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BORAN LEONTIĆ – *Curriculum Vitae*

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Boran Leontić was born on 3 August 1928 in Split where he finished the Primary School and five grades of the Secondary School (Gymnasium). He continued his education in London, where he graduated from the Secondary School and the first year of Physics and Chemistry at the University of London. In 1951 he obtained his first degree in physics (BSc) at the Department of Physics of the Faculty of Science of the University of Zagreb. He was employed there, but soon he moved to the University of Manchester where he submitted a PhD thesis in 1954. The theme was about cosmic rays and his supervisor was the well-known physicist P.M.S. Blackett. From 1954 to 1957 he was an assistant professor at the Department of Physics at the Faculty of Science in Zagreb. From 1958 till 1963 he stayed at CERN as a researcher, and after this he worked in the USA at the Brookhaven National Laboratory (BNL) in Upton (NY) from 1963 to 1968, as a senior research associate.

Then, in 1968, he returned to Zagreb, because of many good reasons. He immediately became an associate professor at the Department of Physics, Faculty of Science in Zagreb. Simultaneously, he was the principal investigator of the Metal Physics II Department at the Institute of Physics of the University of Zagreb (IFS). In 1970 he was appointed the director of IFS, and the head of Physics Department (Fizički zavod, FZ) at the Department of Physics, Faculty of Science in Zagreb, the positions he held till 1978. In 1971 he was appointed full professor of physics. In 1974 he was awarded, together with E. Babić, the State Award for Science "Ruđer Bošković". In 1975 he was elected associate member of the Croatian Academy of Sciences and Arts, and in 1998 he was appointed Professor Emeritus of the University of Zagreb. He was awarded, in 1999, an Order of "Danica Hrvatska" with the image of Ruđer Bošković, for outstanding contribution to science, and in 2000 he received a State Award for Lifetime Achievement.

It is worth mentioning that Boran Leontić held numerous technical and professional duties which we enumerate: the Board of Condensed Matter Division (Metals) of the European Physics Society (EPS), the military-technical advice to the Ministry of Defence, organizer of 4 (8) international (domestic) scientific meetings, head of 4 (5) international (domestic) projects and he served as a referee of numerous books, textbooks, projects *etc*.

In his early days in Manchester, CERN and BNL (1951–1968) his scientific and technical interests were exclusively in the high energy physics. These included interactions of cosmic rays (CR) with matter, lepton (muon) weak interactions, a number of original solutions for measurements and evaluation procedures. While at CERN, he published some results of special significance which confirmed and helped to understand the non-conservation of parity (Lee and Yang). Measurements of the angular asymmetry in the muon decay helped to confirm the new model of weak interactions and he also helped to develop the Spectroscopy of strange particles.

At Brookhaven National Laboratory (BNL) he pursued the development of new research methods used to observe particle resonances (the results helped to provide the confirmation of SU(3) symmetry). This involved him in the pioneering high-precision measurements of the cross sections of π, and K-mesons in hydrogen and deuterium in a broad interval of momenta. (One of the papers received more than 550 citations). In just 2 years he and his group discovered 13 hyperon resonances. He was also closely involved in the pioneering experiment in search for massive bosons. Furthermore, in an ambitious endeavour to measure the magnetic moment of Ξ-particles ($-2.2 \pm 0.8\ m_n$) he designed the strongest superconducting magnet of 13 T. He developed a number of interesting methods for the detection of ionizing particles (especially with Čerenkov radiation) and constructed a hyper-chromatic optical device to focus accurately Čerenkov light. Leontić's innovations resulted in 5 patents, during his stay in USA, and he was a consultant to several companies and agencies, including NASA.

A great switch occurred in 1968, when Boran Leontić returned to Zagreb and began an entirely new activity in condensed matter physics, in which he successfully remained until the present days. Together with his collaborators, he developed various measurement procedures and innovations such as the method of continuous rapid solidification (Rapid quenching, RQ) and pursued the construction of equipment for the production of first ribbons of amorphous metals by RQ, which led to the discovery of localised spin fluctuations (LSF) in these alloys. He was a co-organizer (with M. Paić and A. Bonefačić) of the First International Conference on RQ in Brela (1969). Since 1986, he has done research on high-temperature superconductors and transport properties of amorphous and disordered systems.

He also incessantly pursued the selection of contemporary topics of research (Kondo effect, transport properties of amorphous metals, high temperature superconductors *etc*.), and education of young associates. Following the First International Conference on RQ, he and his team of researchers obtained interesting novel results, such as the enhancement of superconductivity in Al-Cu alloys, and, later, the increased solubility of 3d metals in Al and Zn, which revealed the effect of local spin fluctuations (LSF) on the resistivity of Al-Mn alloys (which was the main reason for the "Ruđer Bošković" Award 1974). Further evolution of ultrafast quenching procedures on amorphous metals was the main theme of the Gordon Conference 1976 of which B. Leontić was a co-organizer. He also organised, together with his colleagues, the 1st EPS conference on the phonon contribution to electron resistance of alloys at $T \ll T_{Debye}$ temperature in Cavtat, 1977. Around 1980, he introduced a novel method to study the electronic structure and chemical short-range order in amorphous early-late transition-metal alloys by using absorbed hydrogen (p) as an atomic probe. This hydrogen doping was later successfully combined with the study of quantum corrections to the electrical resistance and the magnetic susceptibility in similar systems. Then, in 1986, the high-temperature superconductors appeared on the scientific scene and Boran Leontić was among the first who synthesized $GdBa_2Cu_3O_{7-x}$ with $T_c = 94$ K. Together with his colleagues he devised computer-controlled production of monocrystals of Bi-Sr-Ca-Cu-O (Bi2212). With the help of magnetoresistance and the Hall effect, he and his colleagues obtained outstanding results on the state of vortices and atomic modulations in the Bi2212 system. Soon after the discovery (2001) of a new superconductor MgB_2, he synthesized it and participated in studying the influence of doping on its T_c (strong influence of carbon).

In the course of his scientific and technical activity Boran Leontić published 192 scientific papers of which 112 were listed in Current Contents, and all those were cited about 2000 times. He published 13 papers in *Physical Review Letters*, 15 in *Physical Review*, *etc*. He delivered 10 invited lectures at scientific conferences and seminars in many scientific institutions.

Boran Leontić had a remarkable career in teaching. Immediately upon arrival in Zagreb in 1968 he modernized the Physics Department (FZ). He introduced several new undergraduate courses, like low-temperature physics and similar subjects. In this way he participated in modernizing the curriculum of physics. Professor Leontić supervised 50 diploma theses. At the doctoral studies in the solid state physics, he introduced the course "Physics of ceramics and polymers". He supervised 22 Master of Science theses and 15 PhD theses. He helped educate more then 10 distinguished scientists and about 2000 graduates. In addition, he established a group of scientists in Sarajevo at the Faculty of Natural Sciences and Mathematics.

His restless brain follows with great interest all of the new discoveries in condensed-matter physics and other fields of sciences. What I personally appreciated the most is his suggestion to read the journal *Scientific American* frequently in order to grasp the knowledge in many fields of sciences of highest interest for the modern mankind. For this and many other suggestions we are all deeply thankful to this great man.

Goran Pichler