Electrofluidic Display Technology puts electronic book readers ahead by a wide margin

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The pixel structure is able to reveal or hide the pigments with high contrast and video speed. The reservoir (center circle) holds the pigment until it is ready to be displayed by application of voltage. Photo credit: Gamma Dynamics LLC

(PhysOrg.com) -- Thinking about getting an e-reader but not sure if you like reading the dim screen? An international collaboration of the University of Cincinnati, Sun Chemical, Polymer Vision and Gamma Dynamics has announced Electrofluidic Display Technology (EFD), the first technology to electrically switch the appearance of pigments in a manner that provides visual brilliance equal to conventional printed media.

This new entry into the race for full-color electronic paper can potentially provide better than 85 percent “white-state reflectance,” a performance level required for consumers to accept reflective display applications such as e-books, cell-phones and signage.

The study is described in the May issue of "Nature Photonics."

“If you compare this technology to what’s been developed previously, there’s no comparison,” says developer Jason Heikenfeld, assistant professor of electrical engineering in UC's College of Engineering. “We’re ahead by a wide margin in critical categories such as brightness, color saturation and video speed.”

This work, which has been underway for several years, has just been published in the paper “Electrofluidic displays using Young-Laplace transposition of brilliant pigment dispersions.”

Lead author Heikenfeld explains the primary advantage of the approach.

“The ultimate reflective display would simply place the best colorants used by the printing industry directly beneath the front viewing substrate of a display,” he says. “In our EFD pixels, we are able to hide or reveal colored pigment in a manner that is optically superior to the techniques used in electrowetting, electrophoretic and electrochromic displays.”

Because the optically active layer can be less than 15 microns thick, project partners at PolymerVision see strong potential for rollable displays. The product offerings could be extremely diverse, including electronic windows and tunable color casings on portable electronics.

Furthermore, because three project partners are located in Cincinnati (UC, Sun Chemical, Gamma Dynamics), technology commercialization could lead to creation of numerous high-tech jobs in southwest Ohio.

To expedite commercialization, a new company has been launched: Gamma Dynamics with founding members of this company being John Rudolph as president (formerly of Corning), a world-recognized scientist as CTO (who cannot be announced until July), and Heikenfeld as principal

scientist.

“This takes the Amazon Kindle, for example, which is black and white, and could make it full color,” Heikenfeld says. “So now you could take it from a niche product to a mainstream product.”

Provided by University of Cincinnati (news : web)