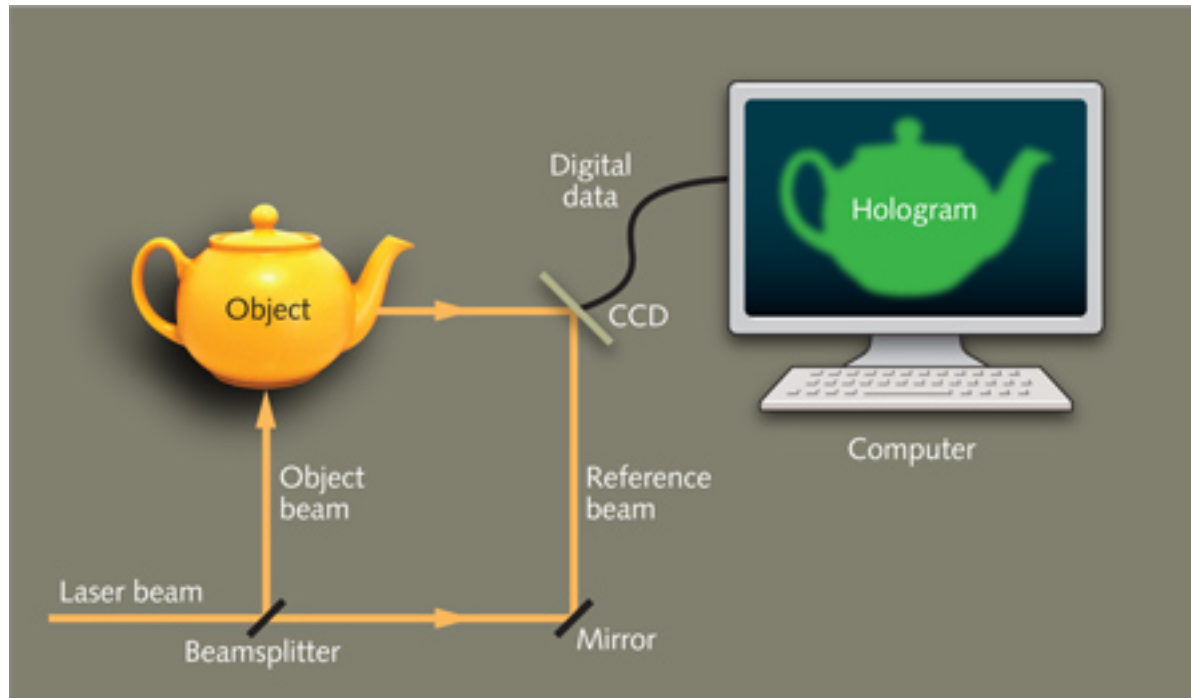




Digital Holography



- *Use CCD to record a hologram & computer to reconstruct the object*
- *More at the next lecture*



Sugar Solution/Polarization Rotation

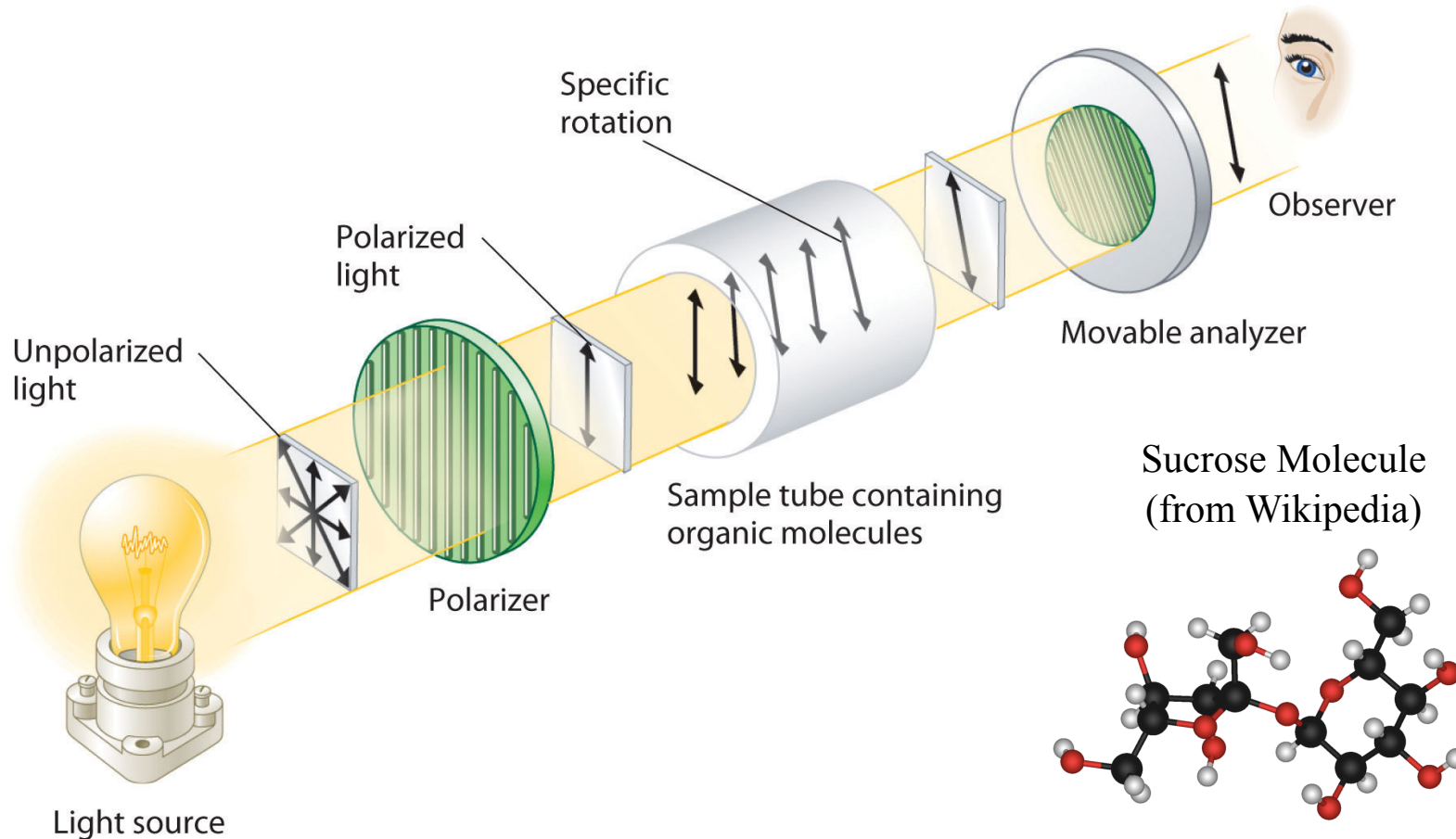
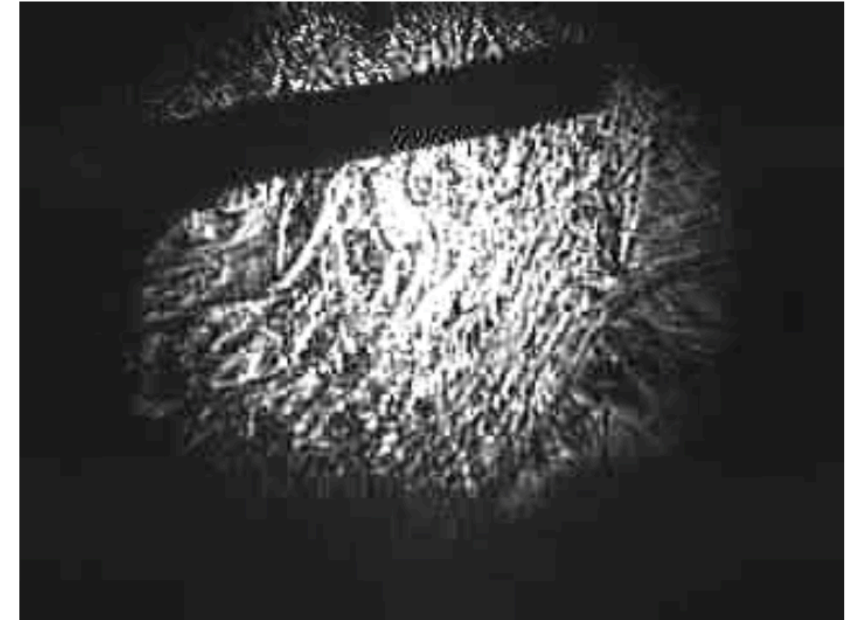


Image taken from http://2012books.lardbucket.org/books/principles-of-general-chemistry-v1.0/section_28/a337ad5ab915a2785a17ae18073a40a9.jpg



Shadowgraphy vs. Schlieren



(a) Shadowgraph Image of stirred sugar water in a glass container

(b) Schlieren Image of stirred sugar water in a glass container

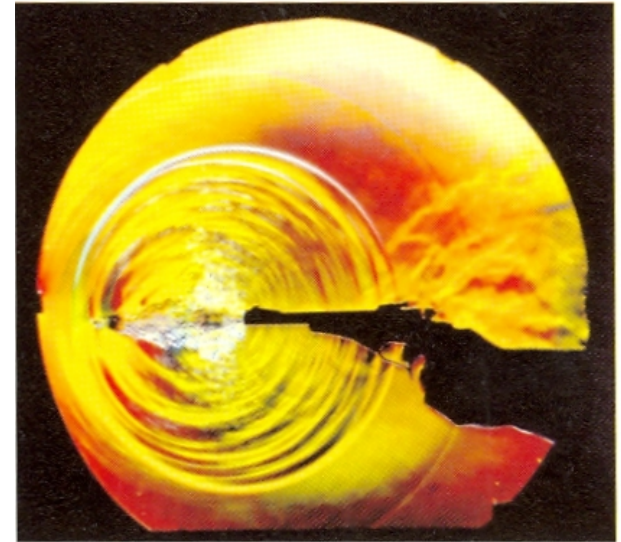
- ***Compare directly two phase-sensitive imaging techniques***



Build your own Schlieren camera!



Removing frozen
pizza from case
(Settles 2001)



A gun firing 0.22
caliber bullet
(Settles 2001)

Heat from grill
(Settles 2001)



***May or may not be
feasible using the lab &
easy to get components***



Phase Retrieval (aka Lensless Imaging)

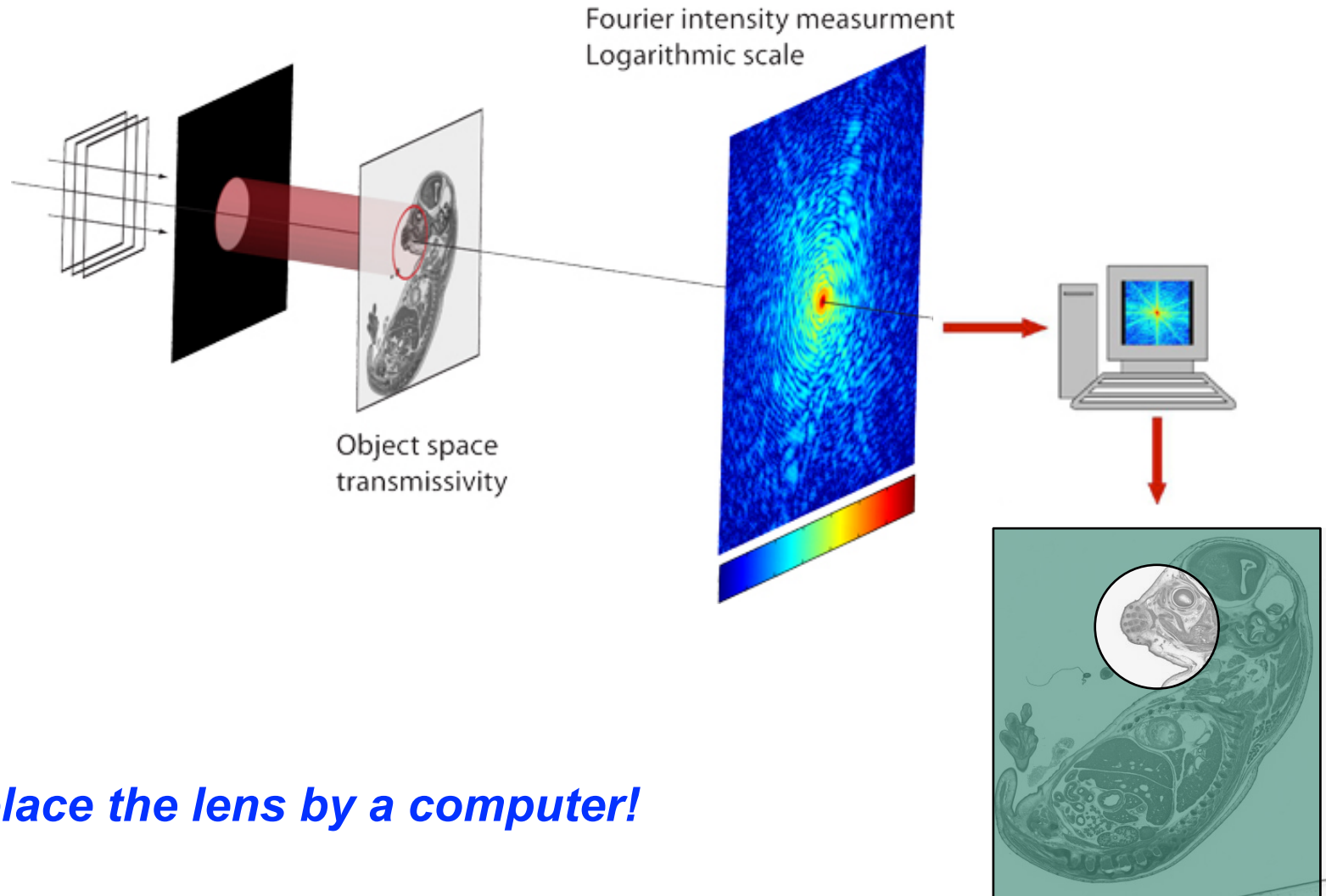
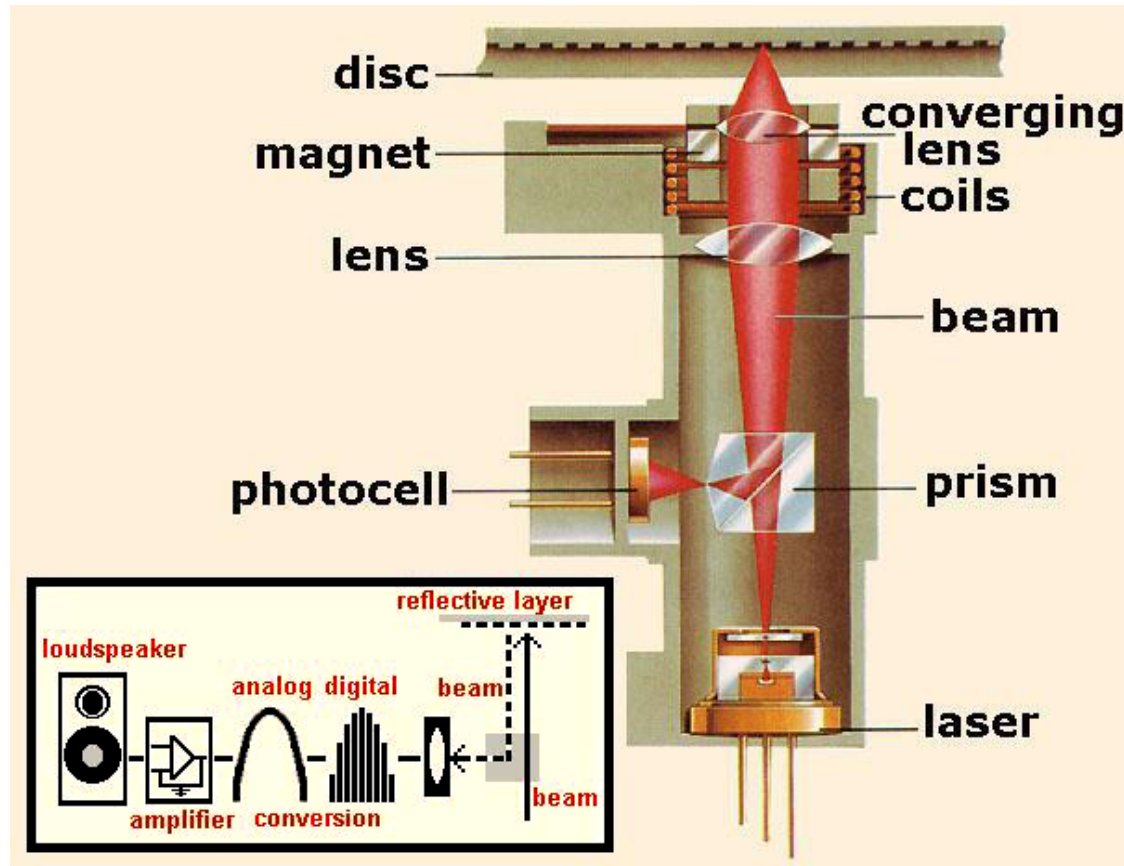


Image taken from http://www.optics.rochester.edu/workgroups/fienup/Manuel/manuel_research2.html



Read out a CD

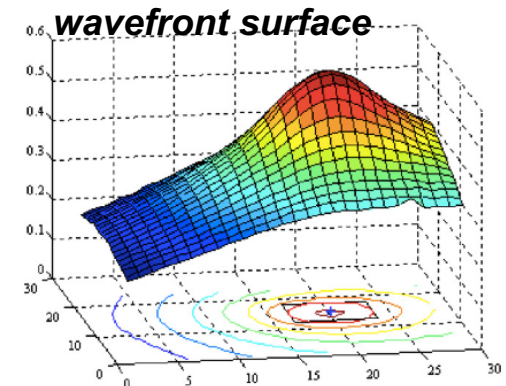
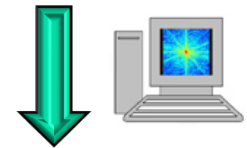
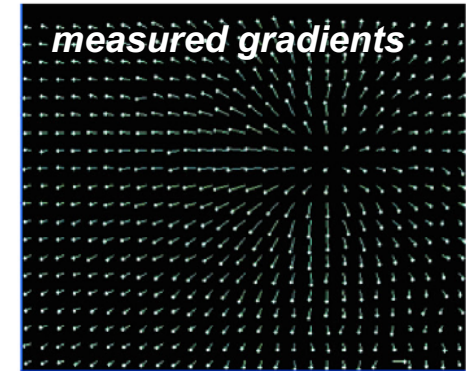
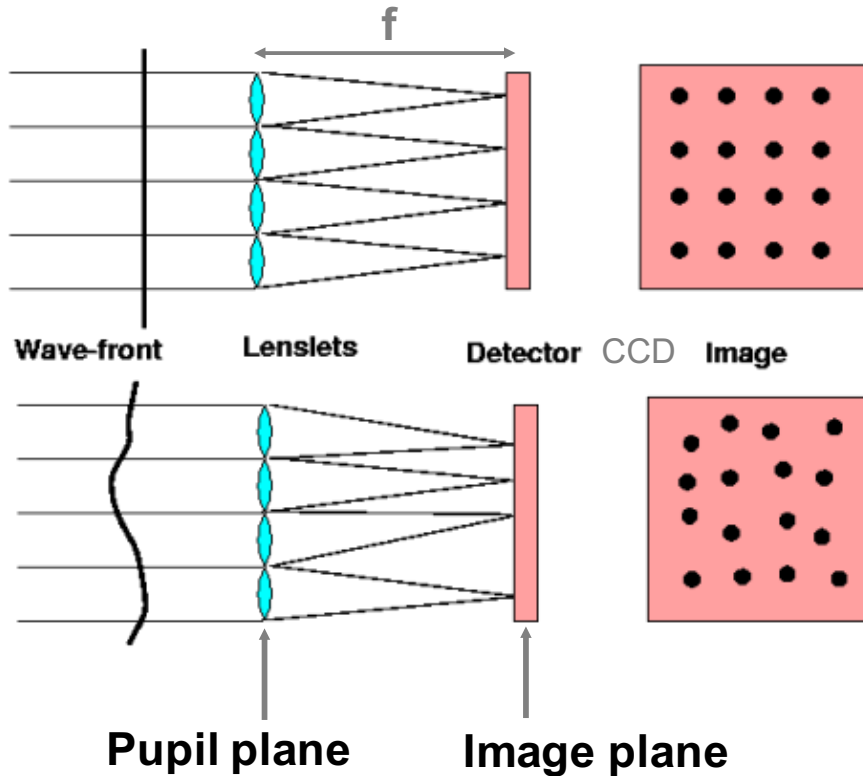


- *Reverse-engineer a CD player & read-out the bit sequence*

Image taken from <http://www.soundfountain.com/ambim/25cdlaserarm2.jpg>



Cheap Hartmann-Shack (Wavefront Sensor)



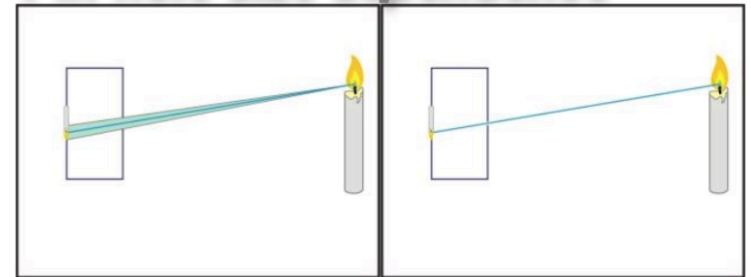
- I have a plastic array of lenslets – needs to be checked (may or may not work!)*



Pin-Hole Camera Investigation



Pin-hole size dependence



- **Study image dependence on the pin-size & compare with simulations**



Images taken from http://wernernekes.de/00_cms/cms/upload/Fotos_Sammlung/Fotos_Glossar/CO.jpg
<http://www.frostburg.edu/fsu/assets/File/clife/mscenter/Pinhole%20Group%20Paper.pdf>