

Omar Mukbaniani¹ and Gennady Zaikov²PROFESSOR JIMSHER ANELI.
MORE THAN HALF A CENTURY IN SCIENCE¹Ivane Javakhishvili Tbilisi State University,

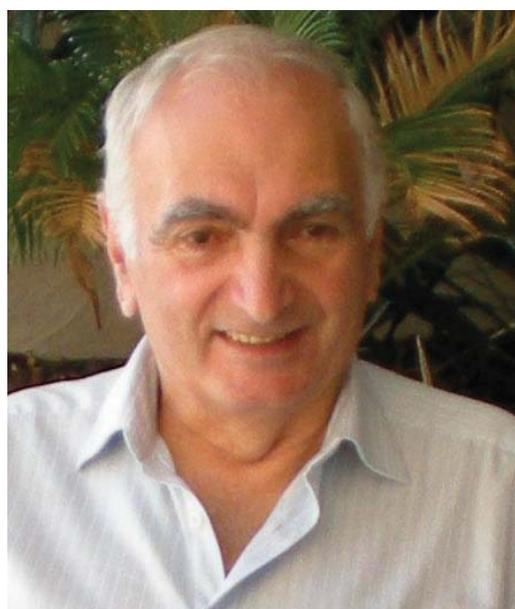
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Prof. J. Aneli was born on April 20, 1935 in Tbilisi (capital of Georgia) in the family of biologist Prof. N. Aneli, who instilled in his son love for nature and natural sciences. After finishing a secondary school in 1953 J. Aneli entered physics department of Tbilisi State University. After successful graduation from the University in 1958 J. Aneli was directed to Physical Institute of Georgian Academy of Sciences where he started displaying a great interest for study of the electrical and magnetic properties of solid organic materials. Soon J. Aneli became a post graduate student of Institute of Elementorganic compounds of Russian Academy of Sciences (Moscow). Under guidance of the well-known scientist Alexander Kitaigorodski J. Aneli was deeply involved in the study on the electrical and magnetic properties of the molecular crystals and polymers with contemporary analytical methods. The results of this study were used by the author in his Ph.D. thesis: "Influence of some physical factors on the paramagnetic centers in the molecular crystals and polymers".

Further scientific activity of Prof. J. Aneli was closely connected with study of polymers, primarily polymer composites. The main direction of his scientific work was investigation of conducting properties of polymers filled by conductive grainy and fibrous materials (carbon black, graphite, metal nano-powders). The scientist understood that discovery of the charge transport nature of conducting composite materials will boost development of science and technology. Therefore, the leitmotif of J. Aneli's works was the search of conducting polymer composites (CPC) mechanism. Own critical analysis and conductivity models of other specialists lead the author to the conclusion that it is not only filler concentration that defines the conductivity of CPC. Relation between the three types of interactions energy – polymer-polymer, polymer-filler, and filler-filler – play a decisive role in definition of conductivity value of composites. J. Aneli with collaborators has shown experimentally that CPC is characterized by maximum



conductivity in which these interactions are equal one to another. This concept was the basis of D.Sc. thesis of J. Aneli "Effect of technological and physical factors on conductivity of polymer composites" (1995). The original works and results of other authors' works were generalized in the monograph "Structuring and conductivity of polymer composites" published in New-York in 1998 (authors: J. Aneli, L. Khananashvili, G. Zaikov).

Prof. J. Aneli has discovered some regulations by which the CPC are characterized. Thus it was established that some silicon elastomers with flexible chains filled by carbon materials display relay effect – reversible sharp change by several orders of CPC conductivity value at definite temperatures and pressures. This phenomenon is explained as sharp change of conducting set in the result of transfer in molecular system of bundle–spiral type. The author has obtained some regulations explaining peculiarities of "smart" polymers. Probably, for the first time Prof. J. Aneli obtained dependences of the short

electromagnetic waves absorption by CPC on the homogeneity of conductive fillers distribution in the polymer matrix – increasing of absorption at increasing of homogeneity. Stage pyrolysis method of new semiconductor production on the basis of some polymer composites elaborated by Prof. J. Aneli allows to manufacture semiconductors with desirable properties. High temperature superconductor – CPC based on some polymers and $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ obtained by J. Aneli differs from others by high mechanical properties and durability.

The results of scientific works of Prof. J. Aneli were applied in different branches of technology (*e.g.* high sensitive tensometers, precise shunts for measuring of

high level current pulses in charge accelerators, *etc.*). Several devices and electrical engineering materials elaborated by Prof. J. Aneli on the basis of new CPC were demonstrated at international exhibitions and fairs in different cities of the world (Barcelona, Beograd, Dresden, Izmir, and Moscow). Many of these exhibits were awarded by medals and diplomas.

Prof. J. Aneli successfully combines his scientific and pedagogical work. He is professor of Georgian Technical University.

J. Aneli displays inquisitiveness in everything and is interested in all novelties. One of his hobbies is water-color painting.