



- *Prof. Hermann Rohling*
- Lecture :

### **Radar History**

James Clerk Maxwell (1831 - 1879) and Heinrich Hertz (1857 - 1894) are the pioneers of radio technology. The first applications covered several wireless communication topics which have been successfully developed by Alexander Stepanovich Popov (1859 - 1906) and Guglielmo Marconi (1874 - 1937). The second important application for the new radio technology was collision avoidance for ship traffic. This idea has been invented by Christian Huelsmeyer (1881 - 1957) who named the technical device as Telemobiloskop in a good European tradition to use Latin or Greek words for technical subjects.

This technique and this invention have been submitted to the "Kaiserliche Patent Office" in Berlin on the 30th of April 1904 just 110 years ago. The cover page of Huelsmeyer's patent shows in a very clear way what the inventor had in his mind. How to avoid any ship collision and how to increase safety in ship traffic scenarios even in bad weather conditions like rain, fog, day and night.

From a scientific point of view it was a big success and a progress in marine applications. Economically however it was not a real success. Nearly 30 years later the Telemobiloskop technology became a large importance in the WWII.

After 1945 the term Radar has been used worldwide. Air Traffic Control (ATC) and Vessel Traffic Control (VTC) became important applications for powerful long range radar systems. Analogue technology was dominating in the radar development labs.

Today we have radar applications in many important ATC and VTC systems. However a big challenge is in the field of automotive radar system with a mass market production in this case.

Forty years ago in 1975 the first digital radar systems came into play. In ATC radar systems the former Moving Target Indicator (MTI) with analogue technology was replaced by the Moving Target Detector (MTD). This was a big step forward in system performance. The MTD system is characterized by a Doppler Filter Bank (DFB), a Ground Clutter Map (GCM) and an adaptive detection procedure based on range Constant False Alarm Rate (CFAR) processors. All three subsystems are typically characterized by digital technology. This was the start of the digital revolution in radar systems.