


Session I: MAEBL Foundations Workshop

Novice to advanced e-beam lithographers are invited to participate in Session I to learn, brush-up or help mentor others on the fundamentals of EBL. Advanced attendees are encouraged to impart personal accounts and challenges to the audience, elevating the workshop experience. At the end of the meeting beginners should be conversant in EBL and are encouraged to participate in Session II.

 Topic	Facilitator
10:00 Registration, Networking, Coffee	
11:00 Welcome, Opening Remarks and Introductions	Guy DeRose California Institute of Technology
11:10 EBL TOOL ANATOMY Tool vendors, the tools and their terminology	Mark Mondol Massachusetts Institute of Technology
12:00 Group Photo and Gather Lunch	
12:40 SPECIFICATIONS AND WHAT THEY MEAN A Lunch-and-Learn on tool specifications	Justin C. Wirth Purdue University
13:40 DATA PREPARATION AND PROXIMITY EFFECT Become conversant in the art of data prep and PEC	Gerald Lopez University of Pennsylvania
14:40 DECISION PROCESSES A discussion on the exposure parameter space	Bill Mitchell University of California Santa Barbara
15:40 Break/Continued Discussion and Networking	
16:10 RESIST PROCESSES Learn about modern EBL resists processes	Aimee Price The Ohio State University
17:00 - End MAEBL Foundations	

Charter Sponsors for The 2020 Meeting for Advanced Electron Beam Lithography



Program is subject to change without notice.

Session II: MAEBL Core

The core meeting is what started it all. Be part of the conversation and engage the collective knowledge of the electron beam lithography community.

 Topic	Facilitator
07:30	Registration, Networking, Coffee and Light Breakfast
08:00	Welcome, Opening Remarks and Introductions Guy DeRose California Institute of Technology
08:20	NEGATIVE RESIST DISCUSSION Negative resists, The HSQ Initiative and a New Resist Guy DeRose, Scott Lewis, Andy Thompson, Mike Rooks, Devin Brown Caltech, University of Manchester, DisChem, Yale University, Georgia Tech
09:45	CULTIVATING A NEW EBL USER GROUP: Transitioning from an SEM-based EBL Tool Mason Risley Carnegie Mellon University
10:30	Coffee Break/Continued Discussion and Networking
11:00	COMMON CHALLENGES I An Open Forum Discussion of Common Issues Mike Rooks, Aimee Price Yale University and The Ohio State University
12:00	Group Photo and Networking Lunch/Coffee
13:15	TOOL ADMINISTRATION AND TRAINING A Discussion on User Training Kevin Lister, Mark Mondol, Guy DeRose University of Delaware, MIT, and Caltech
14:15	MEASURING THE NANOMETER SCALE WITH AN OPTICAL MICROSCOPE Kevin Lister University of Delaware
15:00	SIMULATION + PEC Contrast Enhancement Through Simulation Kashif Awan University of British Columbia
15:45	Coffee Break/Continued Discussion and Networking
16:15	COMMON CHALLENGES II Open Forum Discussion of Common Issues Gerald Lopez University of Pennsylvania
17:15	Closing Remarks - Continued Discussion and Networking in a nearby location with adult beverages available (Rathskeller?)
18:00 - End Meeting	

This event is supported through sponsorship by Caltech. Program is subject to change without notice.

Common Challenges Potential Topics

The topics listed below are suggestions and won't necessarily be addressed unless you request them. If there's a topic below or one that is not mentioned that you'd like to have discussed at MAEBL, please submit it via the Google form at:

https://docs.google.com/forms/d/e/1FAIpQLSdxMW_squW8_Y9Cf2tf6EimsZuer0u31SO9c-yXYPyHD4ixw/viewform

- "Top Ten Stupid Ebeam Mistakes". Including:
 - Using tiny substrates
 - Using resist as glue
 - Destroying alignment marks and then trying to re-use them
 - Not grounding the SOI substrate (or GaN, whatever)
 - Grid snapping errors
 - Ignoring shape overhead
- Lift off resists and profiles
- Proximity Effect Correction - when do you do a new simulation for a point spread function? When does it really matter?
- RIE Etch Recipes for high resolution
- Pixel filling: What metric is used to properly fill an arbitrary shape so that the beam spots sufficiently overlap?
- How do you determine which writing conditions to use?
- What's the most annoying repetitive conversation you have in the cleanroom?
- For tool owners: how do you manage *high-maintenance* users?
- What's the dumbest/dangerous thing you've seen in the cleanroom?
- Where do all the tweezers go?
- Sample downsizing (a.k.a. cleaving)? Is this an issue? Particulates?
- Do we really need the finest beam spot (or beam step size) to write large waveguides?
- What's the strangest thing you've exposed and why? For example, we allow users at UPenn to put cured PDMS substrates coated with PMMA to pattern electrodes for flexible electronics.
- How do you deal with adhesion issues? What tricks are used if resist doesn't stick to the substrate after development?
- Anti-charging techniques: while Aimee shared some ideas in MAEBL 2017, it might be good to review these again in brief for those not in attendance.
- Having issues with stitching or shape positional accuracy? Mike Rooks will show some example solutions he's done. We can use the time to discuss other potential solutions.
- Buying a new tool? What to look out for?
- Low keV versus high keV: what difference does it make?
- Low current versus high current: when to use either?

REGISTRATION

On-site registration will not be available. You must sign-up online in advance. Thanks for your understanding. Fee schedule is as follows:

- Full Meeting Registration - Day 1 + 2:
 - **\$125** early bird registration before January 10, 2020
 - **\$160** general registration beginning January 11, 2020
 - Included Meals:
 - Breakfast (Tuesday only)
 - Lunch
 - Coffee breaks
 - Networking hour (Tuesday only)
- Day 1 Only - MAEBL Foundations Workshop:
 - **\$75**; sorry no early bird discount available
 - Includes lunch and coffee break
- Day 2 Only - MAEBL Core:
 - **\$85**; sorry no early bird discount available
 - Includes breakfast, lunch, coffee breaks, and networking hour (must be at least 21 to consume alcohol).

PARKING

On site parking is available at 370 South Holliston Ave, Pasadena, CA 91106. Parking is \$9/day.

GETTING HERE

If you're arriving by plane, you'll want to fly into either the Los Angeles International Airport (airport code: LAX) or the Hollywood Burbank Airport (airport code: BUR). It is about a 30 minute ride from BUR and 70 minute ride from LAX to Caltech.

HOTELS

There are over a dozen hotels that span E Colorado Blvd which translates to 5-15 minute cab ride depending on where you stay. Hotel night stays are as low as \$85 per night. MAEBL does not contract with any specific hotel. Any hotel or vendor indicating otherwise should be considered fraudulent.

REFUNDS

Registration refunds are available until March 30, 2020 (7 days prior to the event date); this means refunds cannot be issued beginning March 30, 2020, due to the catering reservation.