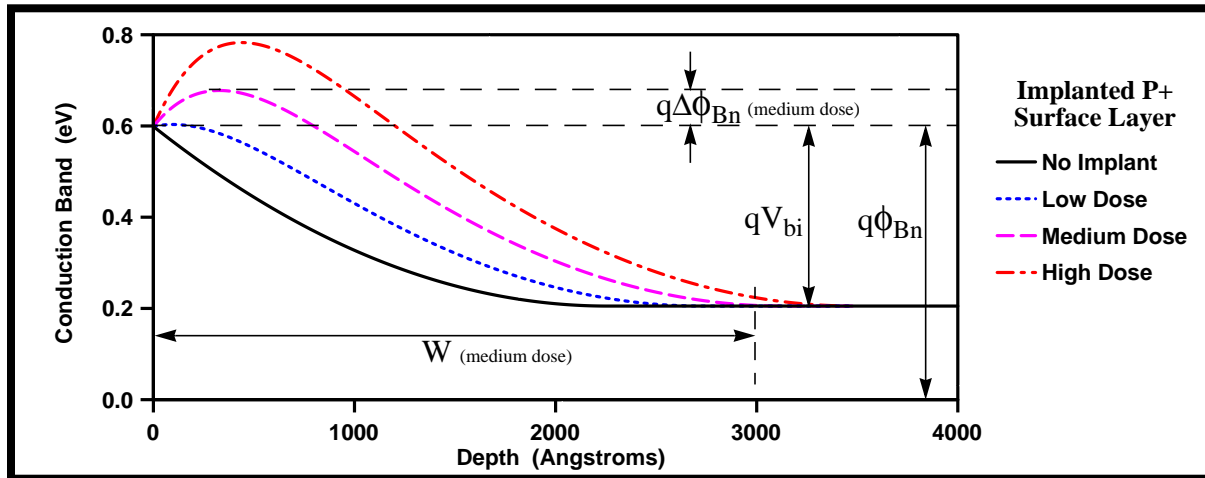


# Fairchild Semiconductor: Process Integration Team

## Schottky diode adjustment via ion implantation. Summer 1998



Reducing the reverse bias leakage current of Fairchild Semiconductor's, FS50 Schottky diodes was my main task during this internship. But first, I drew device cross-sections for a training manual describing Fairchild's, new, 0.5  $\mu\text{m}$ , BiCMOS, fabrication process flow (FS50). With a good grasp of the FS50 process, the rest of my summer was spent focused on using ion implantation to increase the barrier height and to lower the series resistance of N-type Schottky diodes. Following a literature survey, I derived an analytical model for Schottky barrier height augmentation via a thin P+ surface layer. Using TSUPREM-4 and MEDICI, I modeled the fabrication and performance of Schottky diodes with various ion implants. Adjusted Schottky diodes were then fabricated and characterized. Finally, I presented this modeling work and some promising, preliminary, experimental results in a departmental presentation and a final technical report: "Schottky Diode Adjustment Via Ion Implantation."

