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EBEAM INITIATIVE ANNOUNCES EDUCATION AND COLLABORATION FOCUS ON REACTIVATING DENSITY BENEFITS OF MOORE'S LAW

Holon and Photronics become latest companies to join eBeam Initiative

SAN JOSE, Calif., February 17, 2015—The eBeam Initiative, a forum dedicated to the education and promotion of new semiconductor manufacturing approaches based on electron beam (eBeam) technologies, today announced that its top theme for 2015 will be the **reactivation of the density benefits of Moore's Law through eBeam technology**. Efforts to educate, collaborate and promote this theme to the photomask and lithography community will include focusing on how new developments in **multi-beam mask writing** and **model-based mask data preparation (MB-MDP)**, coupled with **complex inverse lithography technology (ILT)**, can reverse the trend of rectilinear constraints on mask designs and enable **continued density scaling at the 10-nm node and beyond** using 193-nm immersion lithography techniques.

In related news, Holon, a leading photomask and wafer metrology provider, and Photronics, a leading semiconductor photomask manufacturer, have joined the eBeam Initiative. "We are very pleased to welcome Holon and Photronics as new members to our eBeam community, and look forward to adding their unique perspectives, collaboration and industry leadership in support of the Initiative's educational goals," stated Aki **Fujimura, CEO of D2S, the managing company sponsor of the eBeam Initiative**. Industry luminary **Dr. Chris Progler, chief technology officer and strategic planning at Photronics**, will provide his perspective on the 10-nm logic node at the eBeam Initiative's annual luncheon event taking place next week at the **SPIE Advanced Lithography Conference** in San Jose, Calif.

Among other developments, the eBeam Initiative will continue to publish its *Fine Line Video Journal*, which offers unique insights into emerging industry developments that are shaping the wider eBeam technology ecosystem for advanced photomask and semiconductor manufacturing. A video interview with **Colin Harris, founder and chief operating officer of PMC-Sierra**, on the **rising density benefit gap in Moore's Law from a fabless semiconductor perspective**, has been pre-released and is

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available for download at www.ebeaminitiative.org/. Aki Fujimura will highlight this theme in his opening address at the eBeam Initiative luncheon event at the SPIE Advanced Lithography Conference.

"As Colin Harris has stated, while the performance per watt aspect of Moore's Law has held true, we have **reached a point with traditional rules-based designs where the rules are so conservative** and the implementation costs are so high that the semiconductor industry has started to lose the economic benefits of scaling to smaller design nodes for system-on-chip (SOC) designs," stated **Fujimura**. "A simulation-based approach combining complex ILT, MB-MDP and existing variable shaped beam (VSB) mask writers in parallel with the impending emergence of multi-beam mask writing are providing platforms to **enable the semiconductor industry to reverse this trend** and reactivate the density benefits associated with Moore's Law. This is truly an exciting time to be a part of the eBeam ecosystem to help take part in our community's contributions to Moore's Law."

Colin Harris' video along with additional video interviews will be included in the Spring 2015 edition of the *Fine Line Video Journal*, which will be posted on the eBeam Initiative website on March 16.

About The eBeam Initiative

The eBeam Initiative provides a forum for educational and promotional activities regarding new semiconductor manufacturing approaches based on electron beam (eBeam) technologies. The goals of the Initiative are to reduce the barriers to adoption to enable more integrated circuit (IC) design starts and faster time-to-market while increasing the investment in eBeam technologies throughout the semiconductor ecosystem. Members and advisors, which span the semiconductor ecosystem, include: aBeam Technologies, Advantest, Alchip Technologies, AMTC, Applied Materials, Artwork Conversion, Aselta Nanographics, Cadence Design Systems, CEA-Leti, D2S, Dai Nippon Printing, EQUIcon Software GmbH Jena, eSilicon Corporation, Fastrack Design, Fraunhofer CNT, Fujitsu Semiconductor Limited, GenISys GmbH, GLOBALFOUNDRIES, Grenon Consulting, Hitachi High-Technologies, Holon, HOYA Corporation, IMS CHIPS, IMS Nanofabrication AG, JEOL, KLA-Tencor, Maglen, Mentor Graphics Corporation, Multibeam Corporation, NCS, NuFlare Technology, John Chen from NVIDIA, Petersen Advanced Lithography, Photronics, Colin Harris from PMC-Sierra, Riko Radojcic from Qualcomm, Sage Design Automation, Samsung Electronics, STMicroelectronics, Synopsys, tau-Metrix, Tela Innovations, TOOL Corporation, Toppan Printing, Vistec Electron Beam GmbH, and Hugh Durdan from Xilinx. Membership is open to all companies and institutions throughout the electronics industry. To find out more, please visit www.ebeaminitiative.org.

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