JM³ Journal of Micro/Nanopatterning, Materials, and Metrology

EDITORIAL

Resources from SPIE for Lithographers

Harry Levinson
Editor-in-Chief

SPIE publications have long been an important resource for lithographers. This started in 1974, when the proceedings of a meeting on Technological Advances in Micro and Submicro[1] Photofabrication Imagery became Volume 55 in SPIE's collection of conference proceedings. Two years later, in 1976, the proceedings papers of a forerunner of today's Advanced Lithography + Patterning Symposium were published as Vol. 80, Developments in Semiconductor Microlithography. Since then, SPIE has published the proceedings of over 12,000 conferences on optical and related technologies, many of them dedicated to lithography.

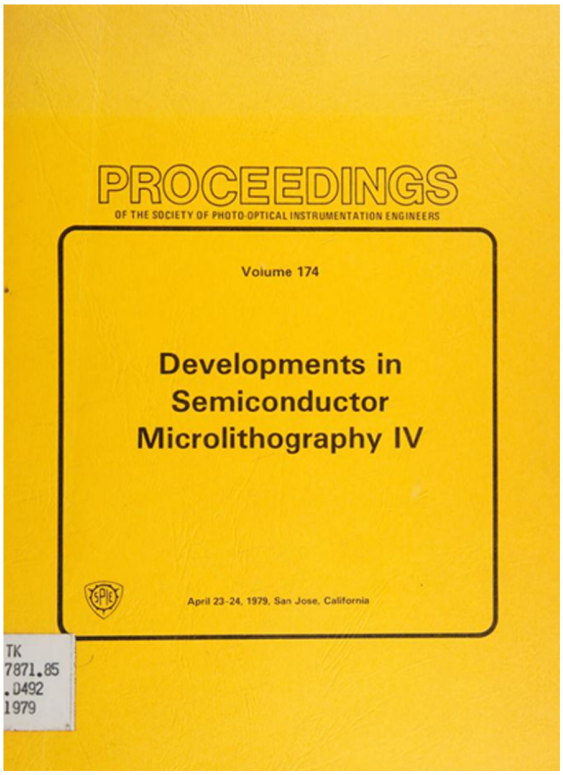
The early volumes of SPIE proceedings papers were important to my own development as a lithographer. At the time I was offered my first job in the semiconductor industry, by Advanced Micro Devices (AMD), I was working as a postdoctoral researcher in physics at the University of California, Berkeley. When I received the phone call from the recruiter at AMD, offering me a job, I was working in my laboratory in the basement of Leconte Hall. Much of my research in academia had involved the use of photoelectron spectroscopy, conducted in ultrahigh vacuum, to study the physics of surfaces, so I had gained expertise in vacuum technology. Many processes in semiconductor technology involve vacuum (plasma etching, film deposition, and ion implantation), so I felt I had qualifications for working on all processes involved in semiconductor fabrication – except lithography.

Naturally, AMD offered me a job in lithography. Since AMD was going to pay me twice the salary I was receiving at the university (and I would no longer need to pay for parking my car) I accepted the job offer immediately, even though I had only a vague idea what lithography was about. After completing the call with the recruiter, I then ran (literally) to the engineering library to find out exactly what lithography was.

In those days, one located material in libraries by means of card catalogues, which consisted of drawers containing cards with information that enabled a person to find books and journals according to author, title, or subject. While there did not seem to be any good books on lithography, with the information gleaned from the card catalogue, I found my way to a section of the engineering library where there were several volumes on the subject of lithography, all with bright yellow covers. I checked out from the library a few of these yellow books, which were volumes of proceedings papers from SPIE lithography conferences. As I wrapped up my work at the university, I read from these volumes during my commute on the train to and from Berkeley. By the time I started work at AMD, I had a pretty good idea what lithography is.

I began to attend SPIE's lithography conferences early in my career, and my personal collection of "yellow books" began to occupy several shelves. By the time conference proceedings became available digitally, there were many more volumes of proceedings papers (along with copies of JM³) on the bookshelves in my study than there had been in the engineering library when I first encountered SPIE's yellow books. This is a measure of how much has been learned about lithography over the years.

[1]Not a typographical error



Nowadays, SPIE publishes the proceedings from multiple lithography conferences:

- Advanced Lithography + Patterning
- Photomask Japan
- European Mask and Lithography Conference
- Photomask Technology & EUV Lithography

In addition to these conference proceedings, 32 books on micro/nanolithography are currently available from SPIE, and dozens of peer-reviewed papers on patterning technology are published annually in this journal. SPIE has long been, and continues to be, an important resource for lithographers. Information can be shared with the lithography community by presenting at conferences, and the audience can be widened when the presentations are recorded and made available through the SPIE Digital Library. However, written proceedings papers, which can be studied at the reader's pace and which provide references for background learning and further inquiry, have a deeper and longer-lasting impact.

In addition to SPIE staff, there are many volunteers who help to make information on lithography available. For conferences there are people who organize the meetings and chair technical sessions. JM^3 has editors who find reviewers and decide on the merits of submitted manuscripts, relying heavily on the work of the reviewers. There are now many books on lithography, some of which are overviews while others focus on special topics. All of us benefit from the people who help to make available important information on lithography – SPIE staff, editors, reviewers, and most importantly, the authors who create the content in the publications. I hope that readers of this journal will consider contributing as well – perhaps you might help another young lithographer start a career!