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**This issue is dedicated to the occasion of Prof. Tharwat M. El-Sherbini's
80th birthday**



Professor Tharwat El-Sherbini is the Editor-in- Chief of the Egyptian Journal of Physics, since 2002. Born in Cairo on 18 December 1942, he moved with his family to Alexandria in 1946 when his father, Professor Mahmoud El-Sherbini, left Cairo University (Fouad I University at the time) and was appointed the first head of the newly established physics department at the faculty of science of Alexandria University (Farouk I University). After graduating from the faculty of engineering (electrical engineering department) in 1964, he started his scientific career by joining the X-ray unit at the National Research Centre in Cairo. At this unit he was engaged in X-ray crystallographic studies of some Egyptian minerals and their uses in electrical resistors and capacitors. This work led to the M.Sc. degree from the faculty of engineering of Alexandria University in 1967. Soon afterwards, he obtained a scholarship to continue his graduate studies at the FOM Institute of Atomic and Molecular Physics in Amsterdam. This institute was one of the leading scientific centers in the field of atomic, molecular and laser physics in the world. His scientific work at the FOM Institute involved experimental studies on electron- atom and molecule collisions and resulted in a Ph. D. degree from Leiden University in 1972. The work was under the guidance of the director of the institute, the well-known Professor of Atomic Physics, J. Kistemaker. In July 1972 he returned to Egypt and became a staff member of the physics department of the faculty of science – Cairo University. In 1982, he became a Professor of Atomic Physics, and since then his job at Cairo University has been divided between research work and tutorial duties. In 1972, he started to introduce subjects of laser physics and non-linear optics in the courses for undergraduate and graduate students in the fields of atomic, molecular and laser physics. He was primarily engaged with experimental atomic and molecular collision research using the mass spectrometric facilities at the physics department and at the same time with atomic and molecular structure calculations. The research work carried out in that period resulted in

Prof. El-Sherbini being awarded a Doctor of Science (D. Sc.) degree in Atomic Physics in 1984. The renowned Professor M. J. Seaton (FRS), Professor of Atomic Physics and the head of the department of Physics and Astrophysics at the University College London, on the occasion of the award of the D. Sc. degree said: I am very favourably impressed by the work presented in the thesis. Many research workers in Atomic Physics do only experimental or only theoretical research, Dr. Tharwat El-Sherbini has to be congratulated on doing both.

In 1981 he was offered by Professor Abdus Salam, the director of the “International Centre For Theoretical Physics” (ICTP) in Trieste, Italy, and the Nobel Laureate in Physics 1979, to be appointed as Associate Member of the Centre for six years, which was renewed for another six years in 1987. In 1993, he was invited to become a Senior Associate of the Abdus Salam International Centre For Theoretical Physics. In 1988 the ICTP offered him a financial donation in order to enable him to organize and direct the “**International Conference on Atomic and Molecular Processes in Controlled Thermonuclear Fusion Research**” in Cairo. The aim of the conference was to give an overview of the role played by atomic and molecular physics in the development of controlled thermonuclear fusion reactors as long term energy sources.

In 2000, he established one of the best research laboratories in Egypt in the field of Lasers and New Materials (LLNM). In this laboratory about 40 research students were working for their M. Sc. and Ph. D. theses from various universities and research institutes in Egypt and other Arab countries and conducted their research work. In 2006, the LLNM laboratory at Cairo University, amidst many other international entries, was selected by the International Atomic Energy Agency (IAEA) and the Central European Initiative (CEI), together with the ICTP, to host the 2006 International Host Laboratory Experiments and Workshop on “**Joint Experiments on X-ray/Particle Emission from Plasmas Produced by Laser Irradiated Nano-Structured Targets**” AIP Conference Proceedings 996 (2008) 243 <https://doi.org/10.1063/1.2917018> . The laboratory was selected on the basis of the excellent research and training facilities offered, especially for scientists from developing countries in the field of Plasma Physics and Nanotechnology. The ICTP allotted an amount up to thirty thousand Euros to provide financial support for the experiment and the workshop. In the workshop a group of approximately 38 scientists (13 from developed countries and 25 from developing countries) exchanged scientific ideas and discussed their research problems in the fields of plasma physics and nanotechnology.

Professor El-Sherbini’s efforts were not restricted only to the improvement of the level of scientific research in Egypt. They were also concerned with the development of university education in general, in order that it may comply with international standards. In this direction he proposed, in cooperation with Professor A. Nossair, the vice president of Al Azhar University, a National Project to the Joint European Project (JEP) Commission under the title “**Curriculum Development of Electronic Courses for Physicists**”. This project provided undergraduate as well as graduate students of basic and computer sciences with modern courses on electronics through CD’s and E-learning. In line with national efforts, this project aimed at improving the quality of education in order that market requirements are met and job opportunities for scientists are increased.

Professor El-Sherbini was elected a member of the American Physical Society (APS) and a Fellow of the Institute of Physics in the UK (FInstP) in 2011. He has been the leader of the Atomic Physics Group at Cairo University for more than forty years. Over the course of the past four decades, Prof. El-Sherbini has published more than 160 articles in the fields of Atomic, Molecular and Laser Physics, and supervised

more than 90 theses in these fields. In 2015, he wrote a review article summarizing the research work and the activities of his group during this period under the title **“Advances in Atomic Physics: Four Decades of Contribution of the Cairo University – Atomic Physics Group”**, in the Journal of Advanced Research vol. 6 (2015) 643 – 661 <https://doi.org/10.1016/j.jare.2013.08.004> . This review was highlighted by the international atomic physics society, and throughout the scientific community it was widely appreciated. Due to the fact that the article was well received, on request it was followed by another review article on the contribution of Prof. El-Sherbini’s research laboratory (LLNM) at Cairo University to the field of Medical Physics. This review was published in the Journal of Medical Physics and Applied Sciences in 2016, under the title **“Impact of Physics on Medical Sciences and Applications: Lasers and Nanotechnology”**, vol. 1 No.1 (2016) 1 – 15 <https://www.scholarscentral.com/abstract/impact-of-physics-on-medical-sciences-and-applications-laser-and-nanotechnology-110928.html>. Professor El-Sherbini’s research interests reach beyond Atomic Physics and cover other disciplines of Physics as well. In a recent publication he proposes a novel approach to very early cosmology based on the introduction of a hypothesized new particle, which he refers to as the *s- particle*. According to the model, this particle via two geometrical phase transitions in space-time, leads to the formation of the known fundamental particles including dark matter. In addition, the proposed primordial *s- particle* may provide a novel model allowing for gravitational force to be accommodated into the same structural framework as the three other fundamental forces, something that on the basis of field theories could not yet be solved. Moreover, in this model the electric charge and the masses of the fundamental particles are shown to be generated in connection with the *s- particle* via geometrical approach. The article was published in the Journal of High Energy Physics, Gravitation and Cosmology (JHEPGC) in 2022, under the title **“A Cosmological Model for the Early Universe: The Formation of Fundamental Particles”**, vol. 8 No.4 (2022) 1073 – 1083 <https://doi.org/10.4236/jhepgc.2022.84075> ; <https://www.scirp.org/journal/jhepgc> .

In 2002 Professor El-Sherbini was elected President of the Egyptian Physical Society (2002 – 2020) and Editor in Chief of the Egyptian Journal of Physics (2002 -). Over the years since 1976, he has received several awards and honours, among which: The “NILE” Award 2010, which is the highest award in sciences, bestowed by the Egyptian State; The Cairo University Award for Scientific Distinction 2008; The State Appreciation Award in Advanced Technological Sciences 2006; The Cairo University Scientific Appreciation Award 2003; The State Scientific Creativity Award 2002; The Kuwait Foundation for the Advancement of Sciences Award for Scientific Excellence in the Arab World 1982; The State Incentive Award in Physics 1976; The First Grade National Decoration of Arts and Sciences twice, in 1977 and 2012; He was honored by his appointment as, President of the Highest Scientific Committee in Egypt to offer the Egyptian State Awards in 2013, by the Egyptian Ministry of Scientific Research.

The present issue of our journal will be dedicated to the remarkable person of Prof. Tharwat M. El-Sherbini, in celebration and acknowledgement of his major contributions in the field of physics both within Egypt and internationally.