

Joint carbon nanotube memory program for high-density, next-generation memory below 20nm launched

November 1 2012

Imec, a world-leading research institution in nanoelectronics and Nantero, Inc., a nanotechnology company using carbon nanotubes (CNTs) for the development of next-generation semiconductor devices, have announced a joint development program. The collaboration will focus on the carbon-nanotube-based memory developed by Nantero, NRAM, and its application in high-density next-generation memories with a size under 20nm. NRAM arrays will be manufactured, tested and characterized in imec's advanced nanoelectronics facilities.

Carbon nanotube memory is based on the carbon nanotube, "[CNTs](#)", cylindrical [carbon molecules](#) about a nanometer across and up to a millimeter long, which exhibit extraordinary strength, unique electrical properties and efficient [heat conduction](#), making carbon nanotubes a highly promising material for future memories

"After review of the progress to date by Nantero and its manufacturing partners, we decided that this CNT-based non-volatile memory has multiple very attractive characteristics for next-generation highly scaled memory," said Luc Van den hove, CEO of imec. "By taking a leadership position in this area of development, in partnership with Nantero, we will be able to bring substantial benefit to our member companies."

Nantero has already fabricated high-yielding 4Mb arrays of NRAM in CMOS production environments, with several important performance

advantages: write speed has been shown to be as fast as 3 nanoseconds; endurance is expected to be unlimited and has been tested so far to over a trillion cycles, with low operating power and superior high temperature retention.

"Together, Nantero and imec can develop and demonstrate this form of memory for future applications below 20nm such as terabit-scale memory arrays and ultra-fast gigabit-scale nonvolatile cache memories," commented Jo de Boeck, CTO of imec, "NRAM holds clear promise in aggressively scaled Non-Volatile Memory applications and, if we can demonstrate the suitable endurance and speed specifications, NRAM could even provide an alternative for DRAM that is facing scaling limitations beyond 18nm."

"Nantero is pleased to work with imec as a partner," said Greg Schmergel, Nantero's co-founder and CEO. "Nantero is already working with world-leading manufacturers, and working with imec will enable these efforts to bring [carbon nanotube](#) memory to market to move even faster."

Provided by IMEC

Citation: Joint carbon nanotube memory program for high-density, next-generation memory below 20nm launched (2012, November 1) retrieved 8 May 2024 from <https://phys.org/news/2012-11-joint-carbon-nanotube-memory-high-density.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--