The Photopolymer Science and Technology Award

The Photopolymer Science and Technology Award No. 251100, the Outstanding Achievement Award 2025, has been presented to Dr. Jos Benschop (ASML) in recognition of his remarkable contributions to the field of photopolymer science and technology, particularly for "bringing EUV Lithography from the research phase to high-volume manufacturing.".

Jos Benschop

Jos Benschop currently serves as Executive Vice President of ASML, the Netherlands. His distinguished career in semiconductor technology began at Philips Research (Eindhoven, NL, and Sunnyvale, USA) from 1984 to 1997. In 1997, he joined ASML as Head of Research, he was responsible for defining and executing a strategic program to identify the most promising Next Generation Lithography (NGL) technology.

ASML initially explored multiple NGL approaches, including:

- E-beam projection lithography (SCALPEL technology pioneered by Bell Labs [1])
- Ion-beam projection lithography (pioneered by IMS-Austria [2])
- Extreme Ultraviolet (EUV) Lithography, which had been under development since the mid-1980s in Japan [3], the USA [4], and Europe [5].

By 2001, ASML made the pivotal decision to discontinue research on e-beam and ion-beam lithography, choosing EUV Lithography as the preferred technology for future semiconductor manufacturing.

Realizing EUV technology for industrial applications required numerous breakthroughs, with one of the key challenges being the increase of EUV power from a few watts to several hundred watts [6]. Over the years, Dr. Benschop and his team reported significant advancements at international conferences [7,8], leading to the shipment of the first EUV Alpha-Demo Tools in 2006 [9]. These tools played a crucial role in refining EUV scanner technology and developing the supporting infrastructure, particularly EUV masks and resists.

The subsequent introduction of pre-production EUV tools in 2010 paved the way for the first commercial IC production using EUV lithography in 2019. Building on this success, ASML has further advanced EUV technology by developing a high-NA (Numerical Aperture = 0.55) EUV scanner, designed to enhance resolution and productivity [10]. Ongoing research aims to push these innovations even further [11].

Dr. Jos Benschop's contributions to semiconductor technology have earned him numerous accolades, including:

- SPIE Fellow (2010)
- Fellow of the Netherlands Academy of Engineering (2024)
- Advisor to the Dutch government and Parliament for Science, Technology, and Innovation,

appointed by the King of the Netherlands

Dr. Benschop's pioneering work has not only revolutionized the semiconductor industry but also laid the foundation for the continued advancement of EUV lithography, ensuring the sustainable progress of Moore's Law.

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