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Education:

- **BSc** with honors in physics, Helwan University, Cairo, Egypt.
- **MSc** in theoretical Nuclear physics, Helwan University, Cairo, Egypt. Thesis Title: *Study of heavy ion collisions at intermediate energies*.
- **PhD** in theoretical physics and applied mathematics, Queen Mary College, University of London, UK (graduation date: 31 December, 2009).
 - **Thesis Topic:** Some applications of chaotically quantized coupled map lattices (CML) in particle physics and cosmology.
 - **Thesis Title:** Dynamics of Chaotic String Fields.
 - **Supervisor:** Professor [Christian Beck](#).

Current Research Interests:

- *Using a particular class of coupled map lattices (CMLs), Cellular Automata (CA) and Neural networks (NN) I am working on*
 - Simulating vacuum fluctuations.
 - Building a preliminary cosmic inflationary scenario.
 - Exploring the role of dimensionality in physics.
 - Calculation of the mass spectrum of fermions using the principle of vacuum energy minimization with high precision.
 - Fixing some running coupling constants of the standard model of particle physics (SM).
 - Predicting the mass of some of the lightest superpartners.
 - Seeking clues and to possible fermion compositeness.

- *Future project is being established in collaboration with [Arno Bohm](#) towards exploring possible stochastic/dynamical origins of the time asymmetric quantum theory, quantum jumps, and quantum decoherence.*

Research Areas of Interest:

- Complexity science as related and applied to cosmology, particle physics, fundamental physics and quantum gravity.
- Discrete approaches to quantum gravity, particularly those that have dynamical relevance or dynamical origin.
- Possible geometrical, dynamical, and/or statistical origins of fundamental physics, particularly quantum physics.

Recent Publications:

- Chaotic quantization and the mass spectrum of fermions (with C. Beck), *Chaos, Solitons and Fractals* 37, 9 (2008).

Teaching Experience:

- ***During my MSc Study***, I did tutorial work and laboratory demonstration in engineering physics (electromagnetism, heat transfer, thermodynamics acoustics, waves, sound and properties of matter), radiation physics, modern physics, modern electronics and laser optics.
- ***During my PhD study***, I did tutorial work for the course ‘[Essential Mathematics](#)’ given to the first year math students in the school of mathematical sciences, Queen Mary College, University of London in 2006-08. I did also one semester tutorial for the course “[Chaos and Fractals](#)” for the 3rd year math students in autumn 2006. I did one semester tutorials for the course ‘[Quantum Mechanics A](#)’ in spring 2007 and one semester tutorials for the course ‘[Quantum Mechanics B](#)’ in spring 2008 for the physics with particle physics majors in physics department, Queen Mary College, University of London.

- **After finishing my PhD project**, I taught courses ranging from [Quantum Mechanics \(II\)](#) for senior physics undergraduates to [Heat and thermal physics](#) for engineering freshmen in the faculty of science, Helwan University.

Conferences and workshops attended:

- The very early Universe 25 years on. 17-25 December 2007. Center for theoretical cosmology, DAMTP, University of Cambridge.
- PASCOS-07. The 13th international symposium on Particles, Strings and Cosmology. 2-7 July 2007. Imperial College London.
- Outstanding questions for the standard cosmological model. An international conference. Imperial College London, March 26-29, 2007.
- Einstein centennial symposium, Bibliotheca Alexandrina, Alexandria, Egypt, 2005.
- International conference on Mathematics, Nuclear physics and Applications in the 21st century (Cairo, March 8 - 13, 2003).
- Workshop on High energy physics, Cairo University (October 2002).