

New Era of Education Arrives in Wake of COVID-19-

EUVL Short Course Now Offered Online

Vivek Bakshi, EUV Litho, Inc.

May 25, 2020

In this blog, I will discuss the new era of learning and working that has been ushered in by COVID-19, and the role that EUVL will play in this transformation of our world. I will also describe the EUVL Short Course, which for the first time is being offered online to a worldwide audience, as education itself moves online!

New Era of Education and Working – What Role EUVL Will Play as Our Society Reconfigures?

One thing we all can agree on is that no one expected the impact that COVID -19 has had on our lives. Economic loss to restriction in movement is well beyond what anyone could have imagined even a few months ago, which is hopefully a once-in-alifetime experience. Now, we expect the reopening of society to speed up over the summer, and a vaccine to be ready later this year or in early 2021. Overall changes are immense and still are being estimated. Some are negative (like economic pain and the reconfiguration of business), but we also have some positives such as cleaner air, less time in traffic and more time with family. Some of these changes from the COVID-19 era are here to stay. As companies are letting employees work remotely, with some even making it a permanent option, workplaces are going to look different in the near future. I'm hearing that New York City skyscrapers may be sitting partly empty in the future as more companies shift to working outside offices. Some people are wondering if there was wisdom in investing in large campuses in Silicon Valley with fancy community rooms and kombucha bars, when most people can now work remotely!

I believe some of these changes were already in process and have been merely brought to front and most probably will be made permanent. For example, a large amount of our communication (meetings, education, chats) have now moved online to Zoom. However, Zoom has been around for many years and people were already transitioning to it for work and education. I know first-hand it was so in Austin, because of our worsening traffic situation.

My first interaction with Zoom was about three years ago. During the fall, I usually attend a lecture series in the north part of town. This means navigating Interstate35 traffic at rush hour to make the 7 PM lectures. It takes me 1-1.5 hours to make a drive which would take 20 minutes outside rush hour. As I was



complaining about that drive to the organizer, she said they had moved many of their programs online to Zoom, as people were tired of adding two hours of drive time to an hour and a half meeting! I still chose to drive and be there in person until last year, but I will not do so this year, even when things return to normal. After being on Zoom a lot in the last few months, I can get a similar value from Zoom for most of the events for which I would otherwise spend two hours in car.

Two years ago, I was approached to teach Sanskrit via Zoom to group of Yoga Therapists, scattered in a 50-mile geographical area around Austin. I also used various tools to track homework, distribute reading assignments and give grades. The course was well received, although I never met any of the students in person. Again, at that time, I never thought that someday I would be teaching again virtually. Then COVID-19 arrived and my perspective has changed! I am now open to teaching virtually and plan to do so again this fall. I am among those lucky ones who take a short walk to their office every day. Between Zoom meetings, teachings, Instacart and Amazon, and with my new coffee machine at home, I see my car as remaining mostly parked in the near future.

So here is where EUVL come into this picture. This change to remote communication, e-commerce and a virtual world is powered by Moore's Law – which enables the continuous and orderly growth of computational power that is the backbone of our new virtual world. Via our phones and laptops and tablets, we are connected to a network of powerful computer servers, which continue to grow in their power every year. Without these computers, we would not have this virtual world as we know it. The continuation of Moore's Law, which is ongoing miniaturization of transistors to boost their power, is now being enabled by EUVL. Your latest phones will be powered by EUVL, and so will your laptops and servers. I am happy to see EUVL being one of the enablers of advanced technology.

EUVL Short Course Moves Online

This year we are delighted to bring the EUVL Short Course online, which gives us an opportunity to offer this course to a much larger audience. I have been teaching this EUVL Short Course in person with Patrick Naulleau of CXRO and Jinho Ahn of Hanyang University for over 12 years in SPIE and in the EUVL Workshop. So this is something new, and it's perfect for the present environment.

I will start the Short Course with an introduction to EUVL, and will give an historical perspective to EUVL and describe EUV sources and metrology. I will also end the Short Course with a review of the status and challenges of EUVL technology. Dr. Patrick Naulleau will cover several topics in the EUV optics, system, patterning and resist session. Included will be EUV patterning capabilities and extendibility, current status of



EUV resists, EUV resists extendibility, and shot noise. Lastly will be the EUV mask session taught by Prof. Jinho Ahn. In this session, he will cover EUV mask structure and process flow, mask substrate, multilayer mirror deposition, absorber stack and pattern fabrication, mask inspection, metrology and repair, mask contamination protection and cleaning, and advanced mask structure for better imaging.

I look forward to seeing you in our virtual classroom! Please visit www.euvlitho.com for registration and for additional information about the Short Course.

