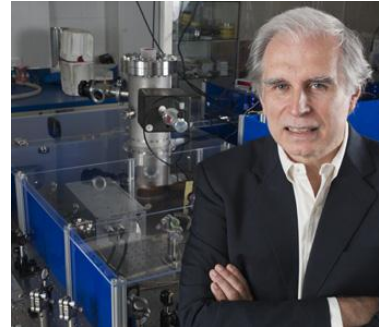
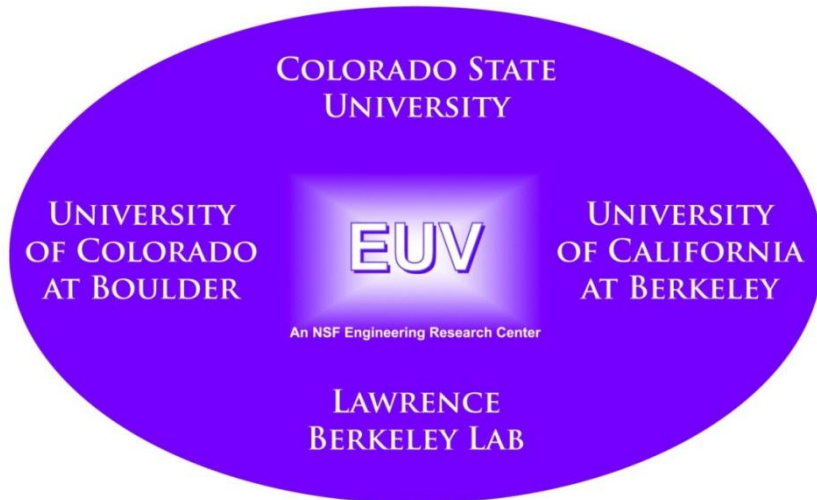
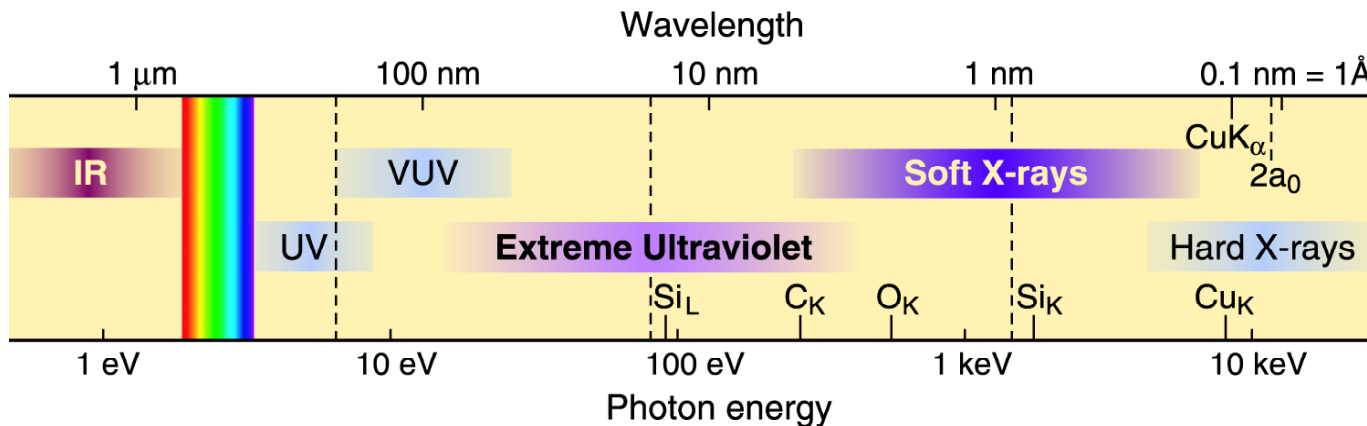


Engineering Research Center for Extreme Ultraviolet Science and Technology



Jorge Rocca and Carmen Menoni
Colorado State University



Host University for the multi-institutional ERC

- Business management and services
- IP management through CSURF
- Financial Support

New laboratories under construction next to our current facility on the Foothills Campus, scheduled for completion later this year.

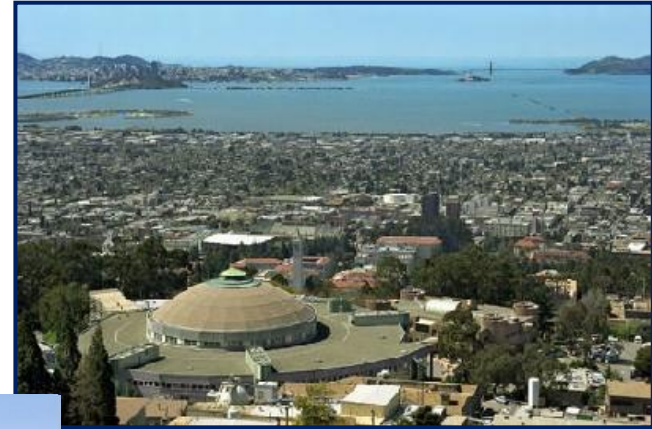


What we do ...

Sources of EUV – EUV/X-ray “Light Factories”



Berkeley
Synchrotron



Free Electron
Laser Facilities

Fermi@Eletra ($\lambda=10-100\text{nm}$)



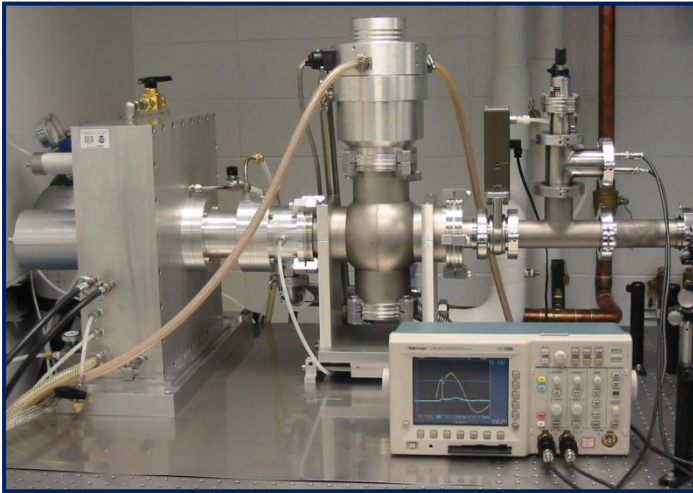
LCLS ($\lambda=0.15- 1.5 \text{ nm}$)



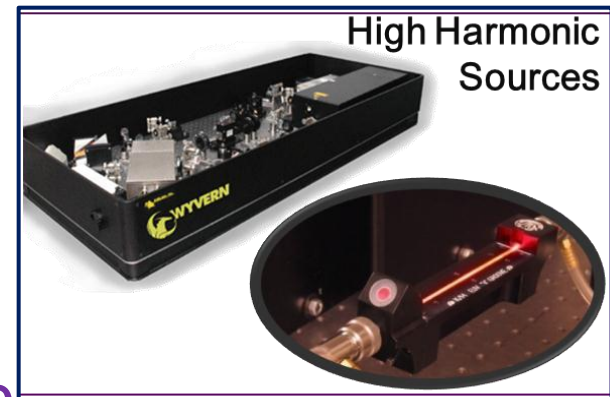
Single user facilities
Bring the experiment to the source

What we do ...

The vision of the EUV ERC is to *advance the technology of small-scale and cost effective coherent EUV sources and incorporate them into testbeds.*

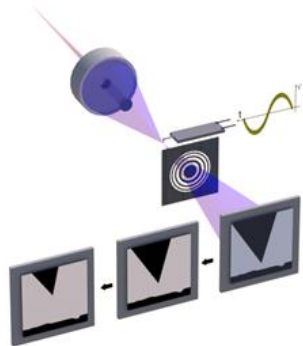


- Research
- Proof of concept
- Technology Demonstration
- Product/Process evaluation

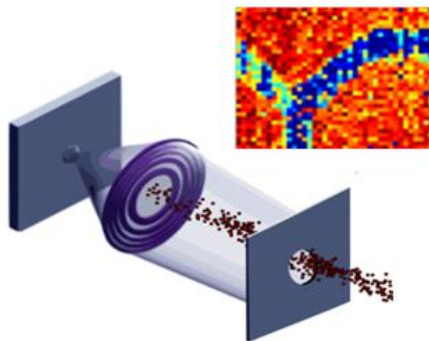


EUV ERC Testbeds

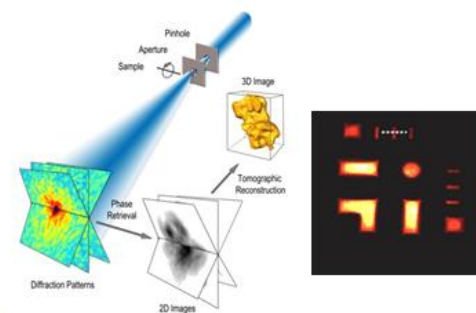
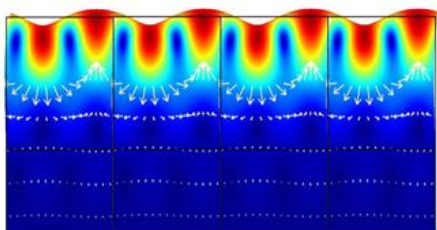
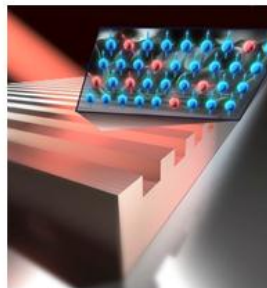
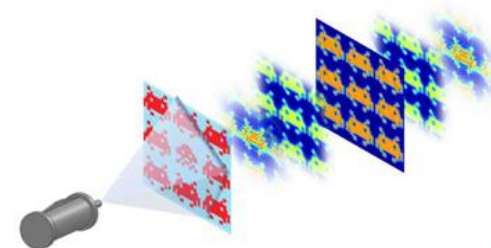
Nanoscale Movies



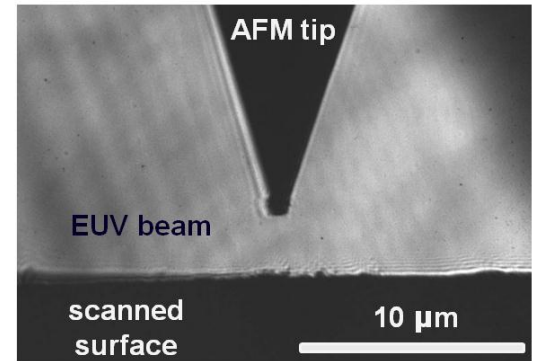
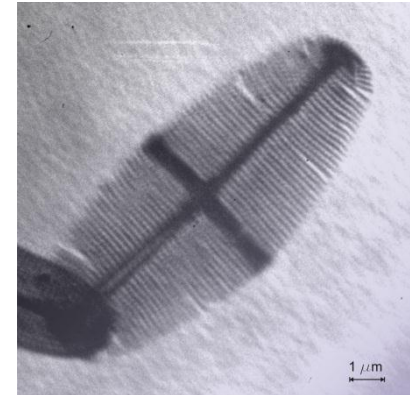
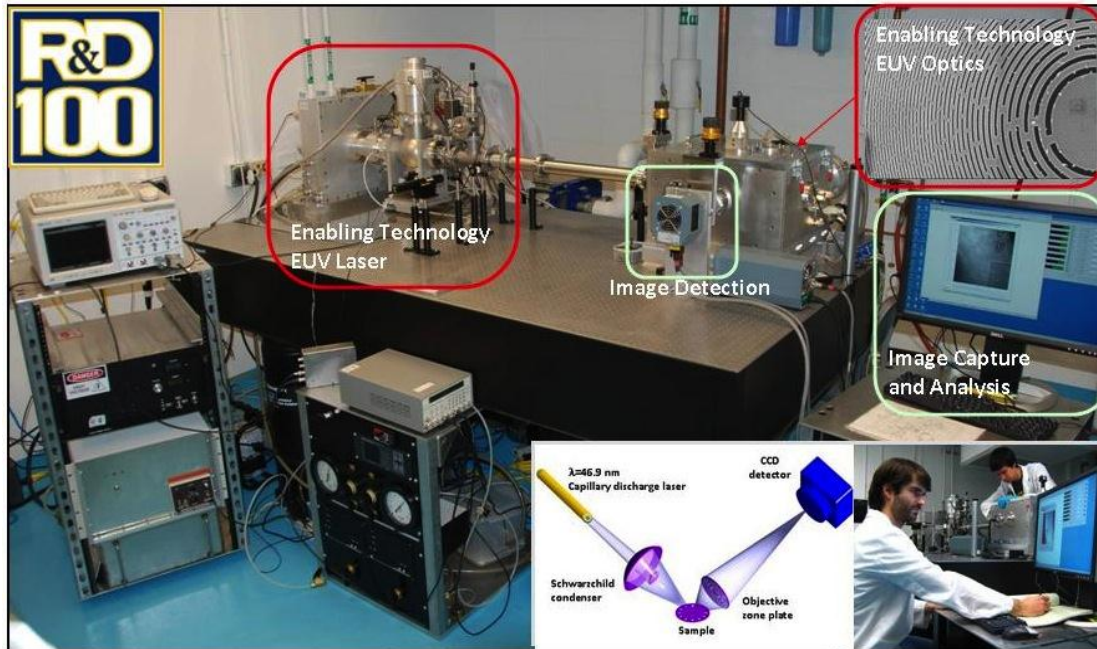
Analytic Nanoprobe



Nanoscale Microscopy

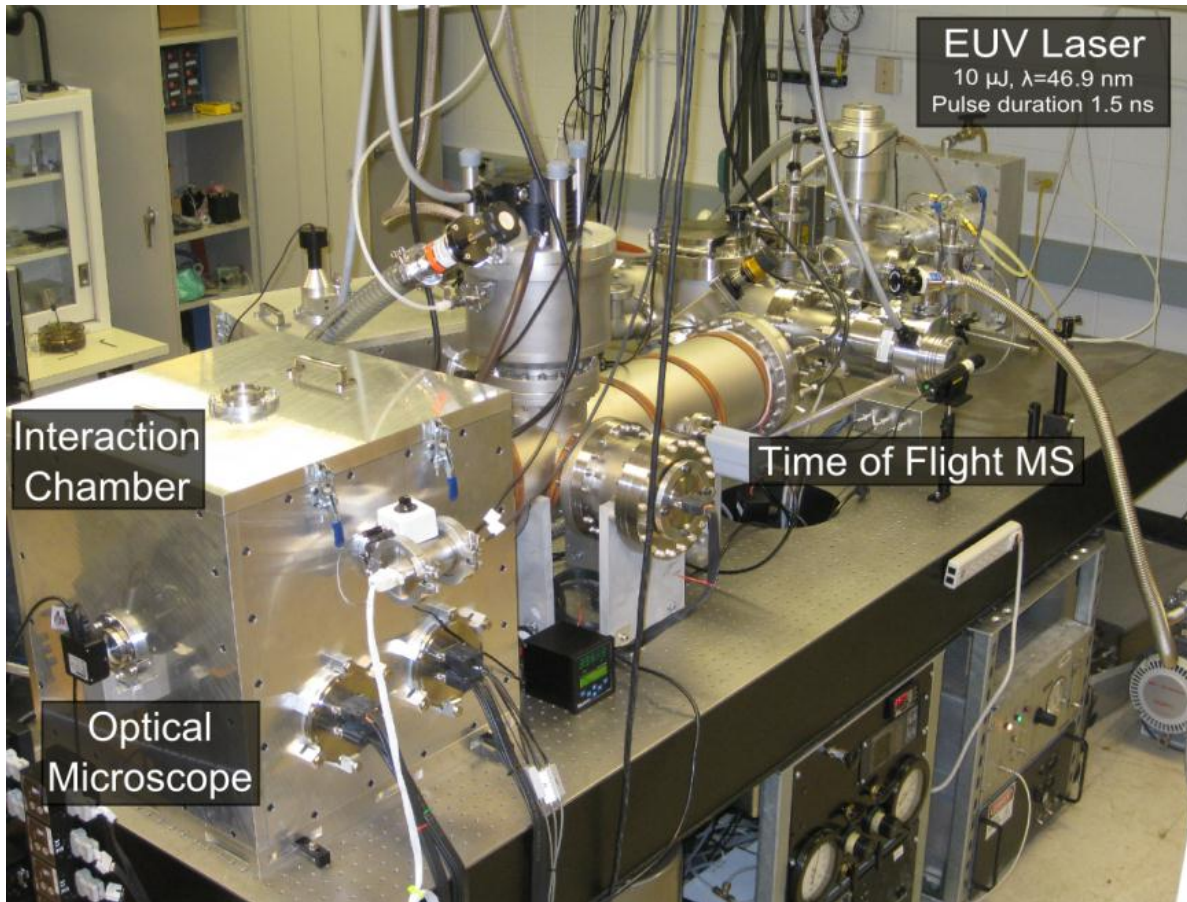
Nanoscale Materials
Metrology and Energy
FlowMagnetic Switching,
Spintronics, Speed LimitsError-free
Nanopatterning

EUV ERC Testbeds - imaging

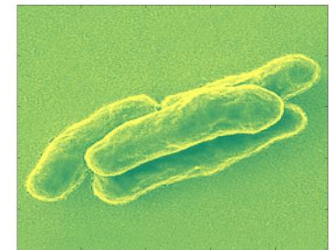


Substantially less preparation of sample
Capable of stop-action imaging

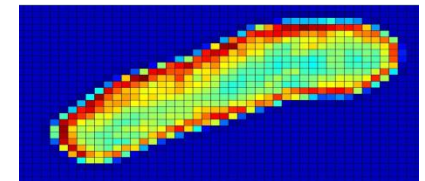
EUV ERC Testbeds – mass spectrometry imaging



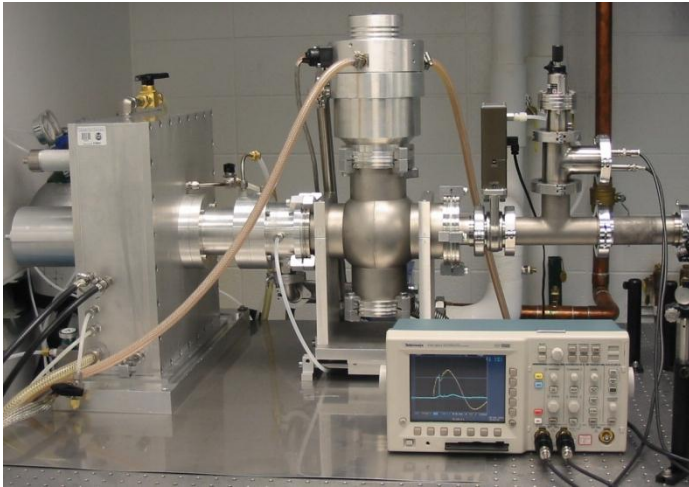
Bacilli *M. tuberculosis*



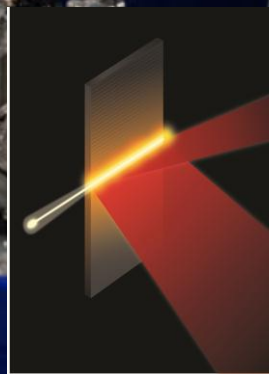
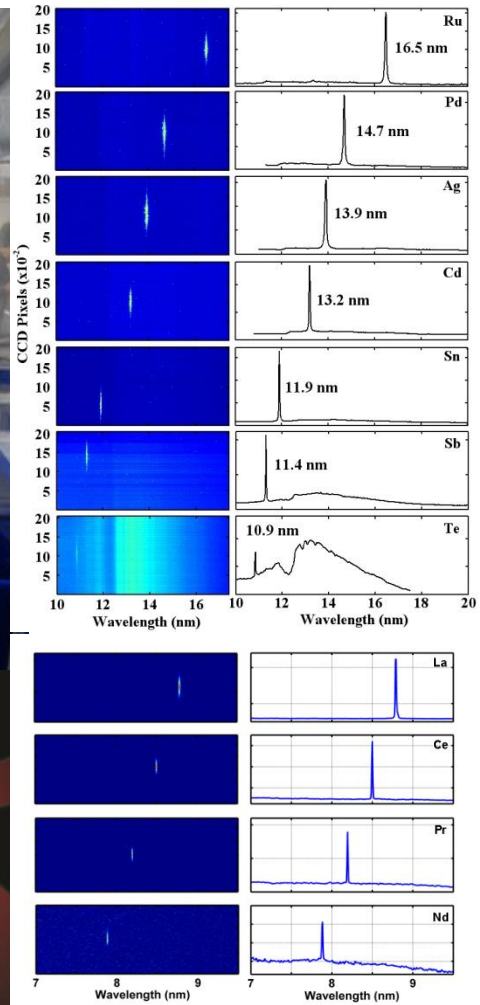
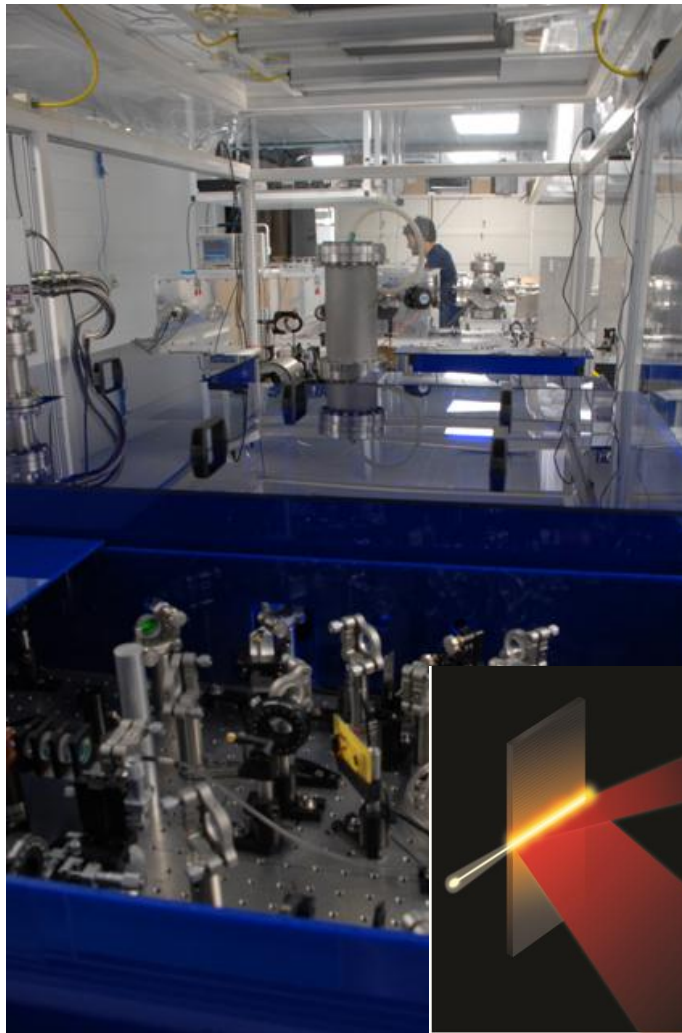
Mass spectrometry
image of *M.*
tuberculosis bacillus



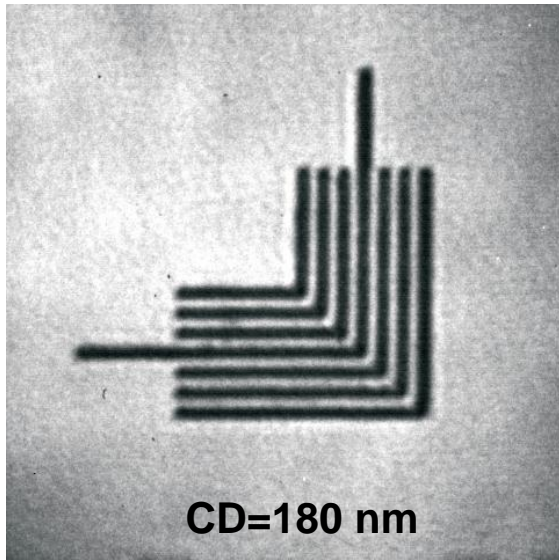
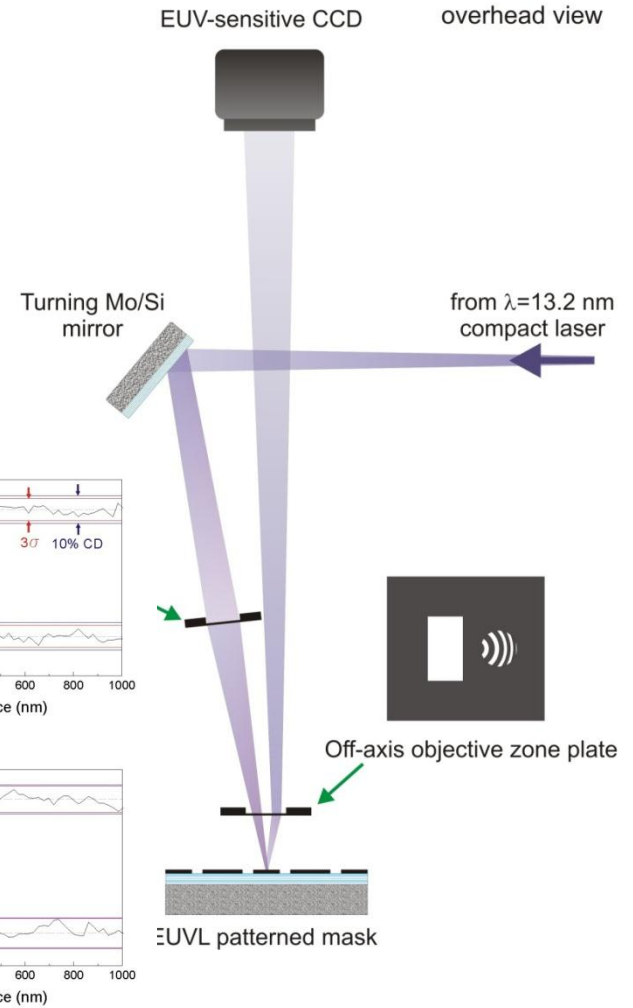
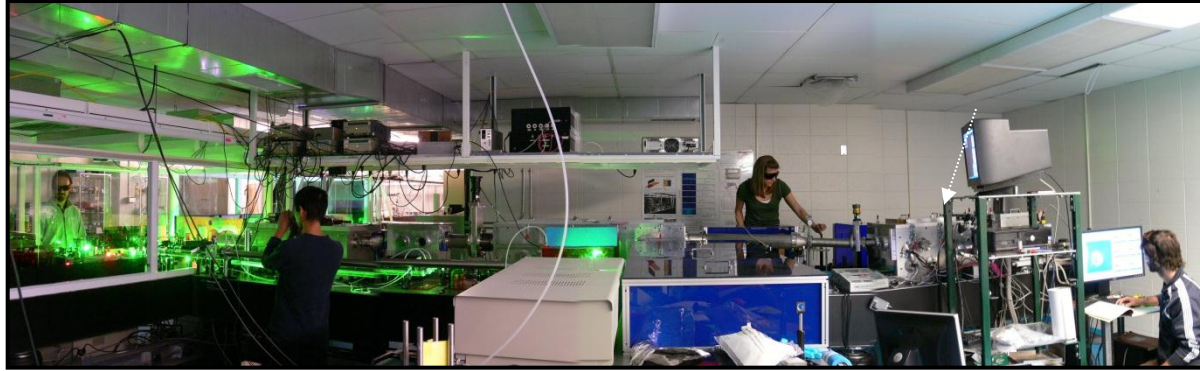
Compact capillary discharge $\lambda=46.9$ nm Lasers



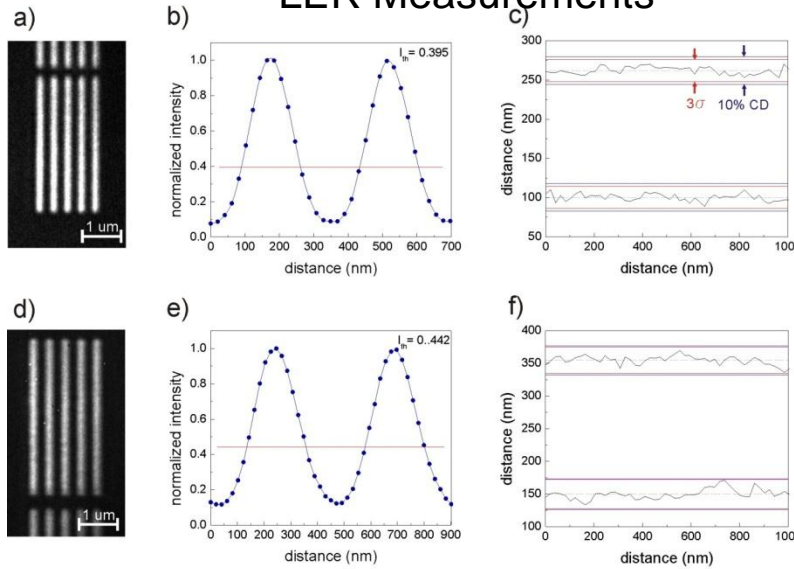
Laser-plasma based EUV lasers Gain saturated $\lambda= 32.6$ nm- 8.8 nm



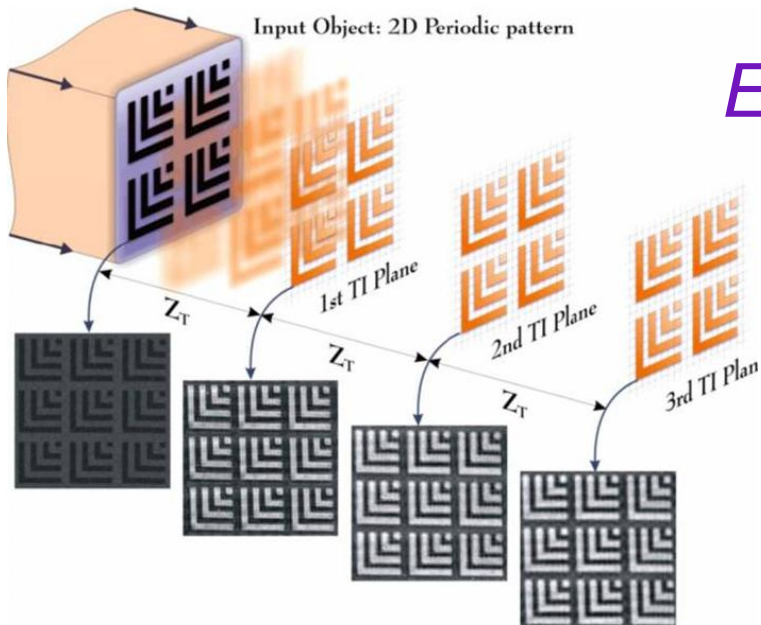
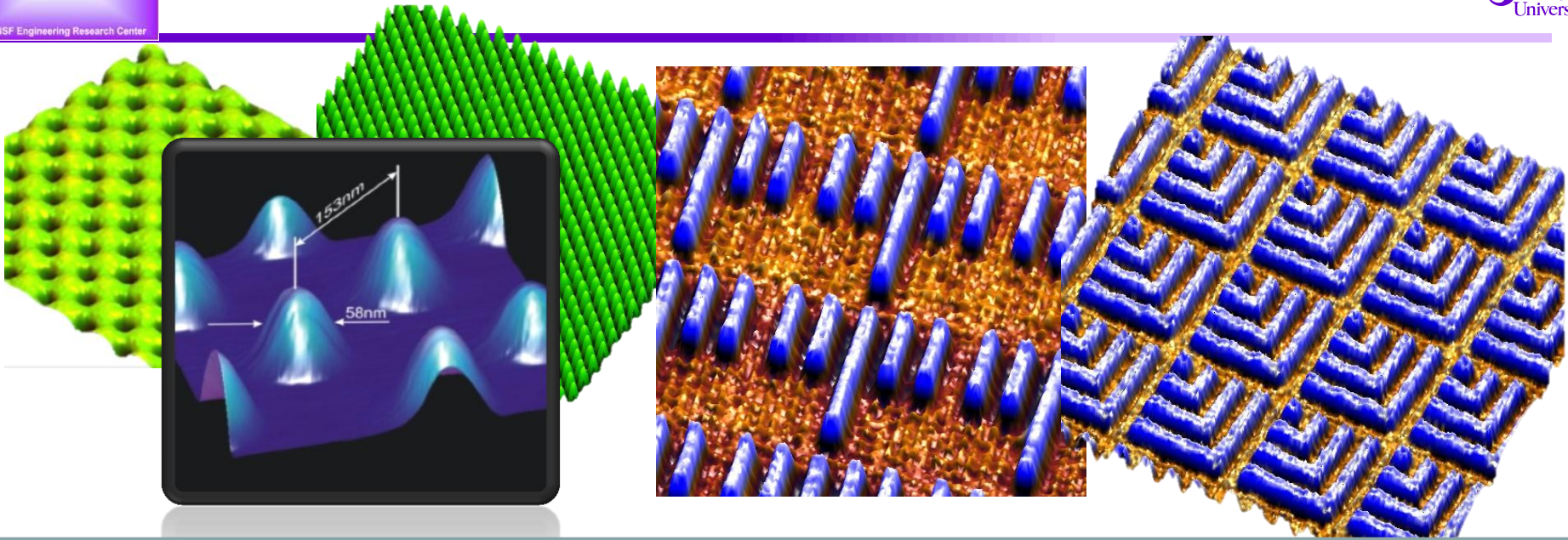
13.2 nm laser-based microscope for defect inspection of EUV lithography masks



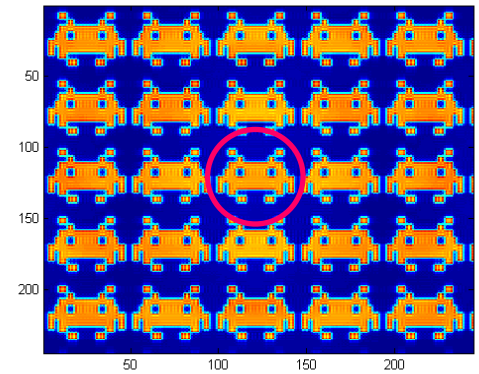
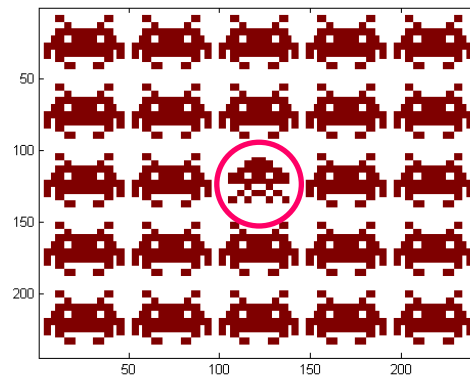
LER Measurements



EUV Optics from CXRO, Berkeley



Error free Talbot printing



Laboratory Tours



**UNDER
CONSTRUCTION**

