



O'REILLY

Jump into the new .NET and ASP.NET

Buy 2 books, get the 3rd **FREE!** (Use discount code "opc166")



Dr. Dobb's Portal

The World of Software Development

[ABOUT US](#) | [CONTACT](#) | [ADVERTISE](#) | [SUBSCRIBE](#) | [SOURCE CODE](#) | [CURRENT PRINT ISSUE](#) | [FORUMS](#) | [NEWSLETTER](#)

[Blog Home](#) | [Department Home](#) | [More Blogs](#) | [RSS](#)



EDITOR'S EYE

The World of Software Development.

by [Jon Erickson](#)



September 07, 2007

Nanoscale Nozzles = High-Res Printing

When it comes writing utensils, it's hard to beat a pencil. They're durable, user friendly, inexpensive, and, assuming the eraser isn't worn down, enable easy editing. Mechanical pencils with replaceable lead were a great leap forward, of course, especially since pencil sharpeners seem to gone the way of buggy whips and pay phones. And if you really want to, you can connect a pencil to a computer, assuming you like working with flat-bed plotters and the like.

But no, #2 pencils aren't good enough for researchers at the [University of Illinois](#), who have improved on a process called "electrohydrodynamic jet printing process" (e-jet) by combining electrically induced fluid flow with nanoscale nozzles. Unlike familiar ink-jet printers which use heat or mechanical vibrations to launch liquid droplets through a nozzle, e-jet printing uses electric fields to pull the fluid out. While this isn't a new, the introduction of nanoscale nozzles and precision controlled electric fields is new.

"We have invented methods for an electrohydrodynamic jet (e-jet) printing process that can produce patterns and functional devices that establish new resolution benchmarks for liquid printing, significantly exceeding those of established ink-jet technologies," says [John Rogers](#), professor of Materials Science and Engineering. What Rogers' team did was build a tiny e-jet printing head that consists of a gold-coated microcapillary nozzle (with a diameter as small as 300 nanometers) mounted on a computer-controlled mechanical support. An organic, Teflon-like coating on the gold ensures the ink

RECENT ENTRIES

- [Nanoscale Nozzles = High-Res Printing](#)
- [Simulations and the World Community Grid](#)
- [Second Life Happenings](#)
- [Mirror, Mirror...](#)
- [Dr. Dobb's Digital Publishing: \(Way\) Before Silverlight](#)
- [Spec#: Contracts for C# and Then Some](#)
- [Knock, Knock...](#)
- [Minature Wind, Big Results](#)
- [One Man's Fluid Dynamics Is Another Man's NASCAR Race](#)
- [Seeing Your Smoke and Breathing It Too](#)

Microsoft

See if you
Click to ex
the "
DEFY

flows cleanly out the nozzle toward the target. Tiny droplets of ink eject onto a moving substrate to produce printed patterns. Lines with widths as narrow as 700 nanometers, and dots as small as 250 nanometers, can be achieved in this fashion.

Rogers goes on to say that this type of e-jet printing will likely be used for large-area circuits, displays, photovoltaic modules and related devices, and as well as in security, biotechnology, and photonics. "The neat thing is that we find that this extremely high-resolution form of e-jet printing can also be used for diverse systems, such as printing microarrays of DNA spots for bioanalysis, or printing carbon nanotubes and other classes of nanomaterials that are difficult to pattern in other ways," he explains.

Posted by Jon Erickson at 09:36 AM [Permalink](#)

Please [log in](#) to post comments.

This is a public forum. CMP Media and its affiliates are not responsible for and do not control what is posted herein. CMP Media makes no warranties or guarantees concerning any advice dispensed by its staff members or readers.

Community standards in this comment area do not permit hate language, excessive profanity, or other patently offensive language. Please be aware that all information posted to this comment area becomes the property of CMP Media LLC and may be edited and republished in print or electronic format as outlined in CMP Media's [Terms of Service](#).

Important Note: This comment area is NOT intended for commercial messages or solicitations of business.

SEPTEMBER 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

MONTHLY ARCHIVES

- [September 2007](#)
- [August 2007](#)
- [July 2007](#)
- [June 2007](#)
- [May 2007](#)
- [April 2007](#)
- [March 2007](#)
- [February 2007](#)
- [January 2007](#)
- [December 2006](#)
- [November 2006](#)
- [October 2006](#)
- [September 2006](#)
- [August 2006](#)
- [July 2006](#)
- [June 2006](#)
- [May 2006](#)
- [April 2006](#)

BLOGROLL

- [If You Build It](#)

INFO-LINK

[Silverlight: Your lang applied to Rich Interr Application design. Le more.](#)

[Don't Press Your Lu Find Application Prob Sooner.](#)

[Learn about Intel® A Management Technol build manageability applications](#)

[BE HEARD: take a su and enter to win \\$50!](#)



Multi-Core Is Mainstre

[RSS](#) |

[Copyright © 2007 CMP Technology](#), [Privacy Policy](#), [Your California Privacy Rights](#), [Terms of Service](#)
Comments about the web site: webmaster@ddj.com

SDMG Websites: [BYTE.com](#), [DotNetJunkies](#), [MSDN Magazine](#), [Sys Admin](#), [SD Expo](#), [SqlJunkies](#), [TechNet Magazine](#), [Unix](#)