RACE FOR A HIGHER QUALITY OF THE SCIENTIFIC INFORMATION: A 60 YEARS (1957-2017) RETROSPECT OF THE MAIN PERSONAL CONCERNS AND STUDIES II. YEARS (FALL 1992 - 2017) OF ACTIVITY SYNTHESIS

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This work presents a brief review of the main results obtained by author during the years 1992-2017, in the field of Information Science, in cooperation with: a) the Departments of: (i) Physics of the Politecnico di Torino (concerning mainly the numerical phenomena intervening in the complex simulations on computers), (ii) Physics of the Portland State University from Oregon (relative to the information technologies based on the intelligent devices – CCDs), (iii) Information Science and Physics, respectively, of the University "Politehnica" of Bucharest (teaching of several Master courses in the field of the Information Science), b) section of Information Science and Technology of the Academy of Romanian Scientists. Finally, this paper presents a synthesis of the author's main scientific and didactic results obtained during his 60 years of activity (1957-2017).

Key words: Information Science, Complexity Theory, Syntactic Structures

6. Fall 1992 - Spring 2001: First International scientific apprenticeship at Prof. Delsanto's research group from Dipartimento di Fisica, Politecnico di Torino; <u>Battle (Fight) for a higher accuracy of Computer Simulations</u>

The advantages of the computer simulations of some intricate physical materials or processes are well-known [1], but … given being it is generally required a high accuracy of the scientific information, the computer simulations have to lead also to very accurate results. Or, when I began my apprenticeship in the frame of Professor Delsanto's research group, besides many other scientific goals, the fellows of this research group were concerned by certain distortions affecting the Finite Differences (FD) simulations both of the: a) diffusion and drift processes [2] (see e.g. figs. 1 and 2, as well as the reference [23a] of the first part of this work), and those of the: b) waves propagation in various media[3] (ref. [23b] of the first part of this work): as the instabilities − fig. 3, the pseudo-convergence − fig. 4 and the opposite distortion following immediately the simulated pulse [3] (see also fig. 5). Together with Prof. Delsanto and his main Italian collaborators − Drs. Marco Scalerandi, Giorgios Kaniadakis and Enrica Ruffino, we (myself and dr. Eng. Cristina Iordache) succeeded to explain [4], [5] and [6] the numerical phenomena presented by Figs. 1, 2, 3 and 4.

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[3]These simulations were intended to different applications in the field of non-destructive examinations and testing (NDE/NDT).