



Ferraris' demonstration of rotating magnetic fields gets a Milestone

In 1884 when the American Institute of Electrical Engineers, forerunner of the current IEEE, was founded, the industrial revolution driven by electricity was fast developing. One year later in Turin, Italy, Galileo Ferraris, an Italian engineer and a professor of the Italian Industrial Museum (now Polytechnic) of Turin demonstrated the principle of producing a rotating magnetic field (Ferraris' field) by using alternating currents. He also showed experimentally that a conducting cylinder immersed in the rotating field was rotated by it. Both the principle and the experiment are at the origin of the design of ac induction motors and, in general, of ac rotating machines. Also as a consequence of this, the ac electrical technology soon replaced the dc one in electric power engineering.

This fundamental page in the history of electrical technology was the background of the dedication ceremony for Milestone # 212 "Rotating fields and early induction motors, 1885-1888". This Milestone was the 46th Milestone dedicated in Region 8 and the 6th in Italy.

The dedication ceremony took place in Turin, Italy on 21 January 2021, having participants connected at a distance because of the current pandemic.

The ceremony was opened by the Rector of the Turin Polytechnic, which originated in 1906 from the merging of a School of Engineering founded in 1859 with the Italian Industrial Museum. Other opening speeches were given by Susan Kathy Land, IEEE President; Antonio Luque, R8 Director; Bernardo Tellini, Italy Section Chair; Antonio Savini, IEEE History Committee, as well as by Stefano Corgnati and Juan Carlos De Martin, both Vice Rectors of the Turin Polytechnic.

Right after these opening addresses, the the life of Galileo Ferraris was presented by Marco Mezzalama, Emeritus professor of the Turin Polytechnic. Then Paolo Ferraris , past professor of the same Polytechnic, spoke on " The Galileo Ferraris importance for the Electrical Energy utilization through Alternative Currents", followed by Michele Tartaglia, again past professor at the same Polytechnic, who illustrated " Galileo Ferraris the professor and the founder of AEI –Italian Electrical Association". Finally Gerard Capolino,



professor of the University of Picardie, outlined the “Progress in AC electrical machines: from Galileo Ferraris principle to the actual technology”.

The ceremony ended up with the presentation of the Milestone bronze plaque by the IEEE President, who read the citation “ Galileo Ferraris, professor at the Italian Industrial Museum (now Polytechnic) of Turin, conceived and demonstrated the principle of the rotating magnetic field. Ferraris’ field, produced by two stationary coils with perpendicular axes, was driven by alternating currents phase-shifted by 90 degrees. Ferraris also constructed prototypes of two-phase AC motors. Rotating fields, polyphase currents, and their application to induction motors had a fundamental role in the electrification of the world”.

Then our IEEE President, together with Tiziana Tambosso, past President of the Italy Section, unveiled one of three copies of the plaque: two of them will be located in the Turin Polytechnic, in the Department of Energy and in the new Energy Center House respectively, while the third one will be placed in the Ferraris’ house in the village where he was born.

The ceremony was attended at a distance by some 190 participants, including Life members of the IEEE Italy Section.

One can find out more about the dedicated Milestone by visiting the IEEE Global History Network . www.ieeeqhn.org

Antonio Savini

***IEEE History Activity of the IEEE Italy Section chair
and IEEE History Activities Committee, member***