

**THE IMPORTANCE OF AN INITIATOR – THE CASE OF
THE SCHOOL OF SENSORS IN IAȘI, ROMANIA**

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This article is a case study related to the role of ‘founding scientists’ in creating schools and research directions.

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There is a tendency nowadays to overlook, even lessen the value and the role of ‘schools’ and personalities in science. In this brief historical note, we exemplify the importance of a scientific initiator by recalling the development of the research in sensors in Iasi, Romania, a research direction with origins clearly traceable to Dragomir Hurmuzescu and to his works at the end of the 19th century. Even after one century, Hurmuzescu’s contributions are cited and his work highlighted in reviews such as that of Roberto de Andrade Martins, “The rise of magnetochemistry from Ritter to Hurmuzescu” (in *Foundations of Chemistry*, July 2012).

The study of electric and electronic sensors has been established in Iași as a direction of research providing relevant results at international level as early as the last decade of the 19th century, being initiated and oriented by Dragomir Hurmuzescu, corresponding member of the Romanian Academy (“purged out” in the year 1948), professor at the University of Iași since 1896, after having publicly defended a brilliant a PhD thesis in Paris. Among his numerous scientific contributions, Hurmuzescu created an improved variant of coherer (an essentially semiconductor device for electromagnetic wave detection, the equivalent of the present-day diode), as well as

Hurmuzescu electrometer, the most sensitive – at that time – tool for electric charge measurements, utilized by Pierre et Marie Curie in their analyses on radioactivity.

Hurmuzescu developed studies on various issues in magnetism, including topics such as: the electromotive force of magnetisation (Hurmuzescu, D., 1894), (Hurmuzescu, D., 1895); the mechanical, physical, and chemical changes induced by magnetization (Hurmuzescu, D., 1897–1898), (Hurmuzescu, D., 1900), and the connections between the electrostatic and electromagnetic units (Hurmuzescu, D., 1897). He also invented or modernized several devices for measuring magnetization and established a powerful school of magnetism, with numerous followers selected among his students. Among them was Ștefan Procopiu, a direct follower of Hurmuzescu's scientific concerns and directions of interest. To a certain extent, Procopiu had been guided by Hurmuzescu, who obtained for him a scholarship grant in Paris, for concluding his studies in the same laboratory and with the same PhD thesis supervisor as his, namely Gabriel Lippmann, the last disciple of Gustav Kirchhoff, Nobel Prize Winner in 1908. As a young PhD researcher, Procopiu worked as an assistant of Hurmuzescu.

Procopiu's contribution to magnetism is unanimously known. In his turn, he supervised the PhD thesis of Gérard d'Albon, the future professor of the University and, later on, of the Polytechnic Institute of Iași, entitled: "Permeability of thin layers at high frequency and in static measurements." Also, Ștefan Procopiu coordinated the creation in Iași, in 1951, of the Institute of Technical Physics, oriented mainly upon studies of magnetism and magnetic materials.

Starting with the 4th decade of the 20th century (the PhD thesis of D'Albon was defended in the year 1939), large part of the researches developed following the Hurmuzescu-Procopiu line was devoted to sensors based on magnetic materials and magnetic effects, including those manifested in thin layers.

Among the successful, internationally recognized investigations elaborated, in recent decades, in the University of Iași, special mention should be made of those devoted to magnetic sensors, including those using ferrofluids (investigated by I.D. Bursuc, E. Luca, R. Bădescu, O. Baltag, D. Costandache, R. Olaru, N. Rezlescu, Maria Neagu, H. Chiriac, A. Moldovanu, ș.a.), to sensors with electrets (E. Neagu), to sensors with thin layers of liquid crystals (H.N. Teodorescu, M. Cazacu, G. Munteanu *et. al*), to

thin layer semiconducting, polymeric and ferritic sensors for gases (N. Iftimie, E. Rezlescu, P.D. Popa, N. Rezlescu, H. Chiriac, I. Diaconu, D. Dorohoi, R. Grimberg, A. Savin *et al.*), etc.

Recently, joined research teams from the "Petru Poni" Institute of Macromolecular Chemistry and the "Gheorghe Asachi" Technical University of Iași (P. Pascariu, Anton Airinei, N. Olaru, I. Petrila, V. Nica *et al.*) have initiated investigations in new domains, such as that of nano-sensors. Also, studies devoted to the sensors included in clothes ('wearable sensors') were launched at the same Technical University (H.N. Teodorescu, M. Hăgan, D.M. Dobrea *et al.*), to sensors based on chaotic dynamics and to sensors for automobile industries.

Concluding, about six generations of scientists followed the steps of Dragomir Hurmuzescu and benefited from the continuation of the research along a way largely traced by Hurmuzescu.

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