



## Applied Materials AI(x) Platform Harnesses the Power of Big Data and AI to Accelerate Semiconductor Technology Breakthroughs from Lab to Fab

April 5, 2021

SANTA CLARA, Calif., April 05, 2021 (GLOBE NEWSWIRE) -- Applied Materials, Inc. today announced AI<sup>X</sup>™, an innovative platform that accelerates the discovery, development and commercial deployment of new chip technologies.

AI<sup>X</sup>, which stands for Actionable Insight Accelerator, enables engineers to see into semiconductor processes in real-time, take millions of measurements across wafers and individual chips, and optimize thousands of process variables to improve semiconductor performance, power, area-cost and time to market (PPACT). The AI<sup>X</sup> platform works across all Applied Materials process equipment, eBeam metrology systems and inspection systems and is extendable from lab to fab. By providing engineers with the ability to fingerprint innovative recipes during R&D, AI<sup>X</sup> accelerates their transfer and ramp into high-volume manufacturing (HVM). AI<sup>X</sup> is already in use today, improving the PPACT of both logic and memory chips.

"Accelerating the 't' in PPACT is the biggest value driver for all the companies in our ecosystem," said Prabu Raja, senior vice president and general manager of the Semiconductor Products Group at Applied Materials. "AI<sup>X</sup> connects all the capabilities of Applied in new ways with the goal of cutting development time in half and improving process windows by one third. We have been developing AI<sup>X</sup> over the past three years to provide engineers with an entirely new kind of toolkit to solve the increasingly complex challenges of our industry."

"AI<sup>X</sup> uses the power of big data and AI to give customers better outcomes at every stage of the semiconductor technology lifecycle, from R&D to ramp and HVM," said Raman Achutharaman, group vice president, Semiconductor Products Group at Applied Materials. "Engineers have thousands of process variables to choose from, and only a handful of elusive correlations provide the key to optimizing recipes for world-class results. AI<sup>X</sup> identifies and magnifies this actionable data, providing engineers with the actionable insights needed to accelerate PPACT."

"Once again, Applied Materials is adding real value to the semiconductor industry with big data analytics in the form of its AI<sup>X</sup> platform for the process engineering ecosystem," said Dan Hutcheson, CEO and chairman of VLSIresearch. "AI<sup>X</sup> moves beyond the decades-old statistical process control methods based on linear data streams to a new multidimensional world where data from 3D images, in-situ metrology and sensors can be stacked and then distilled into information that can be acted on. Applied's AI<sup>X</sup> is a new toolkit that promises to accelerate R&D, thereby shortening time to results and ultimately time to money. I expect AI<sup>X</sup> algorithms will be ported to production to control the process with real-time chamber control."

The AI<sup>X</sup> platform includes:

- ChamberAI™: New sensors and machine learning algorithms for Applied Materials process chambers that provide engineers with real-time analytics of variables including chemistry, energy, pressure, temperature and duration.
- On-board metrology: Unique in-vacuum metrology that enables new films to be measured as they are being deposited, with angstrom-level precision.
- Inline metrology: Unique algorithms based on Applied eBeam metrology which can provide a 100-fold increase in measurement speed versus legacy approaches along with 50 percent higher resolution. Engineers can obtain over one million 3D wafer measurements per hour to make nanometer-scale assessments of how miniscule changes in recipes affect on-chip devices and structures.
- AppliedPRO™: Process Recipe Optimizer generates digital process maps that help accelerate materials and recipe development, reduce variability and widen process windows. AppliedPRO can be used to optimize individual chambers and tools as well as accelerate matching across a fleet of systems.
- Digital twins: The AI<sup>X</sup> platform includes digital twin models of select Applied Materials chambers and systems that enable virtual experiments which accelerate recipe development, improve matching and ramp transfer, and optimize output and yield in high-volume production.
- Computing: The AI<sup>X</sup> platform includes the computing resources needed to store and analyze massive data using machine learning and AI algorithms.

Applied Materials will share AI<sup>X</sup> case studies at its [2021 Investor Meeting](#) on April 6 and at Master Class events scheduled for May 5 and June 16, 2021.

### About Applied Materials

Applied Materials, Inc. (Nasdaq: AMAT) is the leader in materials engineering solutions used to produce virtually every new chip and advanced display in the world. Our expertise in modifying materials at atomic levels and on an industrial scale enables customers to transform possibilities into reality. At Applied Materials, our innovations make possible the technology shaping the future. Learn more at [www.appliedmaterials.com](http://www.appliedmaterials.com).

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Source: Applied Materials, Inc.