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## MESSAGE FROM PRESIDENT:



As the year 2013 comes to a close, I wish to send out greetings to all of Park Systems customers and users across the country and express my sincere appreciation for the loyal support we have received for our AFM products. With the introduction of Park AFM, the nanoscale industry exploded with new research grade AFM's that could provide scientists and engineers with an astounding new level of cost effective, reproducible, and reliable results for quality control and failure analysis at the nanoscale level. Over the years, Park's team of scientific product experts have advanced AFM thru a series of revolutionary features including Crosstalk Elimination, True non-contact mode, 3D AFM. And in the year 2013, the team at Park

pushed the science of AFM to new frontiers, with the introduction of several new products that are aimed at making AFM more affordable without compromising quality and performance. Overall, the year 2013 has been a challenging one for the research market in many respects due to budget cuts and sequestration, and for this reason Park developed the most affordable research-grade AFM Park XE 7. As our primary goal is to make it easy to purchase and use Park AFM products, our eye toward the needs of our customers is always searching for means to maximize affordability. So, despite challenging times, Park was able to extend a special promotion during the launch of this product, offering an extraordinary \$10,000 Acoustic Enclosure and Vibration Table at purchase.

In 2013 Park also introduced two additional products that provide superior performance and cost-effective solutions, Park NX 20 is the most powerful AFM for the failure analysis market and Park NX -HDM is a superior high performance industrial AFM. We also introduced PinPoint Conductance Microscopy which provides virtually frictionless conductance AFM, and the QuickStep SCM that speeds the measurement of capacitance by nearly tenfold.

Park's newest product introduction, the Park XE15 is a large sample AFM

that provides versatility for shared lab facilities with a unique Multi-Sample Scan feature that speeds multivariant experimentation by many folds at one push of a button. In 2014, Park has exciting plans that include more innovative products and enhancements designed to Enable Nanoscale Advances. Our plan for 2014 is to have active communication with the user community to understand the needs of the scientists and engineers working at nanoscale, staying in touch with you through many means including this quarterly newsletter, social media, user group meetings and personal interface.

"Enabling Nanoscale Advances", Park's new tag line, states our pledge to help you further your research and solve engineering problems effectively, and easily. This word "easily" is very important to me and everyone at Park, as we strive to make our AFM systems very easy for you to learn and operate. You will soon hear exciting Park announcements on the next generation AFM operating system that we will introduce that will make scanning easy and boost researcher productivity.

In closing this message, I wish you happy holidays, and a great start of the New Year.

-Keibock Lee, President, Park Systems Inc.

## PARK SYSTEMS TOURS UNITED STATES SCHEDULING AFM USER GROUP EVENTS IN MAJOR CITIES



Park Systems has been offering a series of Park AFM User Group sessions to current Park Systems AFM users, researchers and universities throughout the United States. The high demand for Park AFM has created a loyal following for Park's unmatched AFM technology solutions. The Park User Group meetings offer an opportunity for face-to-face interaction, brainstorming and analysis that can only be achieved with in person meetings. The Park User Group meetings are free and open to scientists, engineers and university students who want to learn more about AFM technology.

"We find it rewarding when touring major cities to meet so many users who are committed to Park AFM and jointly engage in scientific discussion

on the increasing requirements of industry for AFM and nanotechnology", explains Keibock Lee, Park Systems President. "Our focus continues to be on the customer and to provide them with an AFM product that has offers both superior performance as well as a cost effective solution."

A typical program at a Park User Group meeting includes a demonstration of the next generation Park NX10 AFM and new software tools for the most accurate, fastest and extremely reliable results in nanotechnology. Park Systems Founder Dr. Sang-il has been a regular speaker at the events, discussing issues such as the Advances in Scanning Probe Microscopy and their Application to AFM. Ji Won Suk, Postdoctoral Fellow UT Austin and Park Systems also frequently presents on the various topics such as the Mechanical Characterization of Suspended Membranes Using Contact Mode AFM Imaging.

So far Park Systems has held events in Austin, TX, San Francisco CA, Boston MA and has additional events planned for this year. The User events are well attended by local businesses and universities. The advancements in nanotechnology require measurements at the nanoscale level that are accurate, repeatable, and reliable and the technology that Park Systems has developed offers unique solutions that provides these benefits for both research and industry. Park Systems is a leader in helping major universities and world-class corporations achieve unparalleled results in nanometrology. This innovative technology is discussed and demonstrated at the events.



# Park

## SYSTEMS

## ATOMIC FORCE MICROSCOPY IMAGE CONTEST WINNERS ANNOUNCED PARK SYSTEMS PRESENTS THE FIRST ANNUAL AFM 2014 CALENDAR

This year, Park Systems 3D AFM image contest offered AFM users a chance to win prizes and appear in the 2014 calendar. The winning images were selected by a team of judges from Park Systems and were chosen based on any of the following three criteria: Image Quality, Visual Appeal, and Highly Interesting Application. The contest was open to all scientists, engineers, researchers and others who work with AFM who were invited to submit their favorite AFM image for consideration. Twelve winners were selected to receive prizes and appear in the Park Systems 2014 calendar. Each of the twelve selected winners who will appear in the calendar have an image caption and credit under their image, identifying the winning institution.

The winning image was submitted by **Namuna Panday**, Graduate Student, Florida International University

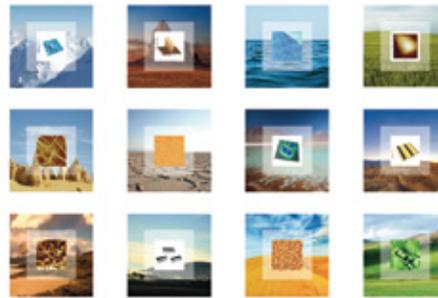


“We rely on Park XE Bio’s proven advanced nanotechnology design for our scientific research into how cells interact for cancer treatment, gene delivery and in other research in our labs because it is a very reliable and accurate AFM.”

[Read more.](#)

### Park 2014 AFM Calendar

Park Systems, Enabling Nanoscale Advances



The runners up this year were:

- Ronaniel A. Almeda, Research Associate, University of the Philippines Los Baños
- Dr. Gwan-HyongLee, Postdoctoral Research Scientist, Columbia University
- Dr. Richard Piner, Research Scientist, University of Texas, Austin

Congratulations to all of this year’s AFM Image Contest Winners and we look forward to next year’s submissions. Watch for details for the Annual AFM contest and other opportunities in upcoming newsletters.

## FEATURE ARTICLE (FEATURED IN SOLID STATE TECHNOLOGY NOV 2013)

### PARK INTRODUCES THREE-DIMENSIONAL ATOMIC FORCE MICROSCOPY: CHANGING THE FUTURE OF NANOMETROLOGY FOR THE SEMICONDUCTOR AND OTHER INDUSTRIES

The Three-Dimensional Atomic Force Microscopy (3D AFM) by Park Systems is an innovative and cost effective means of accurately characterizing the roughness and the sidewall morphology of photoresist semiconductors and was created by industry’s need for a nanoscale measurement tool that surpassed the limited scans available using SEM. As the device critical dimension decreased, industry demanded an advanced method for high resolution data. 3D AFM offers a

unique solution to the challenges facing Semiconductor manufacturers and provides many cost effective and resolution advantages not previously available in standard systems. One of the most unique features of Park 3D AFM is the independent Z-scanner that can be tilted in order to gain access to the sidewalls of the material and, hence, measure its critical dimensions (CD), its Sidewall and Line Edge Roughness (SWR and LER respectively). [Read more.](#)

## PARK IN THE NEWS

### PARK SYSTEMS DOMINATES THE AFM DISC STORAGE MARKET WITH SUPERIOR TECHNOLOGY AND SERVICE: WORLDWIDE MARKET SHARE REACHES 90 PERCENT

Park Systems, a leading manufacturer of atomic force microscopy (AFM) systems and nano metrology tools for research labs and industry has recently announced a 90 percent market share in the disc storage market for AFM. Park AFM offers superior technology and performance unmatched by the competition,

specifically the highest accuracy in nanoscale due to the independent XY stage and Z scanner architecture, and flexure based design, the low operating cost by its unique True Non-Contact AFM, and many automated features for ease of use in failure analysis lab and production environments. [Read more.](#)



### PARK SYSTEMS INTRODUCES PARK NX-HDM: FULLY AUTOMATED AUTOMATIC DEFECT REVIEW AND SUB-ANGSTROM SURFACE ROUGHNESS FOR HARD DISK MEDIA AND SEMICONDUCTOR SUBSTRATES

Park Systems, world leader in atomic force microscopy (AFM) for the semiconductor and hard disk markets introduces Park NX-HDM, a fully automated automatic defect review and sub-angstrom surface roughness atomic force microscopy (AFM) system for device substrates and disk media, the first metrology tool capable of providing this level of accuracy

and automation. The NX-HDM system sets a new standard for the industry in automatic defect review AFM technology by increasing throughput up to 1000 percent and an offering of 30% higher success rate than prior system, analyzing, identifying and scanning media for all wafer sizes up to 150mm. [Read more.](#)

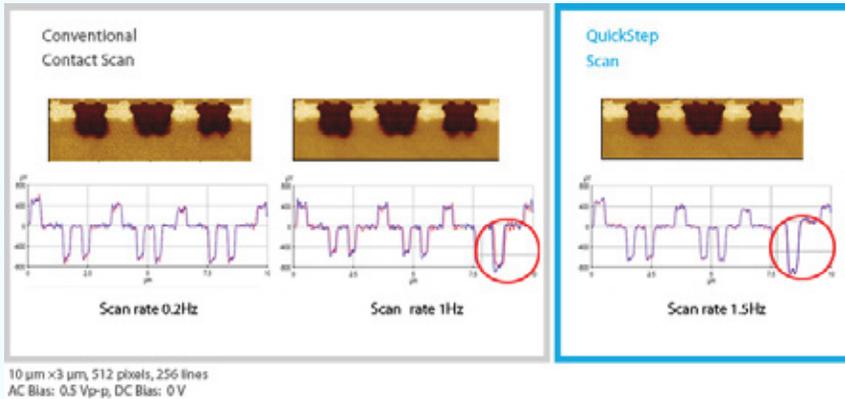


### PARK SYSTEMS ANNOUNCES PINPOINT CONDUCTIVE AFM

Park Systems, a leading manufacturer of Atomic Force Microscopy systems since 1997 announced PinPoint Conductive AFM, an extremely accurate conductive measurement technology at nano-scale resolution for failure analysis (FA) in the semiconductor industry. The PinPoint Conductive technology provides on-location electrical conductivity data at specific

points on sample to researchers and failure analysis engineers. What that means is that scientists and engineers can now acquire contact current measurement at any specific location of a sample at varying tip pressures, and at a much higher accuracy and precision than what has been possible to-date. Added benefits from this technology are frictionless conductivity scanning,

reproducible data from repeated measurements, cost savings from longer lasting AFM probe tips, and sustained super high nano-resolution. The PinPoint Conductive AFM is designed to integrate with popular Park NX20 and Park NX10, the leading choice for atomic force microscopy in the research and semiconductor industry. [Read more.](#)



**NEW PRODUCT ROUND UP**

**PARK SYSTEMS INTRODUCES THE PARK XE7: THE SCIENTIFIC INDUSTRY'S MOST AFFORDABLE, RESEARCH-GRADE AFM WITH INNOVATIVE DESIGN FEATURES**

New to the product line up is Park XE7, the scientific industry's most affordable, research-grade AFM with innovative design features. The Park XE7 provides AFM researchers with a cost-effective solution, which includes Park's proprietary technology, without compromising quality or functionality, a key distinction from more conventional AFMs

**PARK SYSTEMS UNVEILS NEWPARK XE 15: POWERFULLY VERSATILE ATOMIC FORCE MICROSCOPE WITH UNIQUE MULTISAMPLE™ SCAN**

Park Systems just announced the debut of Park XE15, a powerfully versatile atomic force microscope featuring a unique MultiSample™ scan. This newly developed large sample AFM provides researchers and operators with the ability to automatically image and measure up to nine individual samples. Park XE15 can also easily scan

larger samples of up to 200 mm x 200 mm, a vast improvement from the current AFM products on the market. Park XE15 is ideally suited for shared labs environments that handle a diverse range of samples, researchers doing multi variant experiments, and failure analysis engineers working on wafers. [Read more.](#)

“WE CONTINUE TO SET NEW STANDARDS OF EXCELLENCE WITH OUR NEW TECHNOLOGY AND HIGH ACCURACY IN AFM IMAGING AND MEASUREMENTS, ”

SAYS DR. SANG-IL PARK, THE FOUNDER AND CEO OF PARK SYSTEMS.

“PARK XE15 FEATURES OUR MOST INCLUSIVE SET OF SCAN MODES AND CAN PROCESS A RANGE OF SAMPLE SIZES, DESIGNED SPECIFICALLY TO PROVIDE EASE OF USE FOR SHARED LABS WITH A WIDE RANGE OF INDIVIDUAL REQUIREMENTS. ”

“OVER THE MANY YEARS THAT I HAVE WORKED WITH PARK SYSTEM, I HAVE FOUND THEM VERY RESPONSIVE TO CUSTOMER FEEDBACK IN DEVELOPING NEW PRODUCTS. PARK XE 15 IS A PROBLEM-SOLVER FOR ENGINEERS WHO NEED TO PROCESS MULTIPLE SAMPLES SIMULTANEOUSLY IN A CONTROLLED ENVIRONMENT, ”

COMMENTS AHMED A. BUSNAINA, PROFESSOR AND DIRECTOR THE NSF NANOSCALE SCIENCE AND ENGINEERING CENTER FOR HIGH-RATE

NANOMANUFACTURING (NSEC) AND THE NSF CENTER FOR MICROCONTAMINATION CONTROL, NORTHEASTERN UNIVERSITY.

“THE PARK ENGINEERING TEAM IS A GREAT NANOSCALE PARTNER, WORKING IN UNISON WITH CUSTOMERS TO CREATE PRODUCTS THAT MEET CUSTOMER PERFORMANCE REQUIREMENTS. ”