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Process Control for
Microlithography XXV***

Christopher J. Raymond
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Introduction

The conference on Metrology, Inspection and Process Control for Microlithography:

With contributions from more than ten thousand authors, comprising more than three thousand technical papers, spanning twenty five years and hosted at two venues, there has been one conference bringing you the latest advances in metrology for the silicon industry and beyond. It is my pleasure to introduce the proceedings for the 25th anniversary of Metrology, Inspection and Process Control for Microlithography.

It is my distinct honor to be the chair of "Metrology 25" as it celebrates its silver anniversary. The conference had humble beginnings in small hotel rooms in the 1980s, where Diana Nyssonen established earlier conferences on metrology development at the National Bureau of Standards (NBS), and unofficially dates "Metrology" beyond twenty five years of age. Since then the conference has become a staple of Advanced Lithography, with good attendance, strong technical contributions and high paper counts. Looking back it is clear that co-locating lithography, metrology and resist conferences in Silicon Valley may be the root of the highly symbiotic relationships that benefitted everyone involved. In addition to acknowledging Diana's role as the metrology pioneer, educator and promoter, I would like to thank the early conference chairs for their vision and contributions, particularly Kevin Monahan and Michael Postek, who gave well received personal recollections that reflected on conference history during our opening session remarks this past year.

I also want to acknowledge and thank Bob McNeil, who led the University of New Mexico (UNM) scatterometry effort in the 1990s and was a regular at this conference during that era. Sadly Bob passed away earlier this year. Bob was my Ph.D. advisor at UNM, and in addition to being an excellent mentor, I also considered him to be a good friend. As an early pioneer in scatterometry he leaves a considerable legacy on this conference, but he also made strong contributions to the broader field of optics through his work in laser development, thin film coatings, optical roughness measurements and novel display technologies. Yet more important than anything, he was a true gentleman.

Finally, I wish to acknowledge the hard work of my program committee over the last two years. I also wish to extend special thanks to the staff at SPIE for all that they do to make the larger symposium a success year after year.

I am looking forward to Metrology 50! In the meantime, I hope to see you, your colleagues and your paper at Metrology, Inspection and Process Control for Microlithography XXVI!

Christopher J. Raymond

The Diana Nyssonen Memorial Award for Best Paper

Diana Nyssonen was a pioneer of dimensional metrology in microelectronics. Through her work at the National Bureau of Standards (NBS), she discovered the resolution of metrology with an optical microscope is much better than classical limits. Diana developed numerical models and became the first to make model-based measurements on photomasks, establishing the earliest critical dimension standards for our industry and the foundations of model-based metrology. Her work on optical edge detection and the imaging of thick layers, and advocacy for detailed modeling of the metrology process itself, invigorated dimensional metrology. She started the SPIE Conferences on Integrated Circuit Metrology in Arlington, Virginia in 1982.

Diana left NBS to form her own metrology company and later joined IBM at East Fishkill, New York. Her attention shifted from conventional microscopy to phase and amplitude imaging with interference microscopy. She also modeled secondary electron images for low voltage CD-SEM, and defined the requirements for AFM tips and sensing methods to enable CD-AFM.

Diana received her Ph.D. from the Institute of Optics, University of Rochester. Her personal contributions to the field and her many collaborations with metrology vendors, standards laboratories, consortia and academia, accelerated and broadly influenced the development of technology infrastructure and metrology applications.

As a part of SPIE's Advanced Lithography Symposium, the Metrology, Inspection and Process Control Conference is the leading international forum for the discussion and presentation of technical advances in the broader field of semiconductor metrology. The Diana Nyssonen Memorial Award for the Best Paper at this conference was established to recognize the most significant current contribution to semiconductor manufacturing and metrology for process control.

Due to the conference's long history, significant attendance and high paper counts, to win this Award requires a very significant new contribution to the field. The selection of the best paper is initiated during the conference by nomination, followed by extensive review by the program committee. It is based on both the technical merit and persuasiveness of the oral presentation as well as the overall quality of the published paper. Recent winners include leading international researchers in the area of semiconductor metrology and process control whose contributions have fundamentally improved the way semiconductors are manufactured.

We are pleased to honor the winners of the Diana Nyssonen Memorial Award for the Best Paper of 2010, as well as others who have won in previous years.

2010

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