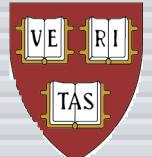


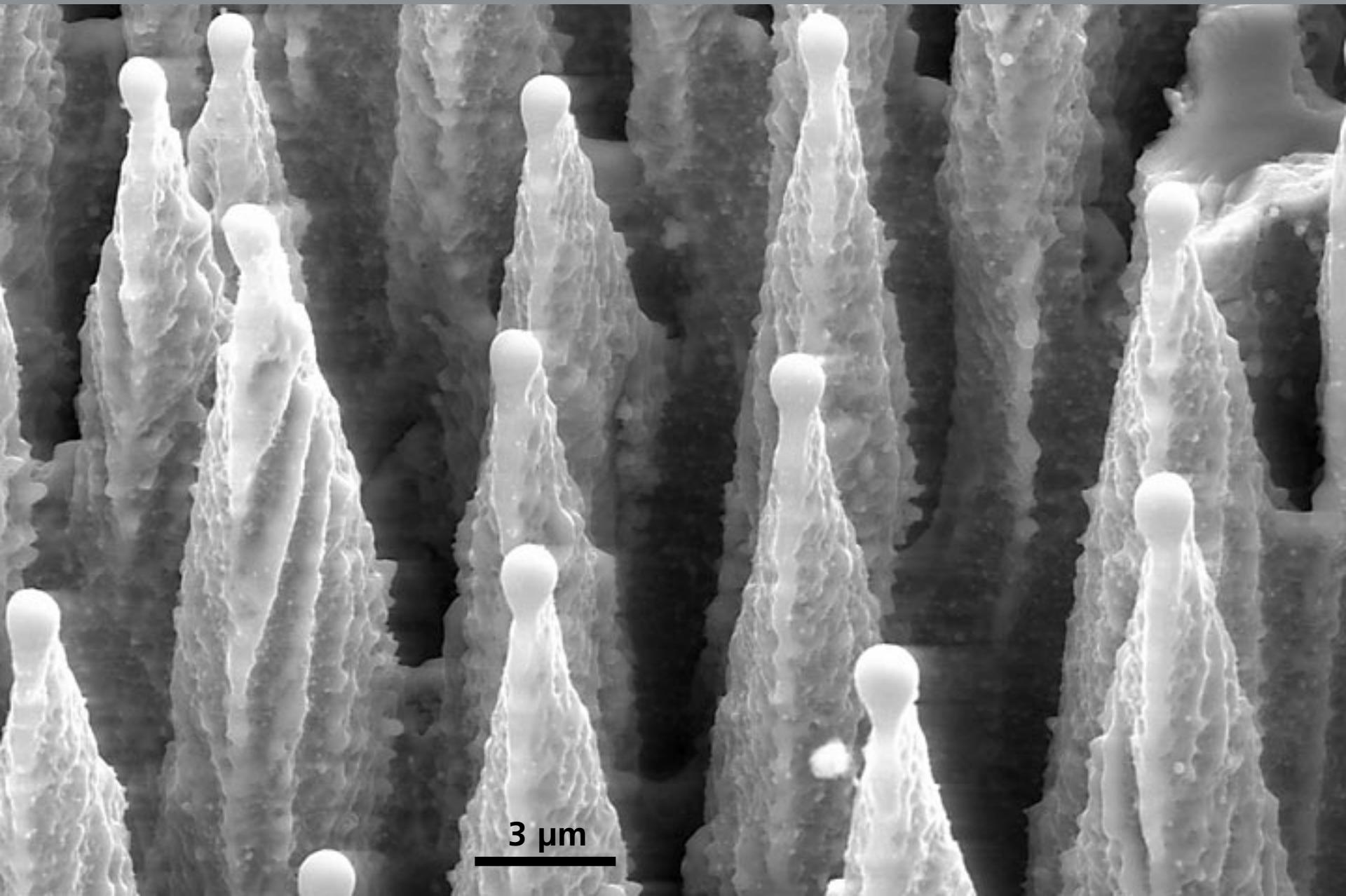
Visible luminescence of silicon microstructures fabricated with femtosecond laser irradiation

**Jim Carey
Harvard University**

**NATO Advanced Summer Institute, Erice, Italy
Spectroscopy of systems with confined spatial structures
23 June 2001**

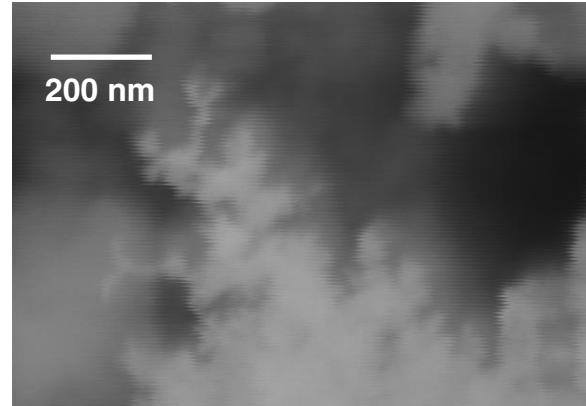
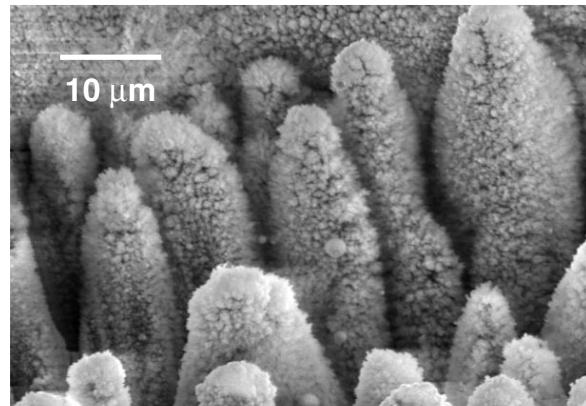
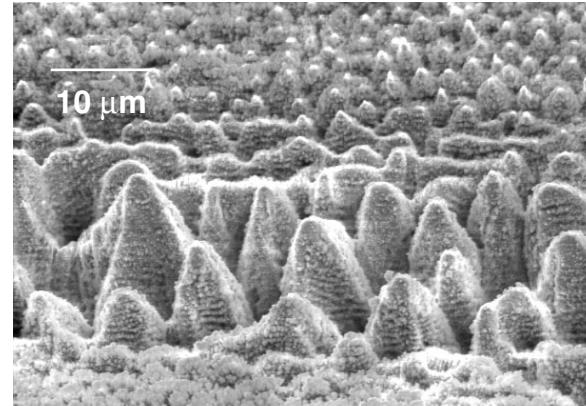
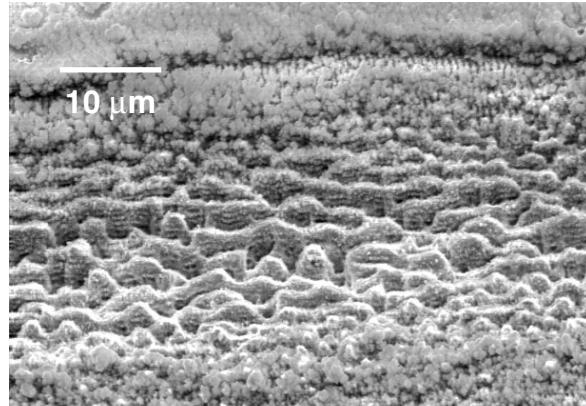


Introduction



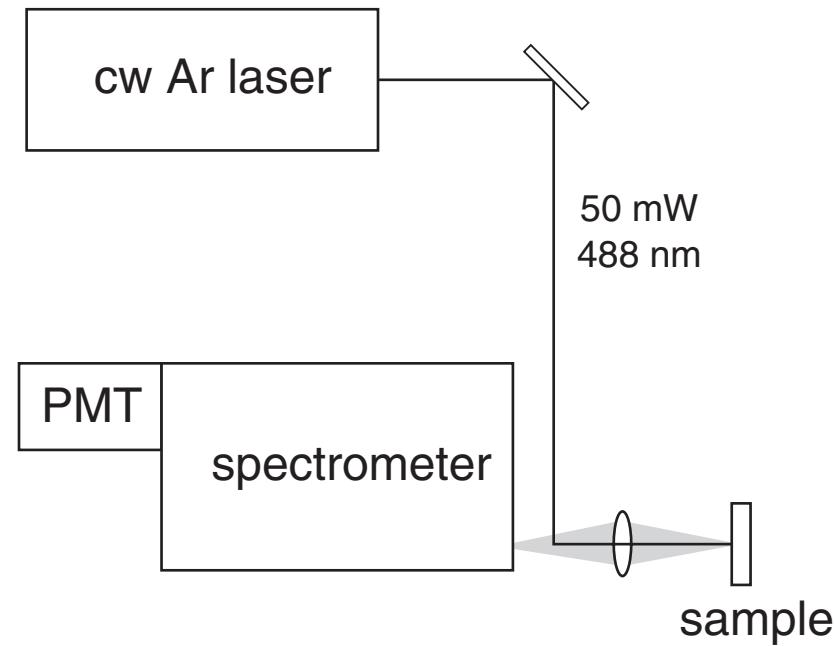
Introduction

morphology of structures fabricated in air



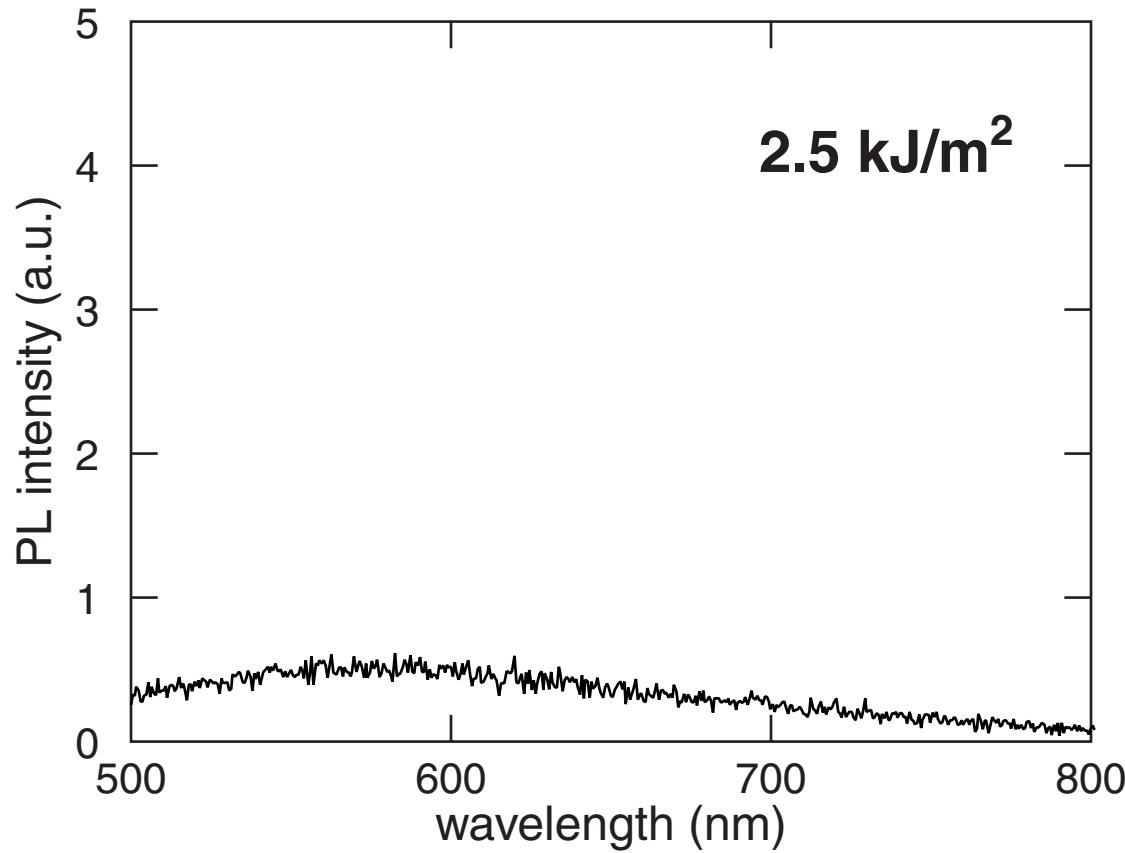
Results

photoluminescence setup



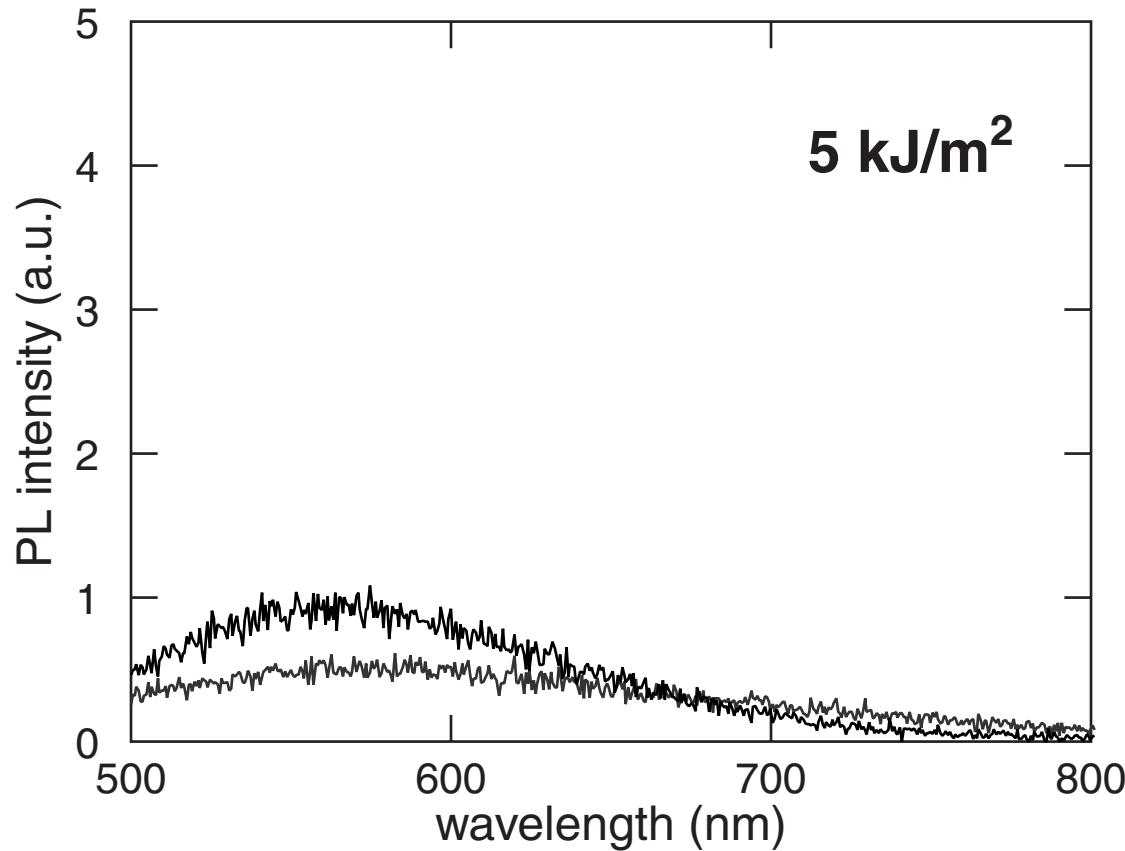
Results

photoluminescence spectrum



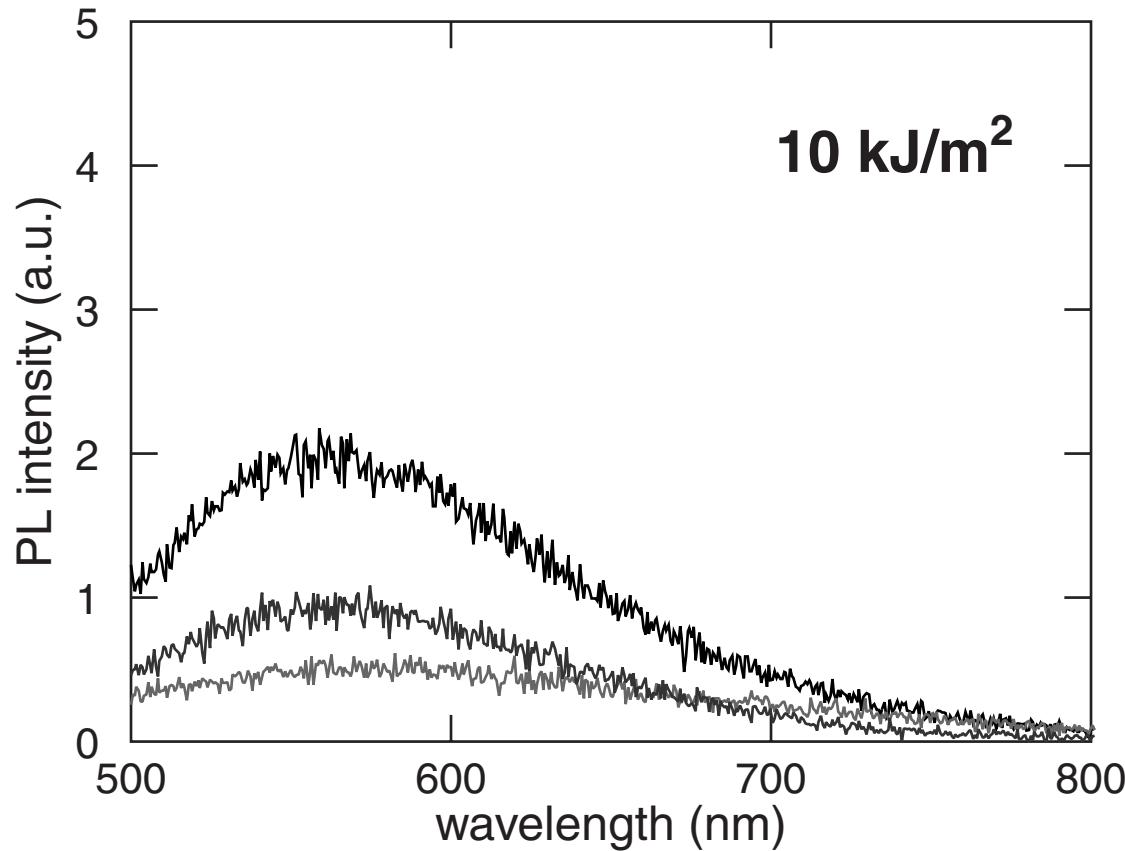
Results

photoluminescence spectrum



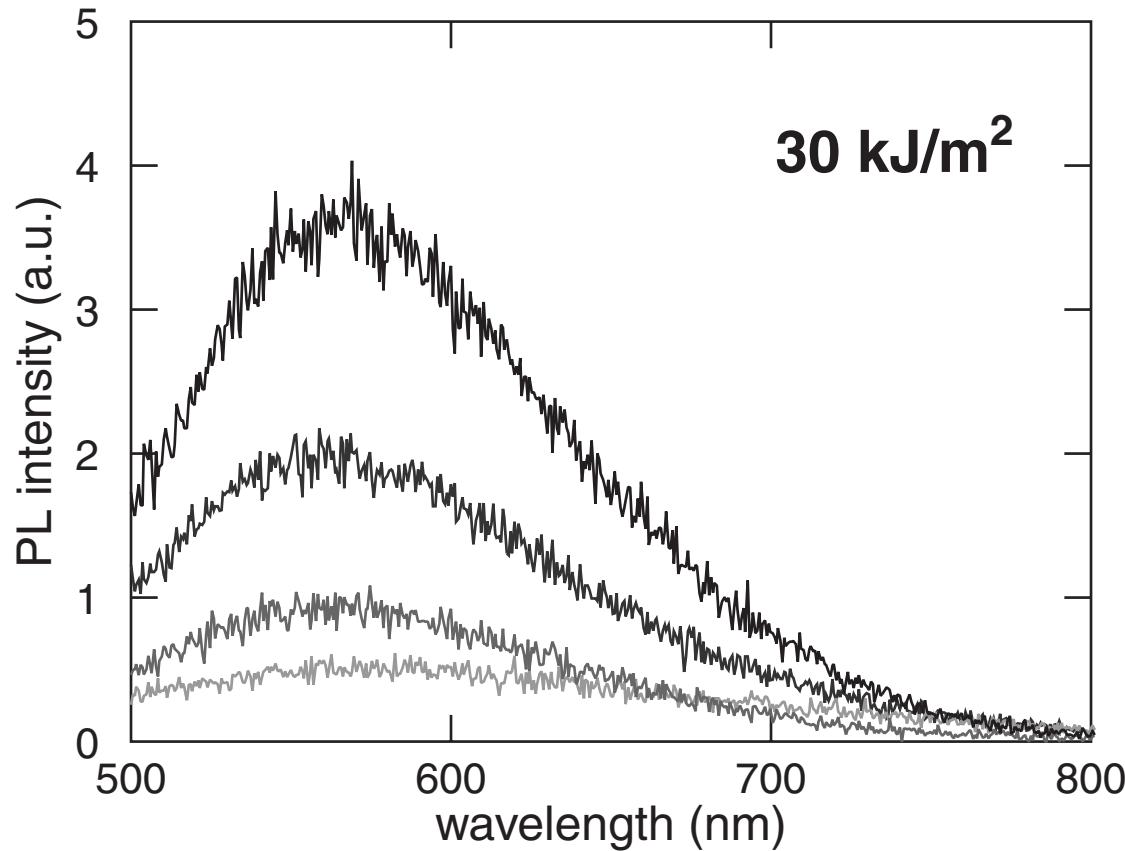
Results

photoluminescence spectrum



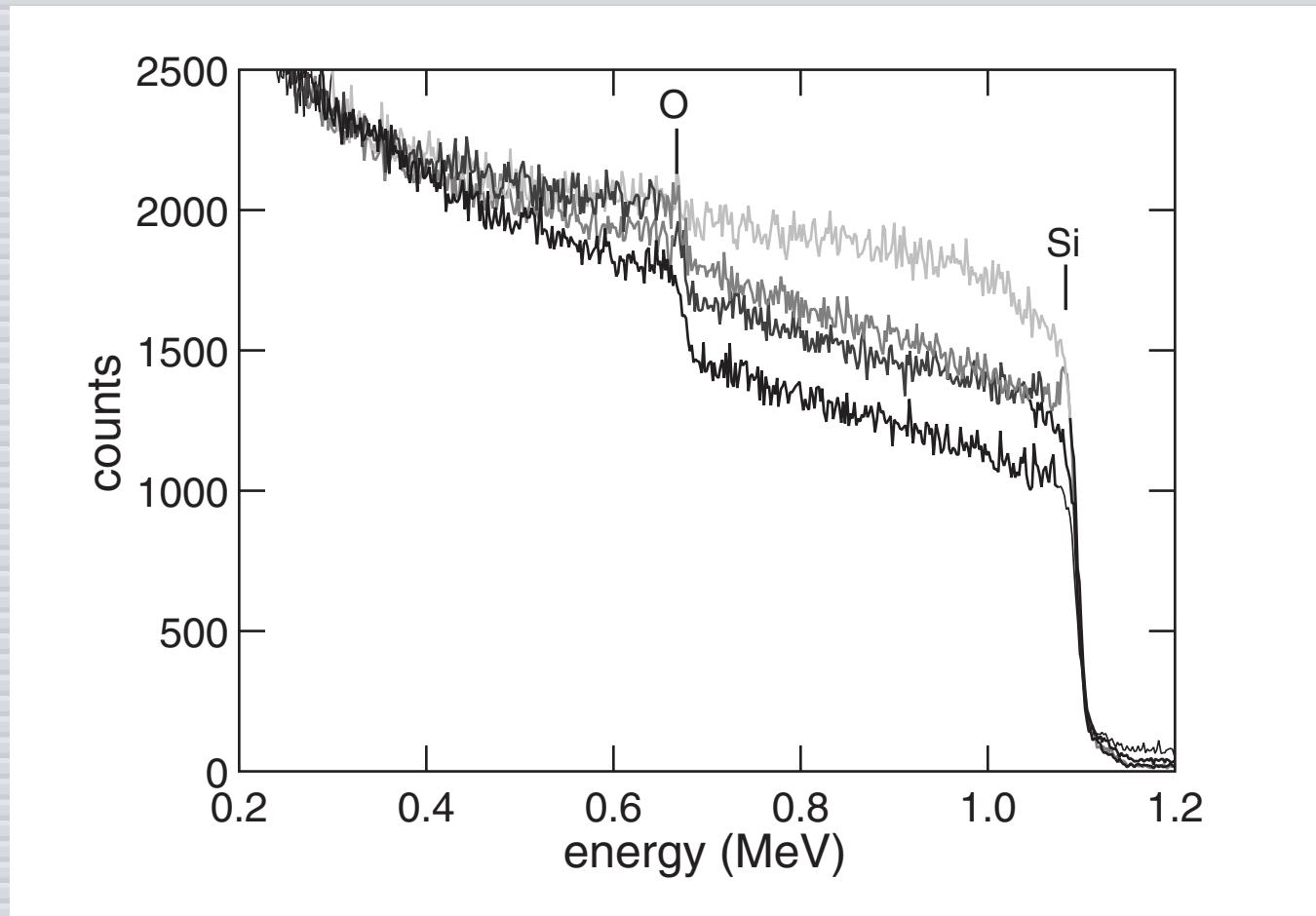
Results

photoluminescence spectrum



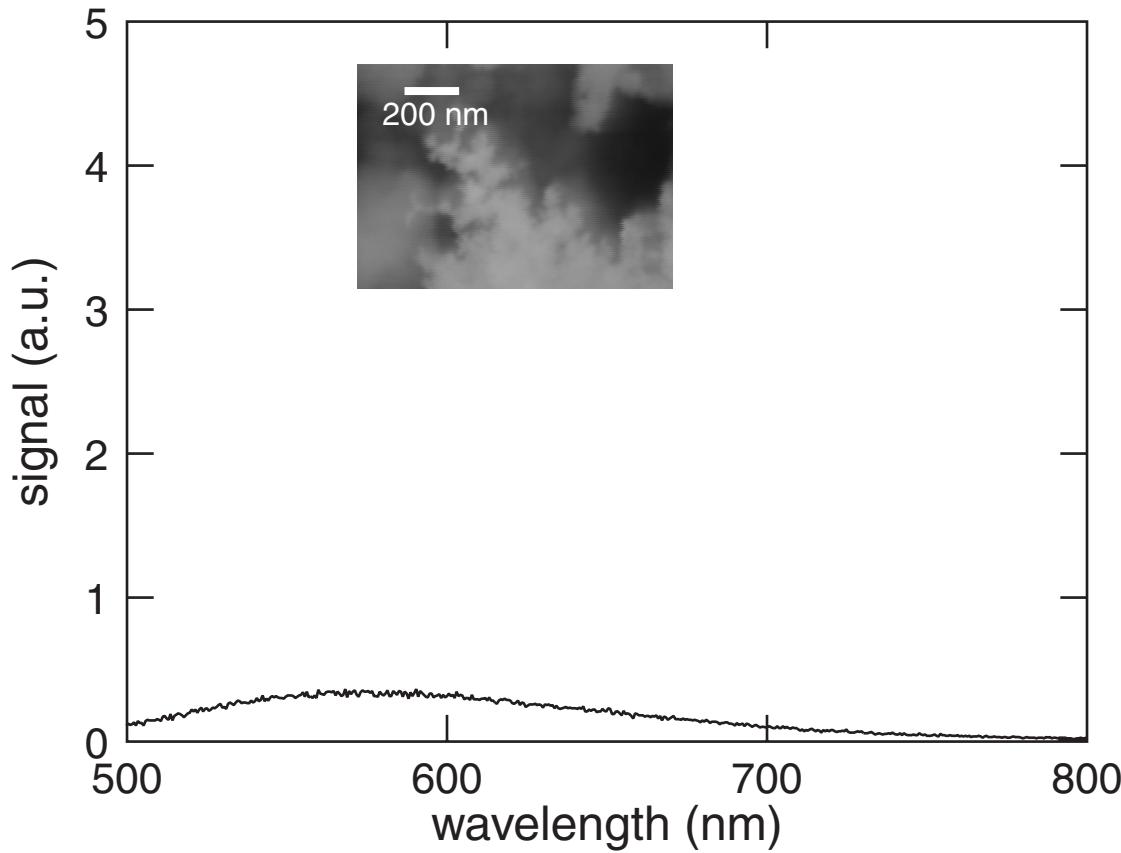
Results

Rutherford backscattering



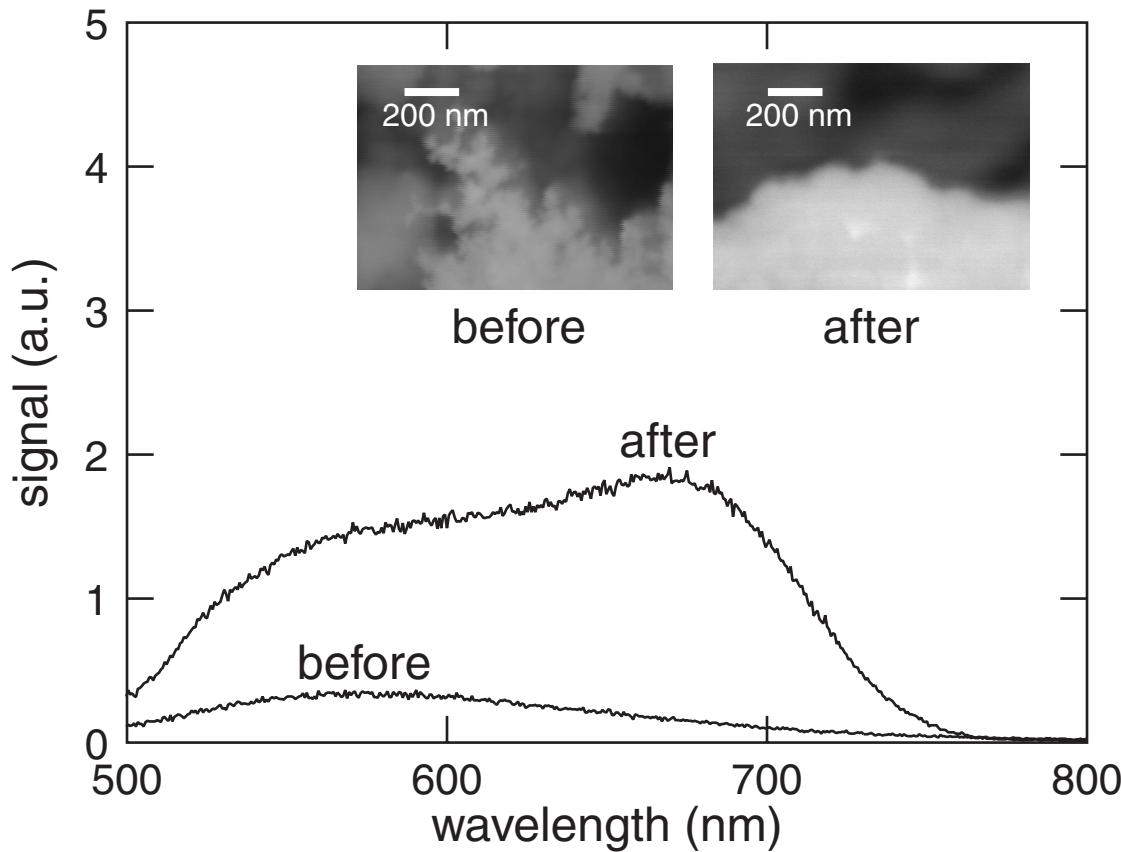
Results

before annealing



Results

after annealing at 1300 K in vacuum



Summary

Observations:

- ▶ **green peak grows with oxygen content**
- ▶ **annealing increases green peak without shift**
- ▶ **annealing causes red peak to appear**
- ▶ **annealing removes dendritic nanostructure**

Summary

Questions:

- ▶ **red peak due to quantum confinement?**
- ▶ **chemical and structural information?**
- ▶ **spatial resolution of luminescence?**
- ▶ **where do we go from here?**

GORDON MCKAY
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**For a copy of this talk and
additional information, see:**

<http://mazur-www.harvard.edu>