

## Long Live BACUS!

**Harry Levinson**  
Editor-in-Chief



In 1981, the Bay Area Chrome Users Society – BACUS – held its first symposium on photomasks and mask making in Sunnyvale, California. This event has since been held annually, now retitled as the Photomask Technology Conference, and taking place in conjunction with the EUV Lithography Conference. These jointly held conferences were well attended this year, with the highest attendance since 2008.

For its first 10 years, the BACUS Symposium was an independent event, with proceedings published by the BACUS organization. In most instances the proceedings papers were written by the authors, with figures included, as typical of proceedings papers today. Other papers consisted of transcriptions of the verbal portions of talks presented at BACUS conferences, sometimes accompanied by copies of the presentation slides. In 1991 BACUS became formally engaged with SPIE, and SPIE has been publishing this conference's proceedings ever since.

For many years, printed volumes of proceedings from early BACUS symposia could be found only on the shelves in home offices of attendees of those early meetings, and they were generally not available to most people. Recently, Jim Wiley, one of the founders of BACUS, offered to send his collection of conference proceedings to SPIE so they could be scanned and loaded into the SPIE Digital Library. The SPIE publications department agreed to this proposal, and the bound, printed volumes of early BACUS proceedings were sent to SPIE. As it turned out, Wiley had lent one volume to a colleague, and as so often happens, the volume was never returned. Fortunately, Bob Naber was able to find someone (Al Wong) who could provide the missing volume, and these early proceedings are now available for everyone who has access to the SPIE Digital Library (<https://www.spiedigitallibrary.org/conference-proceedings-of-SPIE/12805.toc>).

It is enlightening to read the proceedings from the early BACUS symposia. The first symposium in 1981 had a paper that outlined expectations for lithography for the remainder of the decade. It seems that lithographers have long been thinking in terms of a roadmap, even if not yet formally in 1981. There also were papers on mask defects, materials, and resists, topics that continue to be talked about today. Explained in the Symposium's Welcome Note was the value of conferences and professional societies as opportunities for lithographers to coordinate aspects of lithographic technology that do not provide a competitive advantage to any particular company and where synchronization can lead to greater manufacturing efficiencies. While our problems have become much more complex since the early 1980s, and we need to work at much greater levels of detail, many of the general concerns of lithographers involved with masks and mask making continue to be topics of papers presented at lithography conferences today.

At conferences such as Photomask Technology and EUV Lithography, lithographers worldwide often present preliminary results from their R&D activities. As their engineering projects advance and mature, this sometimes leads to papers being published in JM<sup>3</sup>. For a peer-reviewed journal such as JM<sup>3</sup>, a certain level of completeness is required, while there is a different expectation for papers presented at conferences and published in proceedings. At conferences it is exciting to see the newest results, even if the findings reported are only preliminary and incomplete. Papers that lead to more substantive conclusions, such as those found in JM<sup>3</sup>, are also an

important type of publication. I look forward to future papers published in JM<sup>3</sup> that are based on results first presented at the successor conferences to the BACUS Symposia, as well as at other lithography conferences, such as the Advanced Lithography + Patterning Symposium, Photomask Japan, and the European Mask and Lithography Conference.

In full disclosure, I should add that there was a personal reason for me to support the inclusion of past BACUS conference proceedings in the SPIE Digital Library, as I gave my first presentation as a lithographer at the 3<sup>rd</sup> BACUS Symposium (at the invitation of Jim Wiley). The title of my talk was “Impact of reticle imperfections on integrated circuit processing,” an early look at mask defect printability. Through some miscommunication, a proper written manuscript never was submitted, but a transcript of my talk, along with copies of the slides, is now part of the SPIE Digital Library.

I hope that readers of JM<sup>3</sup> can find some time to browse through the early BACUS proceedings that are now available in the SPIE Digital Library. They give us better opportunities to identify and recognize the people who pioneered lithographic technology. The early BACUS proceedings also provide some insight into how far lithographic technology has come while also showing what has remained the same in lithography over the years. Thank you to the SPIE publications staff for making available these proceedings papers from the early days of lithography!