generator as transmitter and a microphone inserted in antenna circuit as modulator to broadcast music in Boston, America. It was received by telegraph operator of the ship navigating on the Atlantic ocean.
- 1910 D. Hondros and P. Debye published their theoretical results of electromagnetic waves along long cylinders of dielectric.
- 1919 The first radio station broadcasted talks and music programs regularly in Great Britain.
- 1920 O. Schriever published his experiment in electromagnetic waves transmitting in dielectric wires.
- 1924 The ionosonde was developed and used to measure the height of the ionosphere in Britain and US.
- 1925 E. V. Appleton and G. Breit published the results of their experiments which first conclusively proved the existence of radio-reflecting layers in the upper atmosphere.
- 1926 Watson-Watt named the radio-reflecting layers "ionosphere".
- 1927 British J. L. Baird transmitted picture by telephone line from London to the ship on the Atlantic ocean.
- 1929 British Broadcasting Corporation broadcasted television.
- 1931 S. Chapman proposed the theory of the formation of

the ionosphere.

1932 Appleton-Hartree formula was proposed and theory of the magnetoplasma was systematized.

1933 Nonlinear effect in radio wave propagation, i.e. Luxembourg effect was observed.

1934 U.S. Naval Research Laboratory first used a pulse radar to detect objects.

1936 An air surveillance impulse radar, ranging 40 km and resolution 457 m, was developed in America.

1938 The radar designed by R. A. Watson-Watt was installed at the coast of the English Channel and operated to monitor the German planes in the Second World War.

1946 H.G. Booker and W. Walkinshaw elaborated the theory of guided wave propagation in the troposphere

1950 H.B. Booker and W.E. Gordon published their troposphere scattering theory. It was the beginning of the researches on the problems of wave propagation in the random media.

1952 Wiley developed a radar which he called a "Doppler beam-sharpening" system in America. This is the embryo of synthetic aperture radar.

1954 C.H. Townes first developed Maser in America. The ammonia molecular was used as working substance.

1957 The first satellite was launched in USSR.

1958 American W.E. Gordon advanced a new idea of the incoherent scattering sounding.

1960 T.H. Maiman first developed Laser - pulse ruby laser

in America.

Since then, the application of light spectrum was advanced in a new stage.

1963 The first located synchronous communication satellite was launched into the synchronous orbit in America.

1966 British K.C. Kao and G.A. Hockham proposed that glass fibre with sheath could be used to transmit the light signal.

1972 The first earth resources technology satellite (ERTS) was launched in America.

1978 The first lightwave transmission system was installed and operated in Chicago.

1985 T.T. Wu set up the framework for the investigation of "electromagnetic missile".

