Physics Colloquium

Thursday, April 21st at 3:30 pm in SC 234

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Processing of semiconductors with photon and ion beams or what can a physicist do to have fun and also pay his bills

Progress in silicon technology over the last five decades, conveniently described by Moore's law, revolutionized the world we live in. In this presentation I will give some examples from the projects that I was involved in, in order to show how modification of materials' properties with energetic ions and/or with intense photon beams provided the means for improving Si-based devices. Two early examples include "laser annealing" of ion-implanted silicon, an approach that elucidated rapid solidification and crystal growth but did not lead to practical applications until much later; and rapid thermal processing, which became an essential step in device processing almost immediately. Then I will discuss the main methods of forming silicon-on-insulator (SOI) substrates, and show how this has led to better performing transistors, and also to silicon photonics and MEMS (microelectromechanical systems). Ion-beam assisted exfoliation of 4H-SiC is a recent extension of the SOI concept. I will conclude with a few remarks on being an industrial physicist.

Refreshments 3:00-3:20 pm in SC 103