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Revolutionizing Computing Speed: Improved Light Detection Materials for Data Processing

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The size, cost, and processing speed of computers can be improved by improving the optical properties of Silicon (Si). Combining other elements with Si results in changes in its chemical properties leading to significant improvement in the light absorption of Si. The challenge which we tackled is finding the right synthetic tool to mix the right amount of silicon, germanium (Ge) and tin (Sn) to yield the desired optical properties. SiGeSn materials were produced by simultaneously implanting Ge and Sn ions into Si, using the Tandetron Accelerator Ion Implanter. Samples with different quantities of Si, Ge, and Sn were studied for their structural, chemical, and light absorption properties. We improved light absorption properties of Si by a factor of 10000 for our new SiGeSn materials. This is important because high-speed computers can be created using these improved light absorbing materials. Giving us affordable computers that can complete multiple tasks faster.