



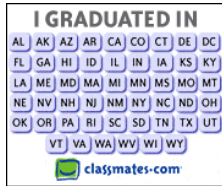
# Computing

## How LED displays are changing

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WASHINGTON: You may soon get to enjoy facilities like flexible high-resolution home theatre displays, wearable health monitors, and biomedical imaging devices because scientists are working on a novel process for creating new classes of lighting and display systems.



John Rogers, the Flory-Founder Chair Professor of Materials Science and Engineering at the University of Illinois, has revealed that the new process is all about creating and assembling ultra-thin, ultra-small inorganic light-emitting diodes (LEDs) into large arrays that offer new classes of lighting and display systems with interesting properties, such as see-through construction and mechanical flexibility.

He said that such properties would be impossible to achieve with existing technologies. "Our goal is to marry

some of the advantages of inorganic LED technology with the scalability, ease of processing and resolution of organic LEDs," said Rogers.

Compared to their organic counterparts, inorganic LEDs are brighter, more robust and longer-lived. Organic LEDs, however, are attractive because they can be formed on flexible substrates, in dense, interconnected arrays.

Rogers and his colleagues-including collaborators from Northwestern University, the Institute of High Performance Computing in Singapore, and Tsinghua University in Beijing-say that the new technology combines features of both.

"By printing large arrays of ultra-thin, ultra-small inorganic LEDs and interconnecting them using thin-film processing, we can create general lighting and high-resolution display systems that otherwise could not be built with the conventional ways that inorganic LEDs are made, manipulated and assembled," Rogers said.

To overcome requirements on device size and thickness associated with conventional wafer dicing, packaging and wire bonding methods, the researchers have developed epitaxial growth techniques for creating LEDs with sizes up to 100 times smaller than usual.

They have also developed printing processes for assembling these devices into arrays on stiff, flexible, and stretchable substrates.

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