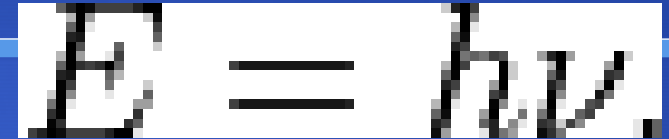




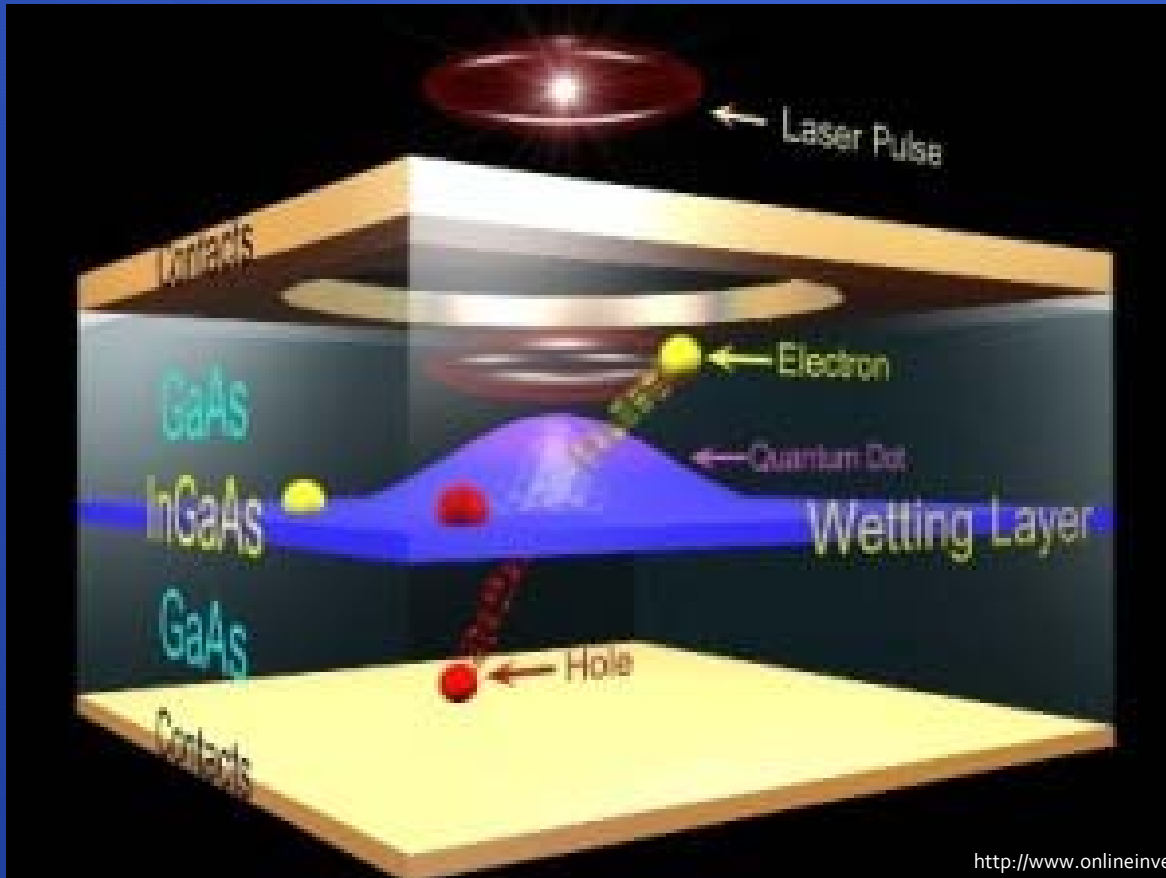
Quite Delightful  
Qualitative Discoveries  
of  
Quantum Dots

Deborah Tien  
Sih Lab  
U. Of Michigan  
REU 2010

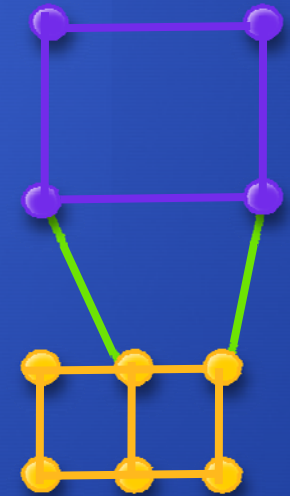
# What is a Quantum Dot?



- A small dot!

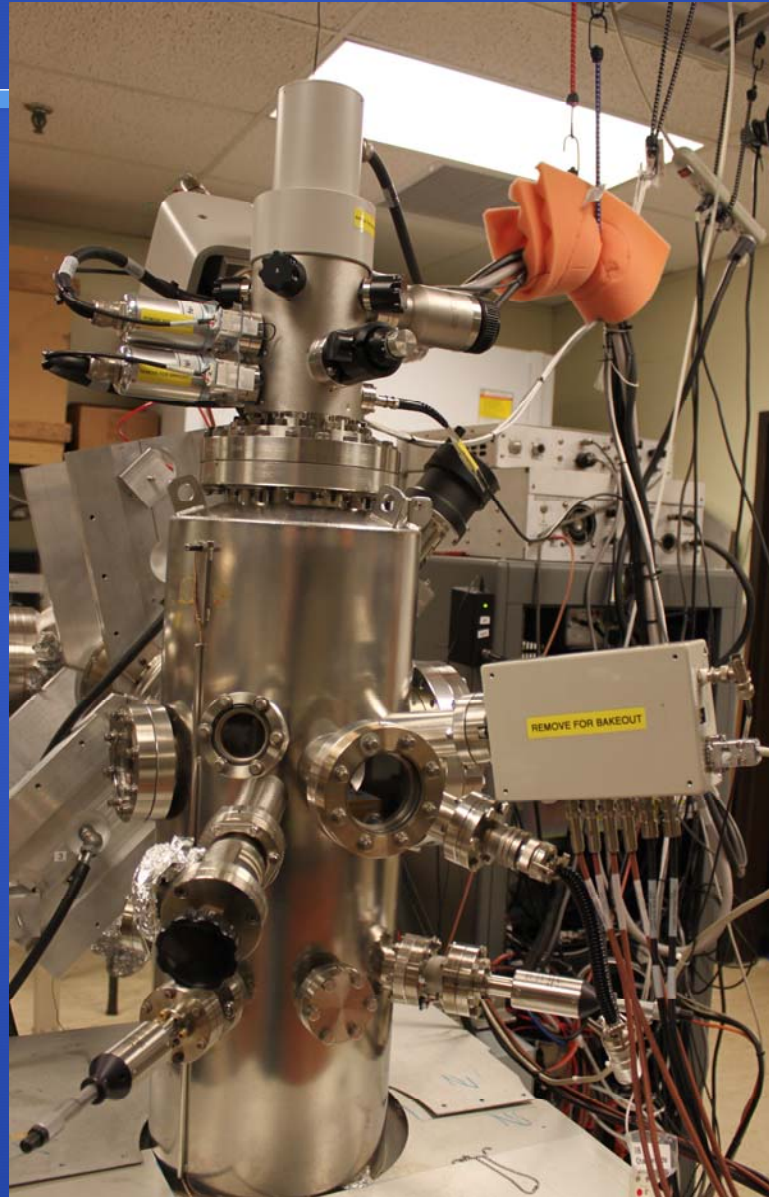


InAs

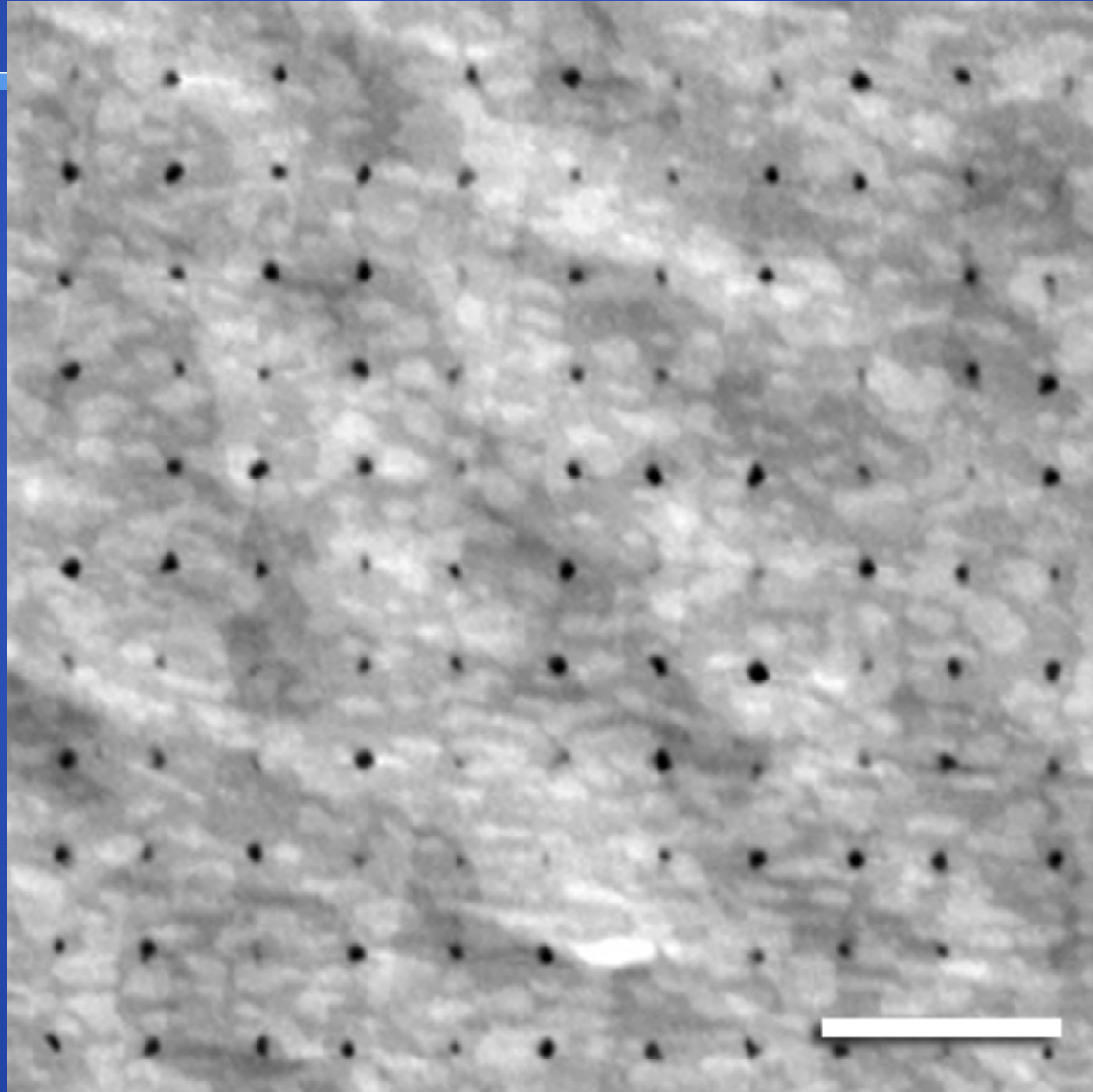


GaAs

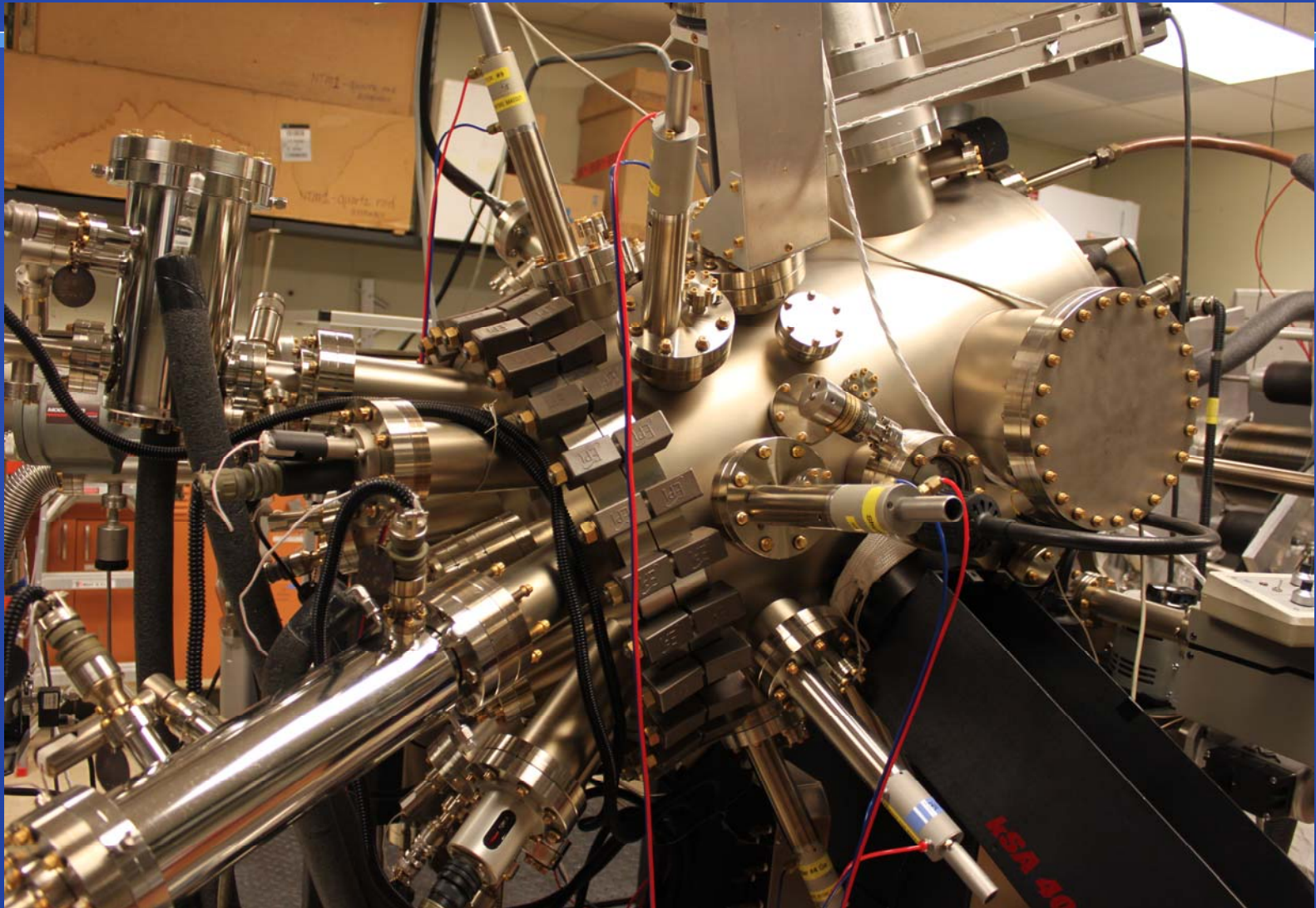
# Focused Ion Beam



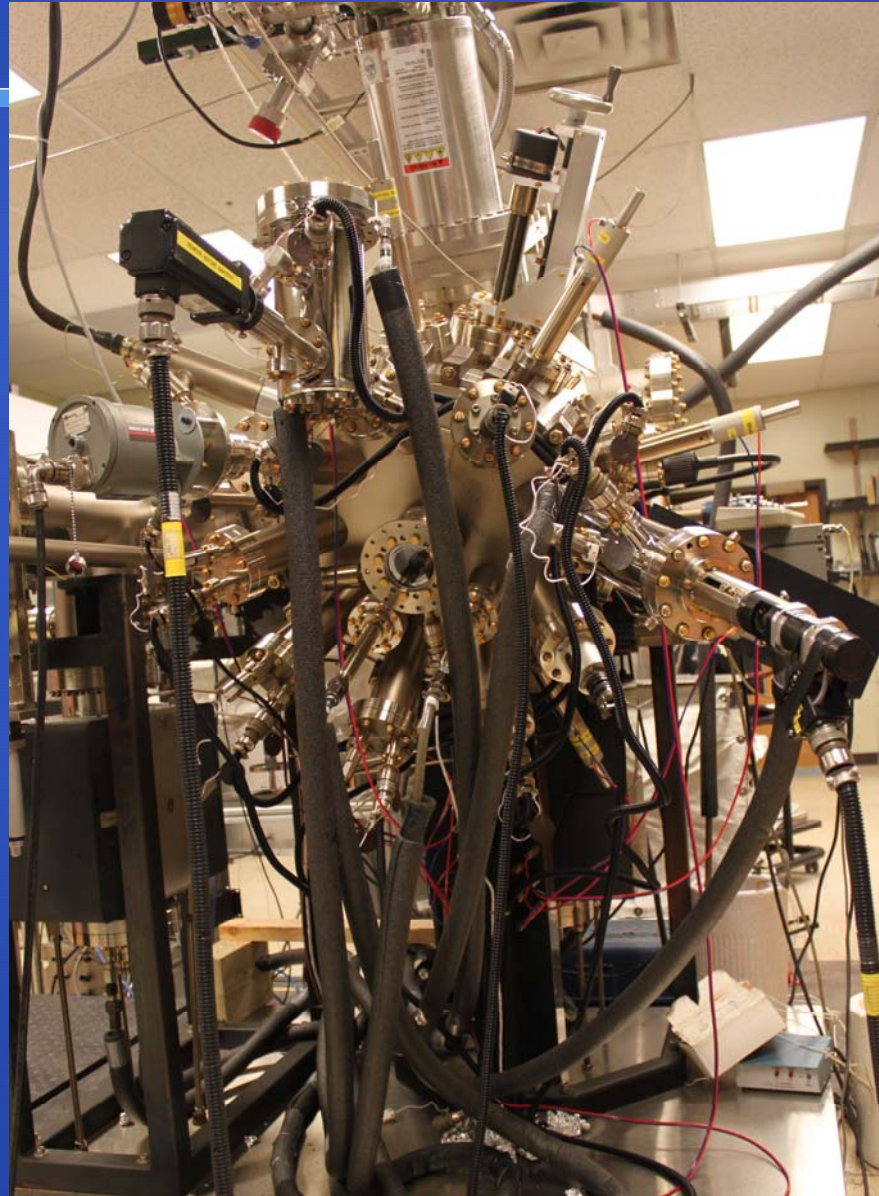
# Holes



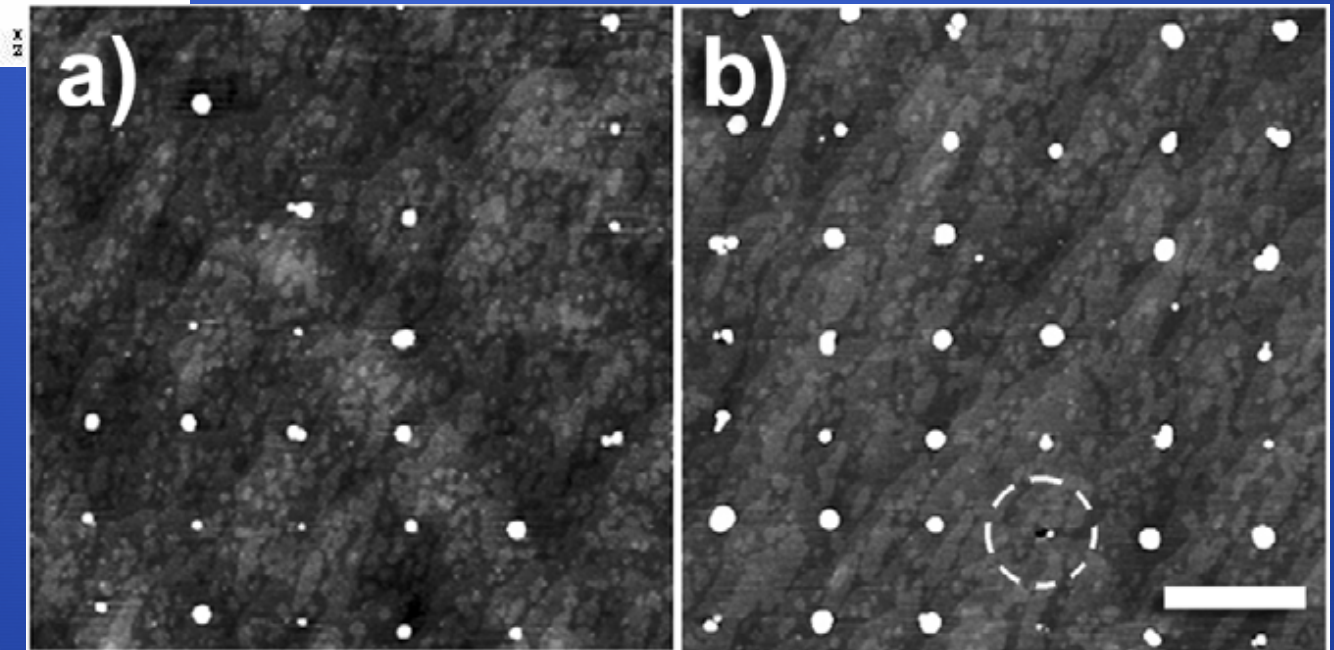
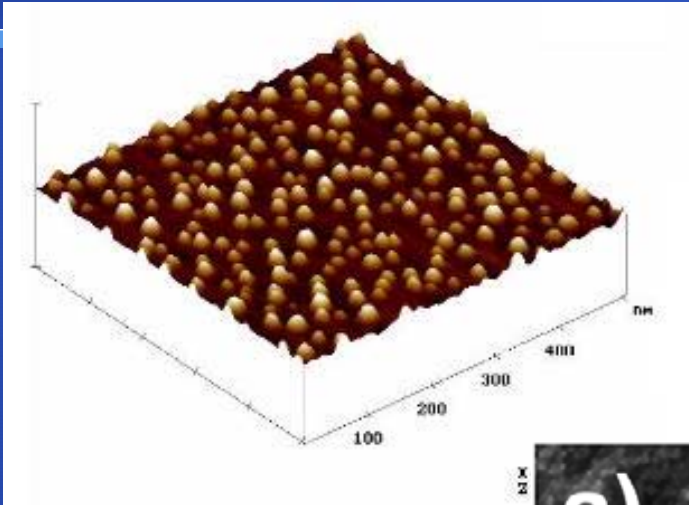
# Molecular Beam Epitaxy



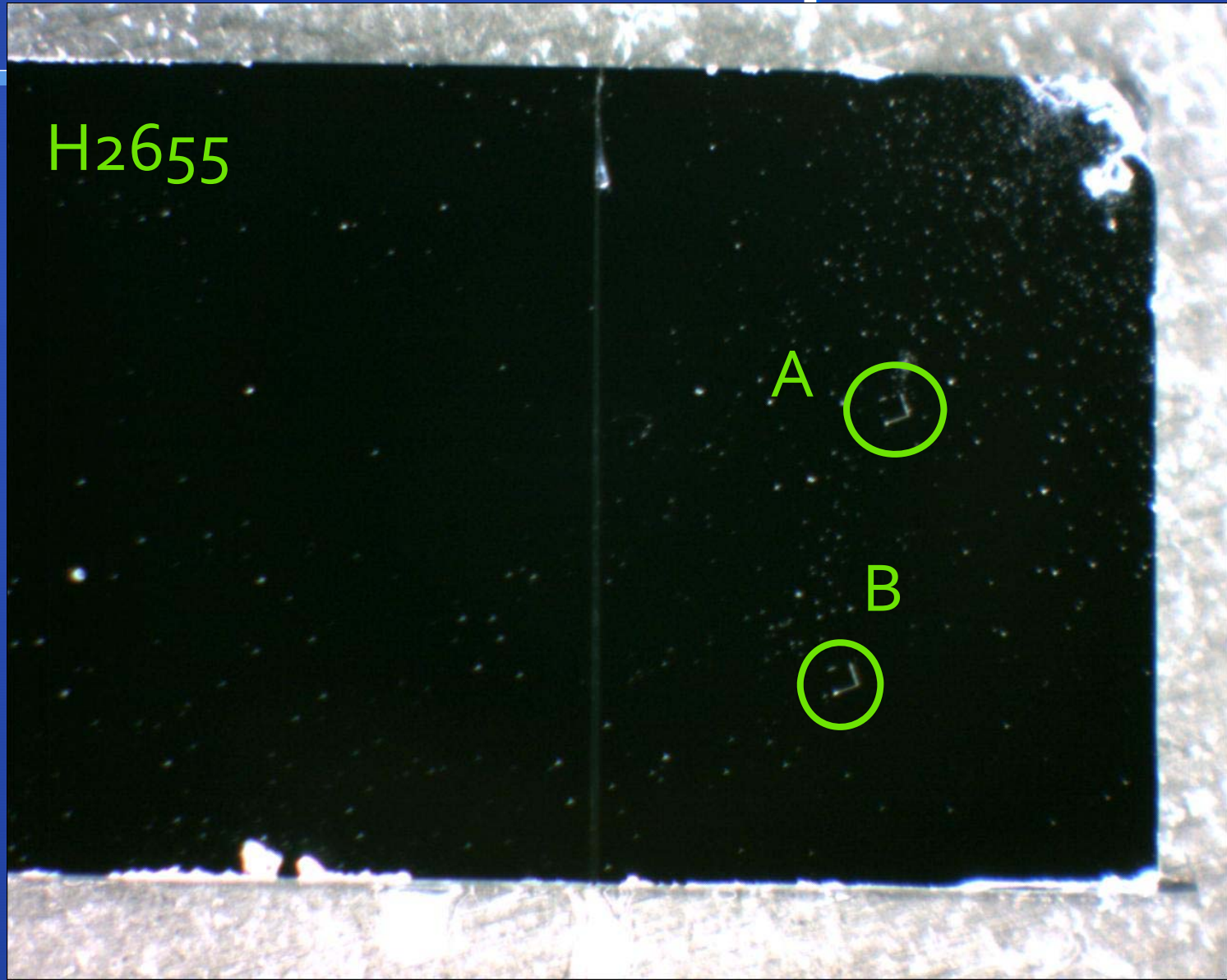
# MBE



# Comparison

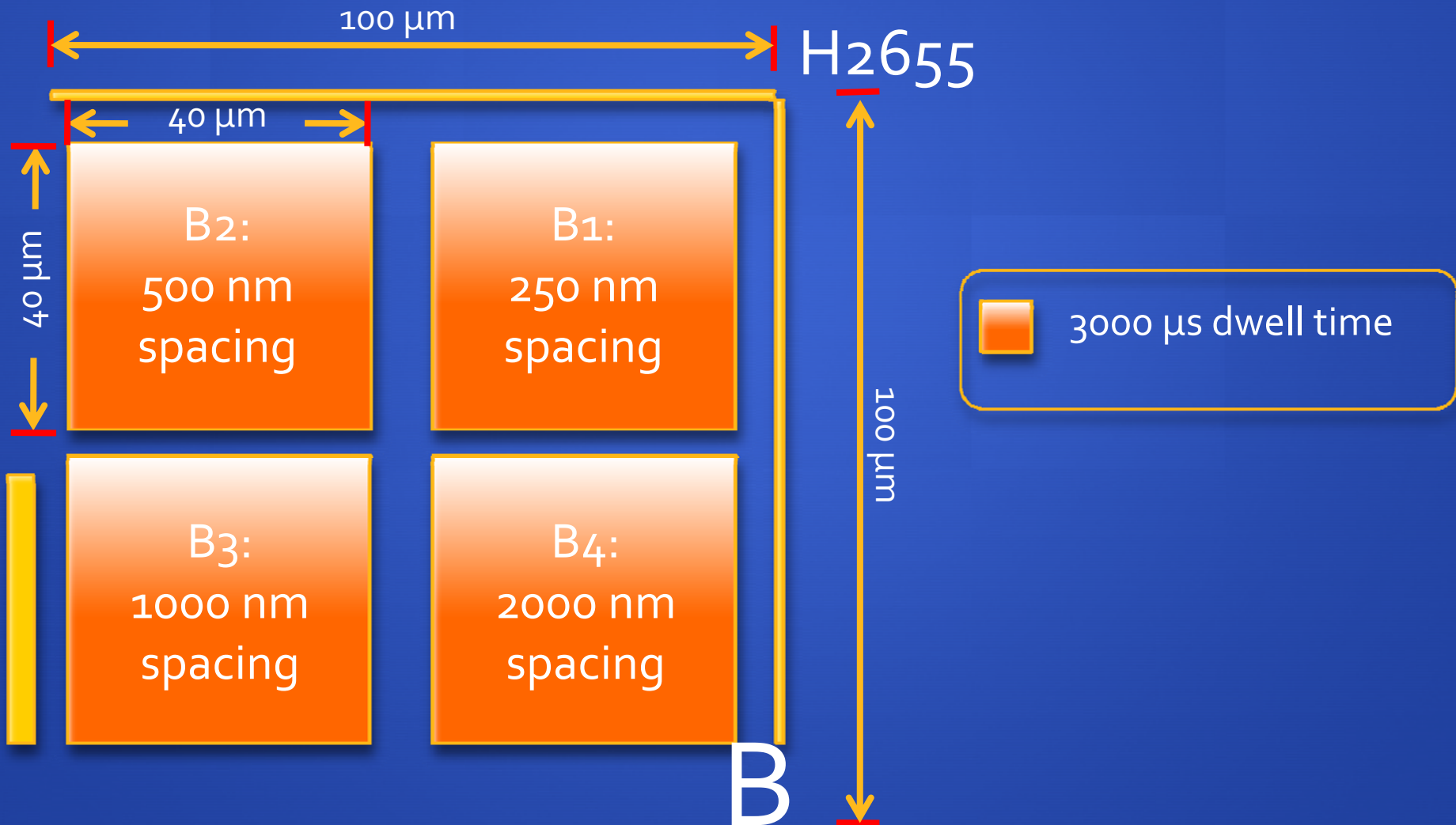


# Actual Sample



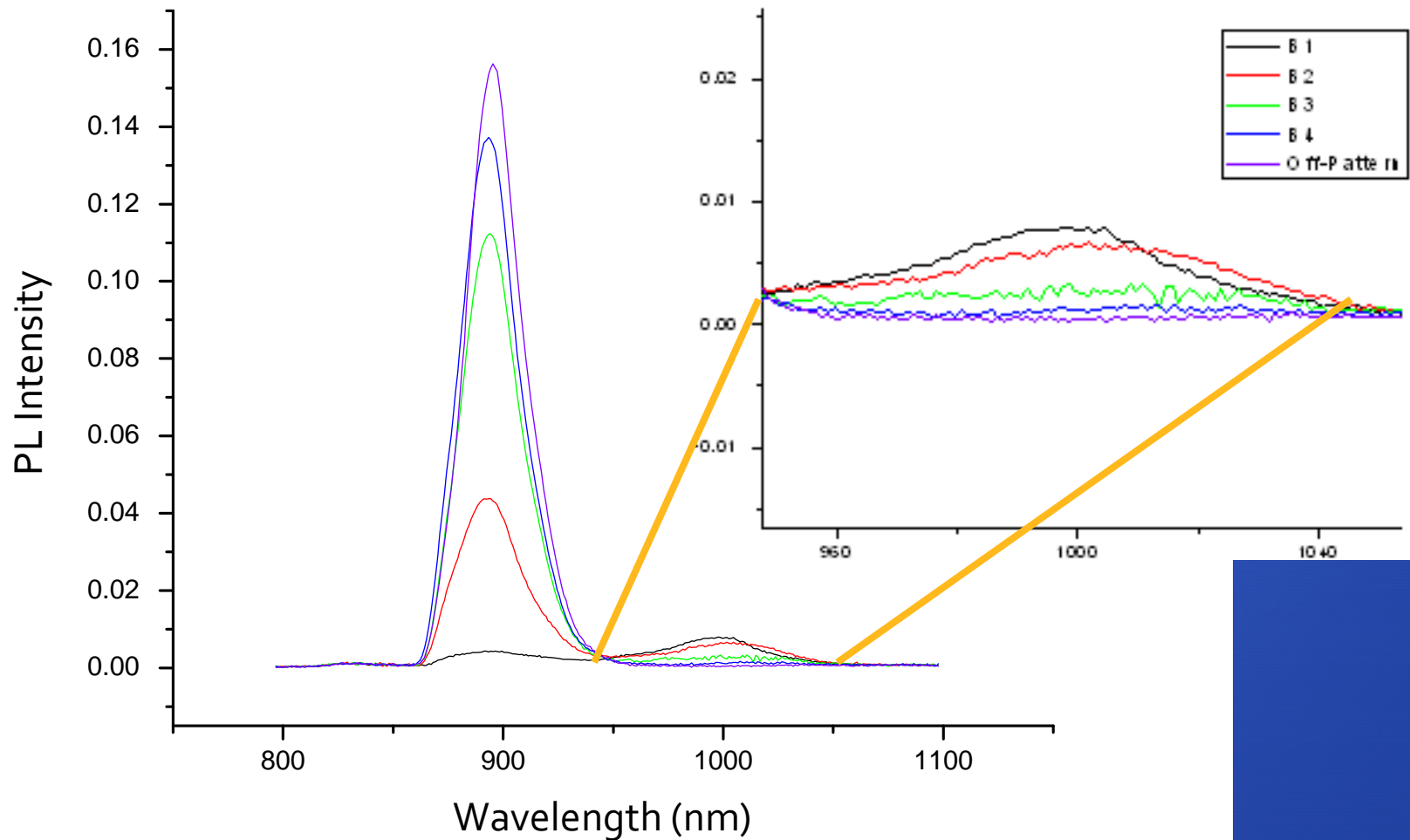


# Sample Layout Example



# Macro Photoluminescence

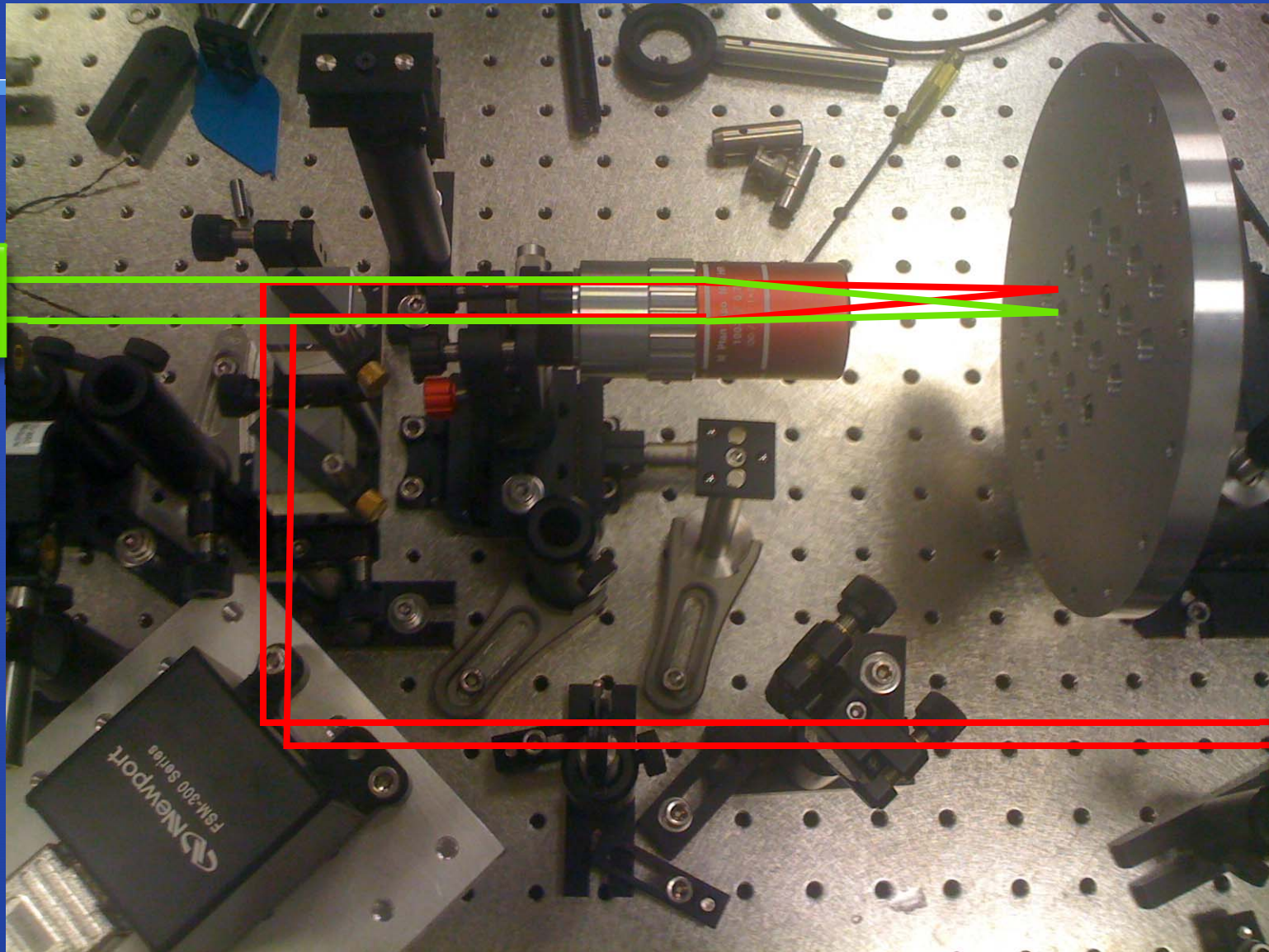
H2656\_HeNe\_38.7uW\_wLP\_wolris\_30K\_TC1s\_Scan2\_slit1mm.dat



# Old Set Up

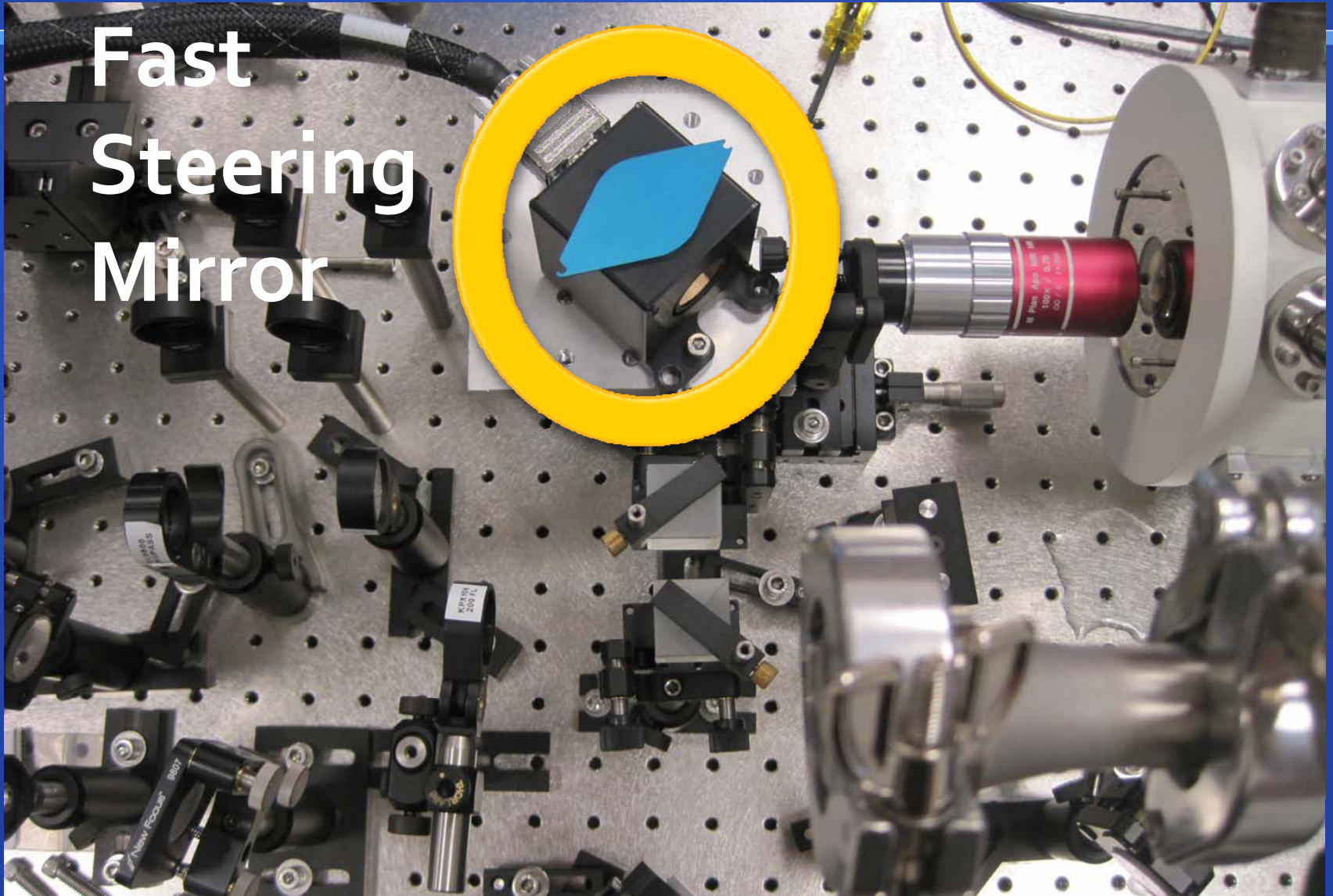
CCD

Laser

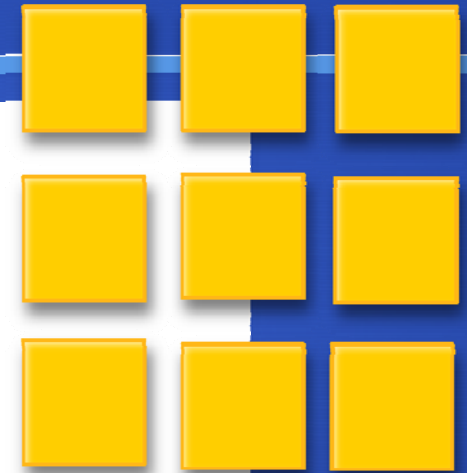
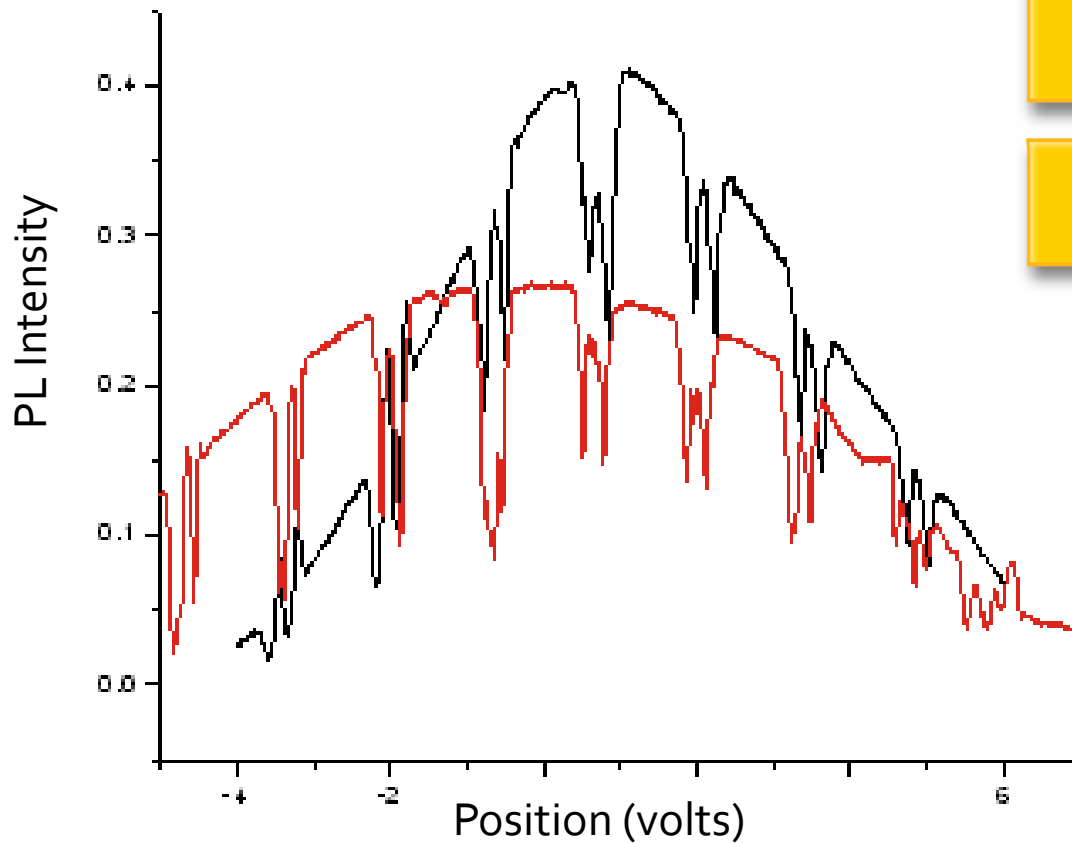


# NEW SET UP

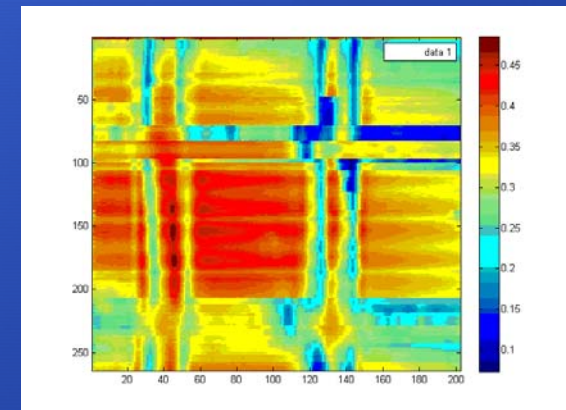
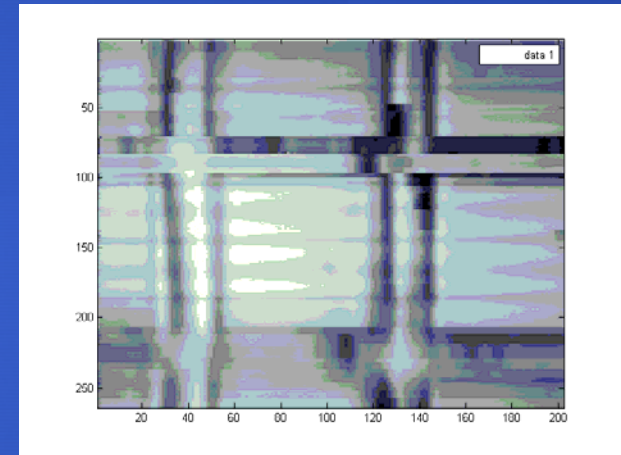
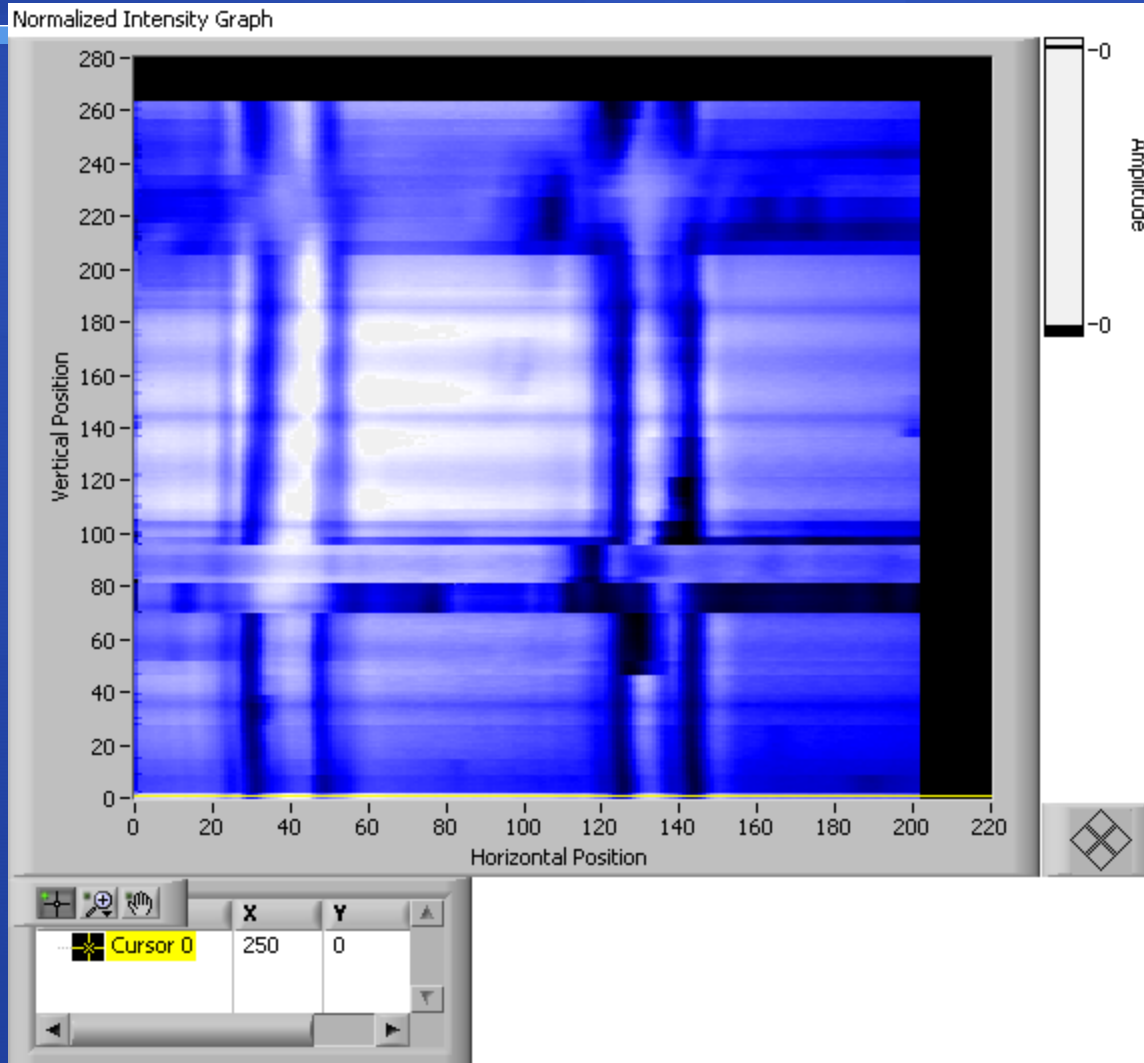
Fast  
Steering  
Mirror



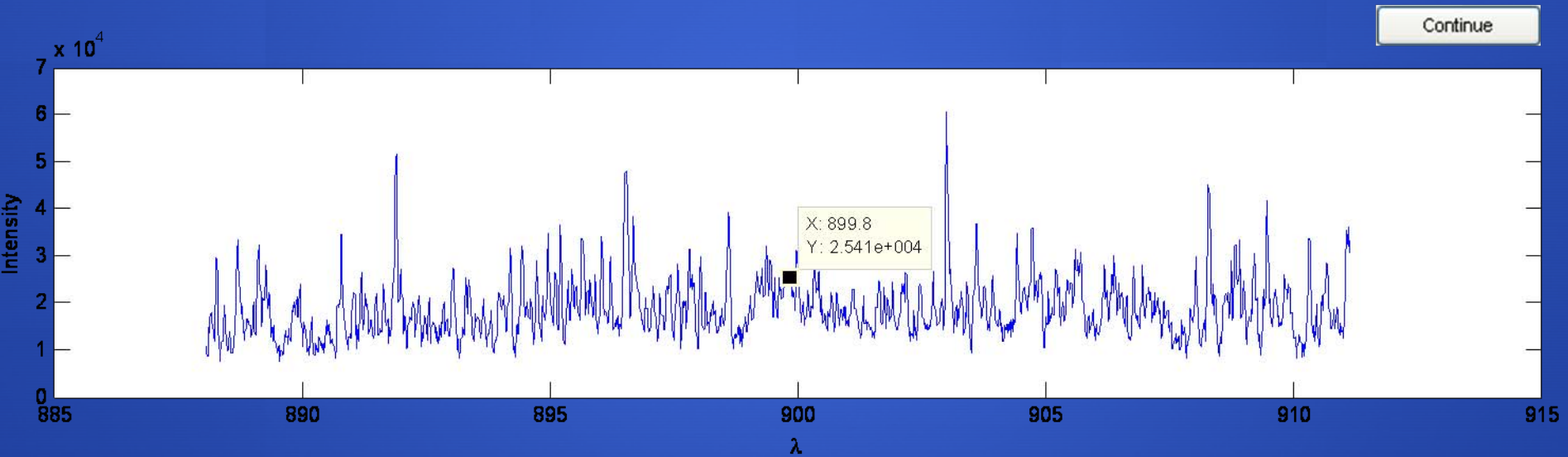
# Results of New Setup



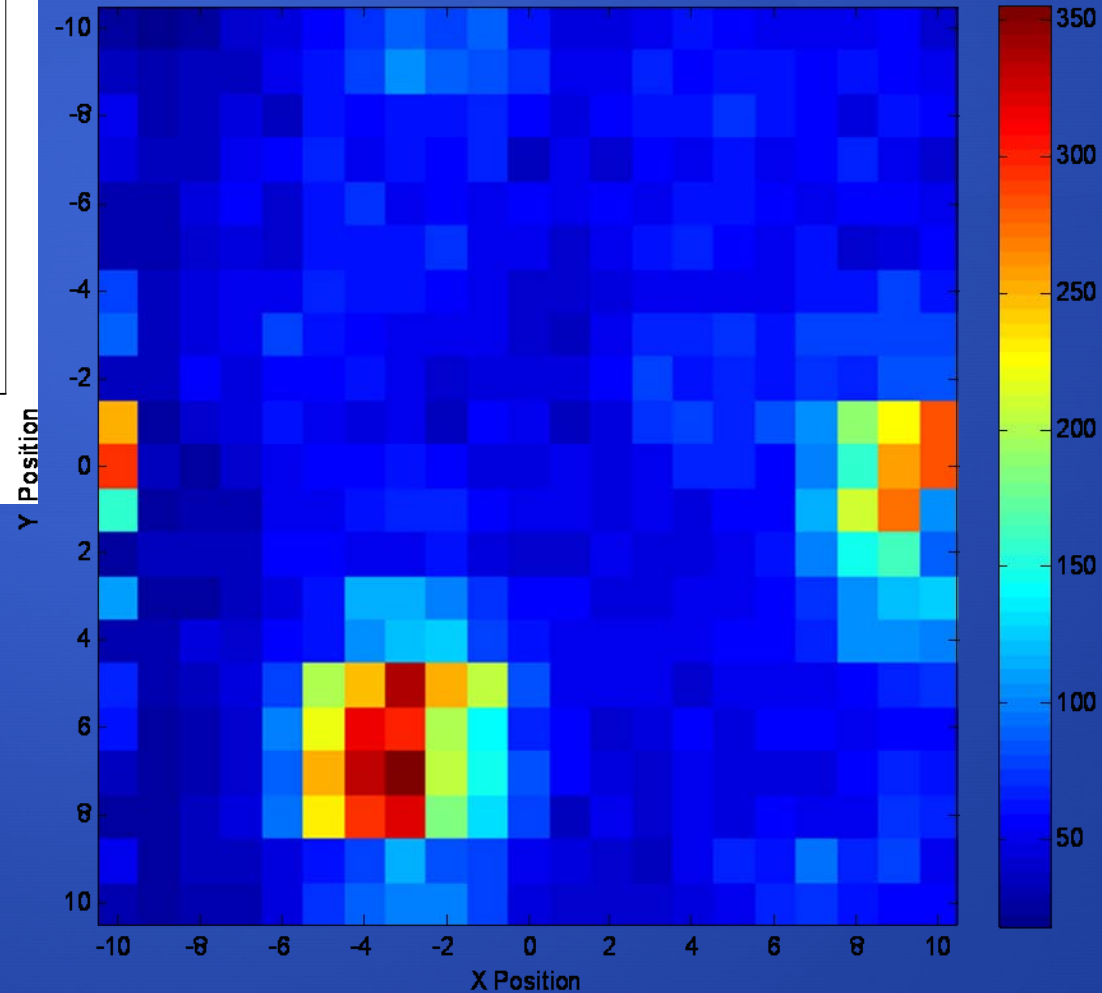
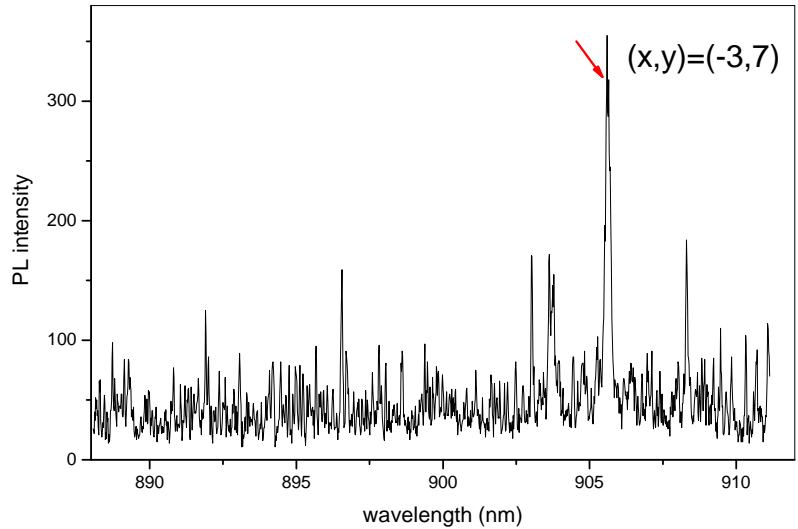
# Results of New Setup



# Sample MicroPL Spectrum



# 2-d Spatial Scan

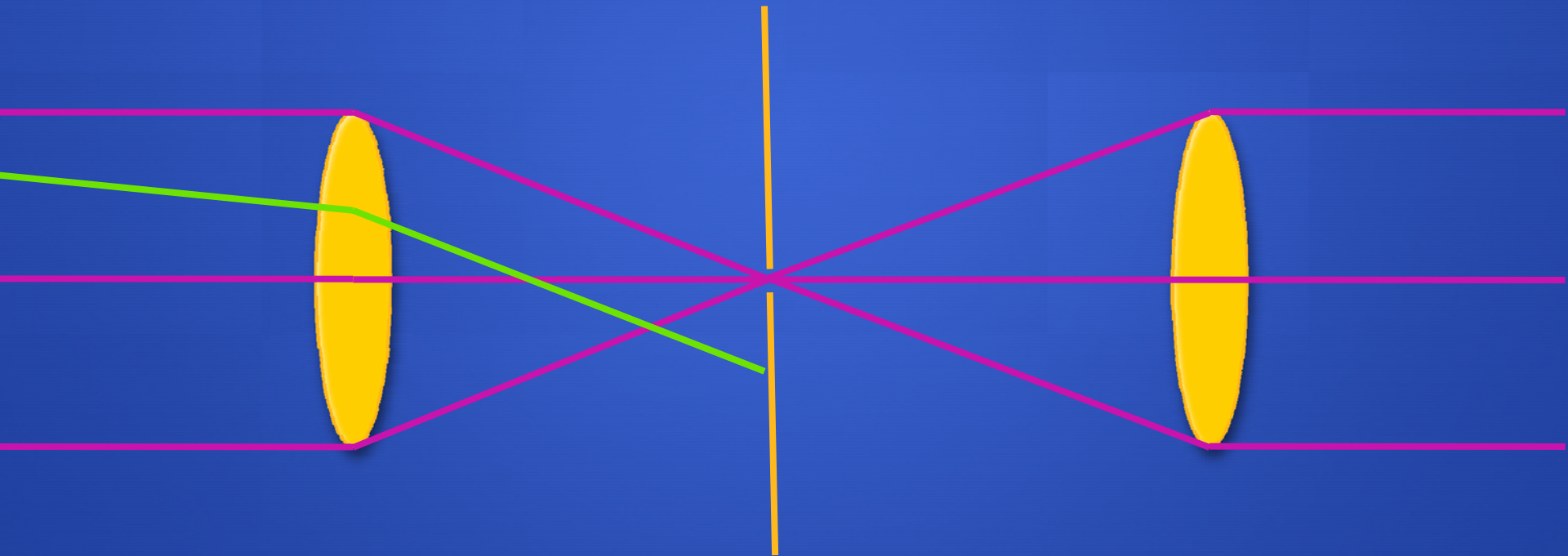




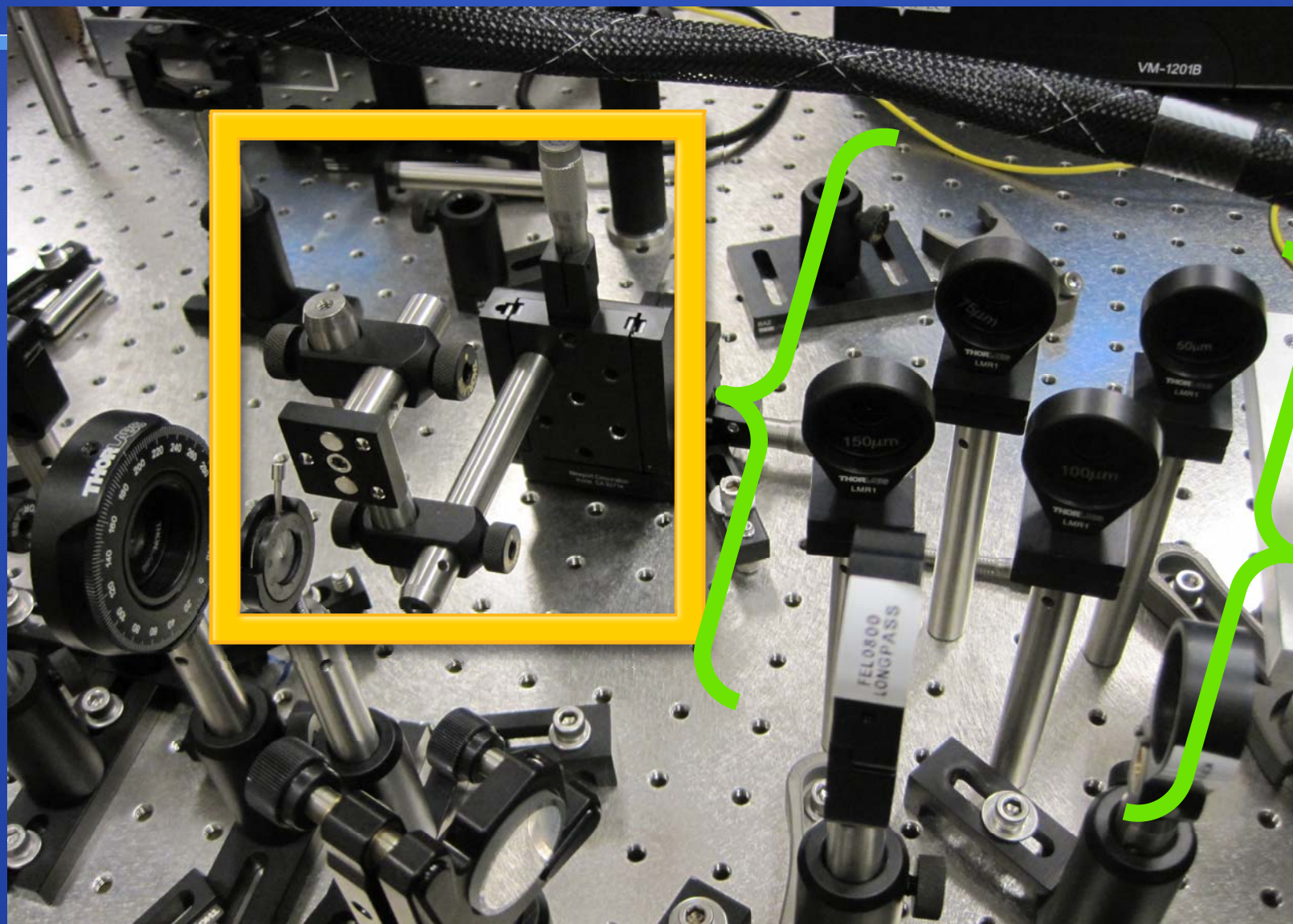
# Confocal Microscopy



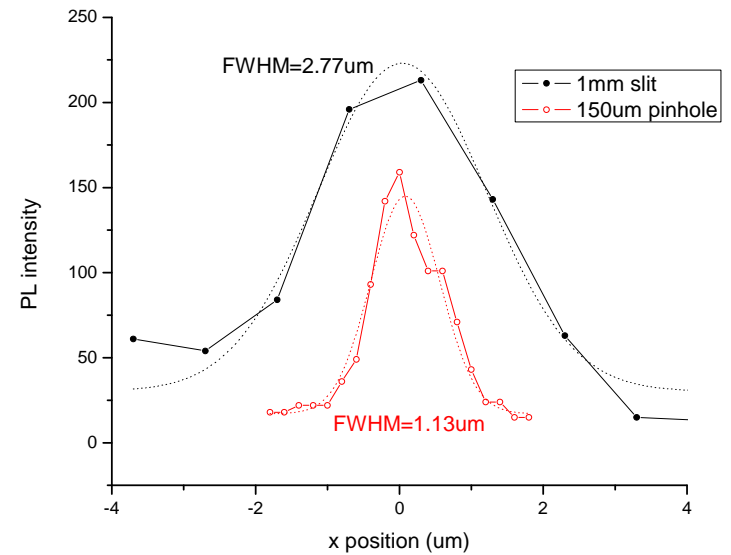
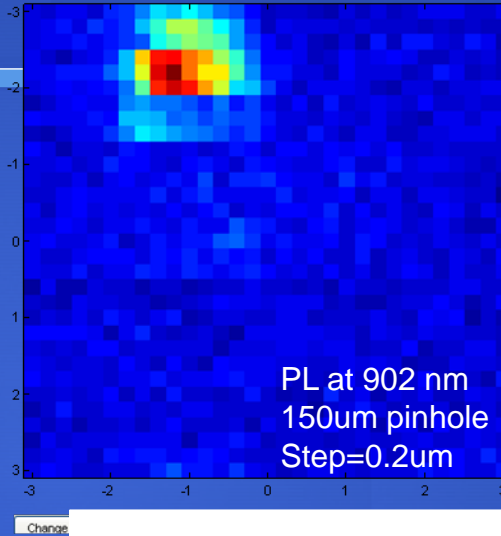
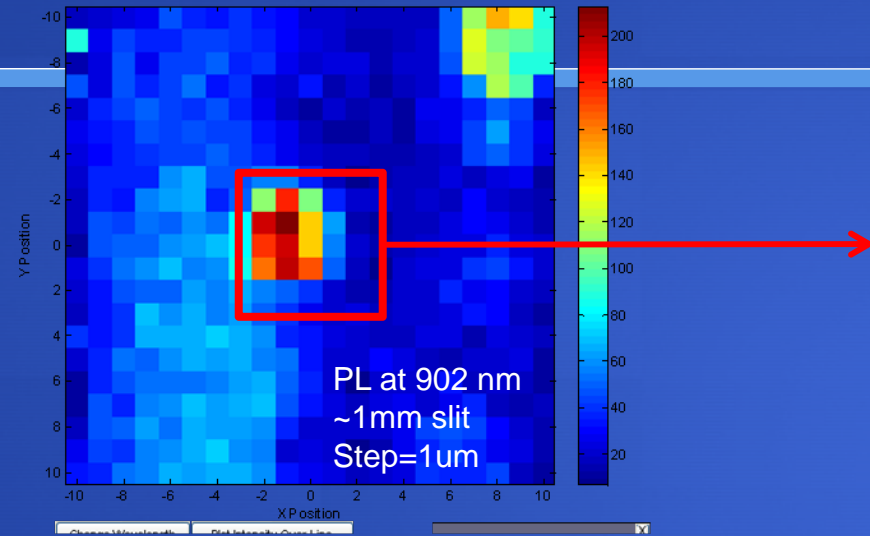
# Confocal Microscopy



# Pinholes



# Pinhole Resolution





# THANK YOU

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- U. of Michigan for offering me this opportunity to broaden my physics research experience.
- National Science Foundation for supplying the funds to sustain my need to go shopping.
- Vanessa Sih for allowing me to work with her and patiently answering my rather basic questions.
- Jieun Lee for taking time to explain things (concepts, procedure, etc.) to me and understanding the need for as much extra sleep as possible.

# THANK YOU

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- Chris Trowbridge and Ben Norman for always making sure I had goggles when the other laser was on.
- Andy Martin and Joanna Millunchick for creating the samples, without which none of this research would've been possible.
- Jim Liu for arranging this faaantastic program.
- Greg Tarle for hosting us on our first night.

# THANK YOU

---

- Stephanie Mize for taking us out on the most wondrous lunches. Ever.
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- The Ride for being free with an M-Card.