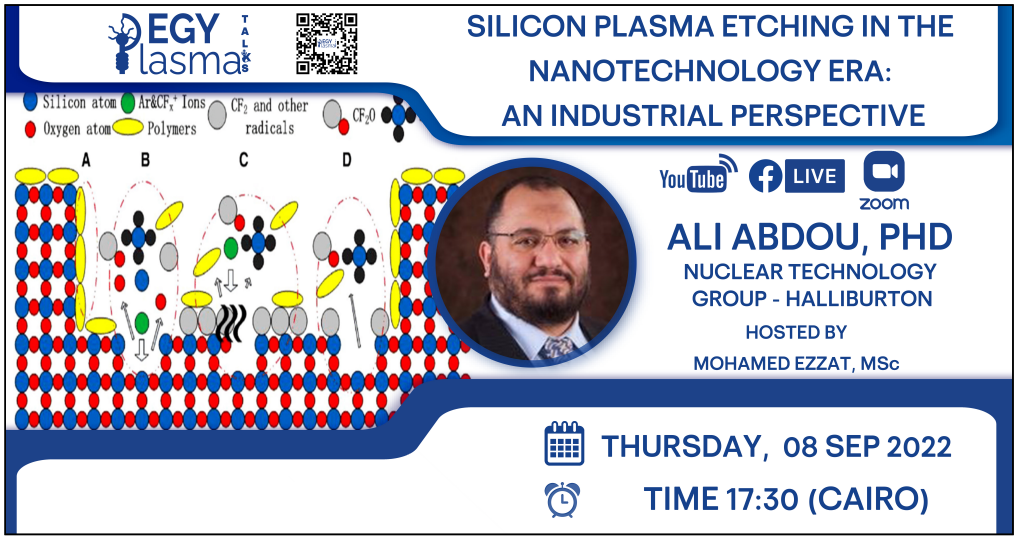

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Title: Silicon Plasma Etching in the Nanotechnology Era: An Industrial Perspective

Speaker: Prof. Ali Abdou (Nuclear Technology Group - Halliburton, USA)

When: 2022-09-08 17:30:00 - **Hosted by**: Mohamed Ezzat, MSc

Abstract: Nanotechnology is a revolutionary engine that will engender enormous changes in a vast majority of today's industries and markets, while potentially creating completely new industries. The impact of nanotechnology is particularly significant in the electronics industry, which is constantly driven by the need for higher performance, increased functionality, smaller size and lower cost. Historically, CMOS scaling has provided the means to realize higher performance increased functionality, smaller size and lower cost. Scaling of CMOS technology continues in spite of tremendous technology development barriers, design challenges and prohibitive costs. Soon, the 22nm CMOS technology node is moving from development to high volume manufacturing while research and development continues on future technology nodes including 16nm, 11nm and beyond. Fabrication of Integrated-Circuits (IC) in these scaled technologies faces new challenges and limitations. Since its introduction in the 1970s, plasma etching has become an integral part of semiconductor IC fabrication. Driven by relentless pursuit of Moor’s law, plasma etching advances at a rate never seen before in the history of this processing technology since its introduction to the IC industry. Challenges in plasma etching are still coming from CMOS device fabrication. Increased complexity in plasma etching for silicon nanoelectronics applications: introduction of multiple new materials, typical dimensions are less than few ten’s of nanometers, large size wafers. Transistor gate dimension must be controlled with a precision in the few nanometers range. In this presentation, we will outline the plasma etching technology requirements in the nanotechnology era from an industrial perspective.

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