Russian Scientists Make Groundbreaking Semiconductor Discovery – December 8, 2023

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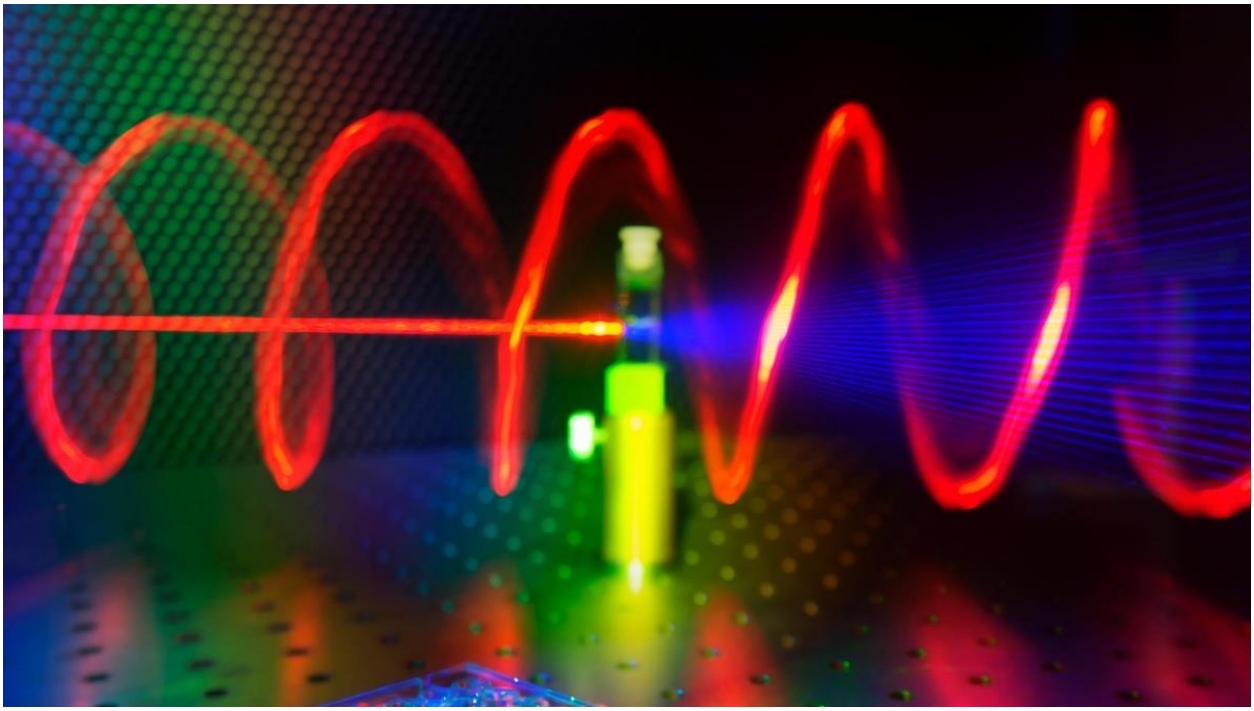

Russian researchers have made a groundbreaking discovery in the field of semiconductors, a critical component in a wide array of electronic devices, offering a potential new path for technological advancement. The discovery could lead to improvements in semiconductor technology's efficiency, performance, and potentially open doors to new functionalities in electronic devices.

Revisiting Wiedemann-Franz Law

The researchers from the Department of Energy's SLAC National Accelerator Laboratory, Stanford University, and the University of Illinois suggested that the 170-year-old Wiedemann-Franz law could still

be applicable to one type of quantum material: the copper oxide superconductors. The theory suggests that if only the electrons in cuprates are considered, other factors like vibrations in the material's atomic latticework must account for experimental results that make it seem like the law doesn't apply. This finding is crucial for understanding unconventional superconductors and other quantum materials.

Innovation in Measuring Systems

The article also highlights the development of an automated information measuring system for assessing the capacitance voltage characteristics of semiconductor structures. This system allows the characteristics of semiconductor structures to be measured and processed to determine the electrophysical parameters by an indirect method.

Advancements in Material Science

The researchers also explored the modification of photocathodes based on copper(I) oxide (COPC) by coating with ZnO nanoparticles or graphene oxide (GO) with different compositions and morphologies. The influence of the composition and morphology of graphene oxide on the photocatalytic activity and stability of COPC has been established, providing higher photocathode stability required in photocatalytic water splitting.

Another notable advancement is the introduction of the EVG®850 NanoCleaveTM layer release system by EV Group. This system enables nanometer-precision release of bonded, deposited, or grown layers from silicon carrier substrates using an infrared (IR) laser coupled with specially formulated inorganic release materials. This system eliminates the need for glass carriers, enabling ultra-thin chiplet stacking for advanced packaging and ultra-thin 3D layer stacking for front-end processing.

The Russian scientists' discovery is a significant stepping stone in the field of material science and could have a substantial impact on future technological innovations.

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