

- [Skip to Content](#)
- [Skip to Channel Navigation](#)
- [Skip to Information Links](#)
- [Skip to Accessibility Information](#)



- [Home](#)
- [News](#)
- [Jobs](#)
- [pressXchange.com](#)
- [packagingnews.co.uk](#)
- [Archive](#)
- [Bulletins](#)
- [Directory](#)

You are here:

- [Home:](#)
- [News:](#)
- Researchers smash the inkjet resolution barrier

12 September 2007: 11.50

- [Pre-media](#)
- [Digital](#)
- [Post-press](#)
- [Presses](#)
- [Print Buying](#)
- [Paper](#)
- [Materials](#)
- [Business](#)
- [Environment](#)
- [Design](#)

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### Researchers smash the inkjet resolution barrier

Matt Whipp, [printweek.com](http://printweek.com), 11 September 2007

Scientists at the University of Illinois have made an inkjet breakthrough that offers higher print resolutions by using nano-scale nozzles and electrically induced fluid flow.

The jet-printing innovation produces dots as small as 250 nanometres (nm) and lines as narrow as 700nm.

But John Rogers, a founder professor at the Materials Science and Engineering department, told [printweek.com](http://printweek.com) that even greater resolutions are possible.

"We have results that suggest that possibility of 100nm. These dimensions correspond to 100,000dpi," he said. "These resolutions are experimental. We routinely can achieve dots of 1-2microns in diameter, corresponding to approximately 10,000dpi."

To achieve this level of detail, the researchers use a process known as electrohydrodynamic jet (e-jet) printing, in which electrical fields draw ink through the printhead.

The printhead used has 300nm-diameter gold-coated microcapillary nozzles mounted on a computer-controlled mechanical support.

The team successfully printed an array of fully operational transistors and electrodes onto a substrate. It is now looking into scaling up the nozzle count to improve print speeds.

In regards to real-world applications, Rogers said: "Security applications would be one example." The process could be used to create fine patterns that would be impossible to copy or replicate.

"We are most interested, however, in using the tool and approach to fabricate functional devices, in printed electronics, photovoltaics and biotechnology areas," he added.

Rogers said it could offer an economical way to print e-paper displays because "as with conventional inkjet, the materials are utilised in an efficient manner".

However, commercial realisation is some way off.

"If challenges could be overcome, one might see niche applications in five to 10 years," he said.

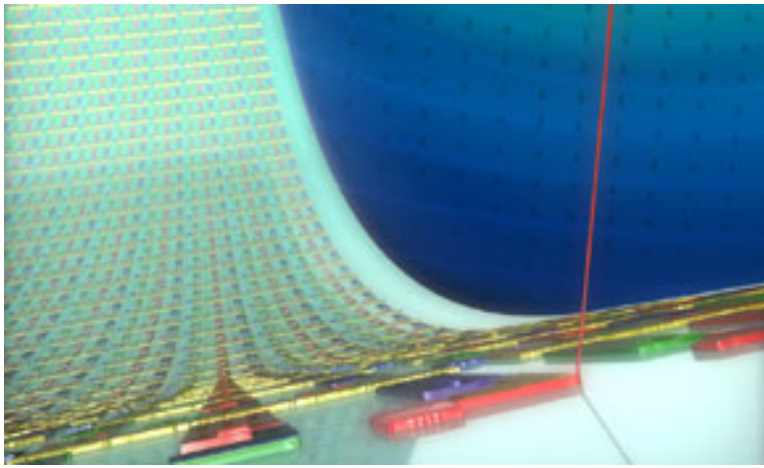
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