New type of liquid crystal identified; Holds promise of faster, lower priced liquid crystal displays

June 17 2004

A new type of liquid crystal - recently discovered by a research team that includes a Kent State University professor - holds the promise of **faster liquid crystal displays at a lower price**.

A new liquid crystal phase – the biaxial nematic liquid crystal - which is likely to revolutionize the liquid crystal display technology, has been discovered by three researchers, Dr. Satyendra Kumar, professor of physics at Kent State; Dr. Bharat R. Acharya, of Platytus Technologies, Madison, WI; and Dr. Andrew Primak, of Pacific Northwest National Lab, Richland, WA.

Currently, the liquid crystal displays used in most laptops and televisions make use of the uniaxial nematic liquid crystal. It is predicted that the use of biaxial nematic liquid crystals will make these products more than 10 times faster and will allow for cost-saving measures.

The existence of the biaxial nematic liquid crystal was predicted 34 years ago by IBM's Thomas J. Watson Research Center in Yorktown Heights, N.Y.

However, according to Acharya, "There was no evidence of the existence of biaxial nematic liquid crystals made of single molecules until recently. Other types of more complex micellar biaxial liquid crystals were found previously by Kent State researchers, but, until now,

none had the right optical properties for use in displays and photonics devices."

A paper reporting how the researchers used small-angle X-ray diffraction technique to discover the biaxial nematic liquid crystal appeared in the April 9 issue of the prestigious Physical Review Letters. Kent State researchers also presented their initial evidence in 2000 at the March meeting of the American Physical Society. This research will be presented by Kumar in an invited talk at the International Liquid Crystal Conference in Slovenia on July 6, 2004.

Source: Kent State University