

# Tickling Superconductors with Infrared

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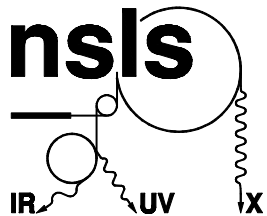
*Science using low energy photons from high energy accelerators*

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Brookhaven Science Associates  
U.S. Department of Energy

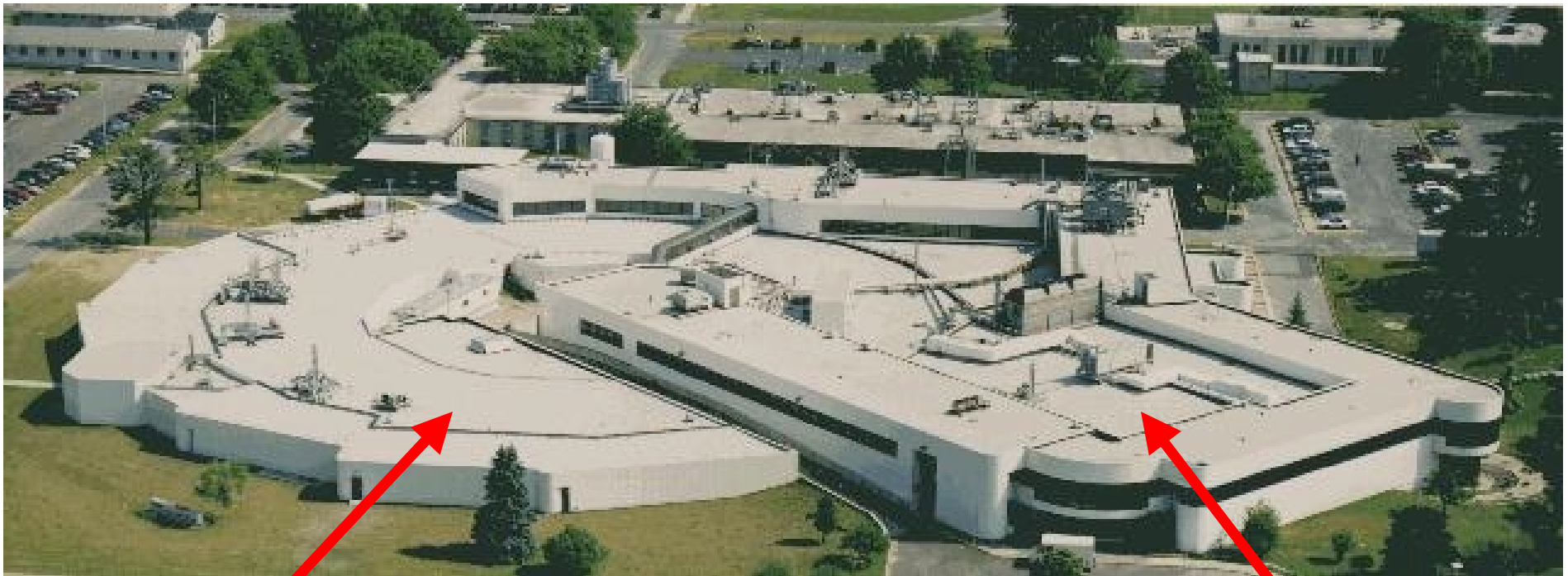


# National Synchrotron Light Source

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2.8 GeV (x-ray) and 800 MeV (VUV) electron storage rings.

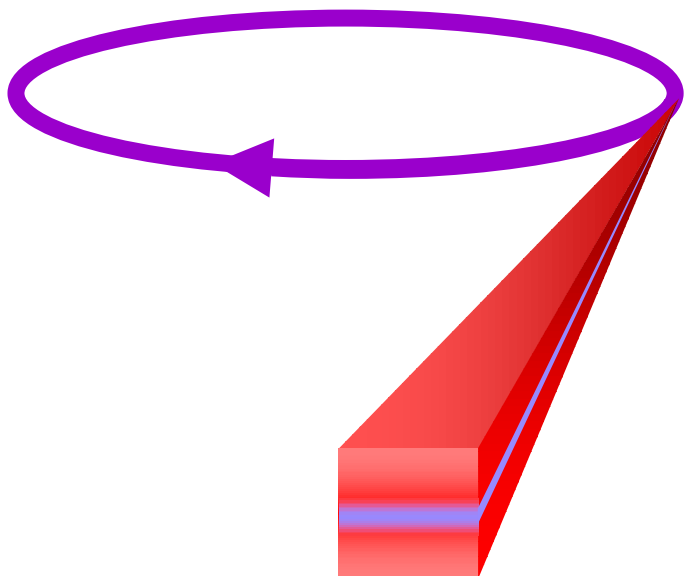
6 beamlines on VUV ring dedicated to infrared measurements.



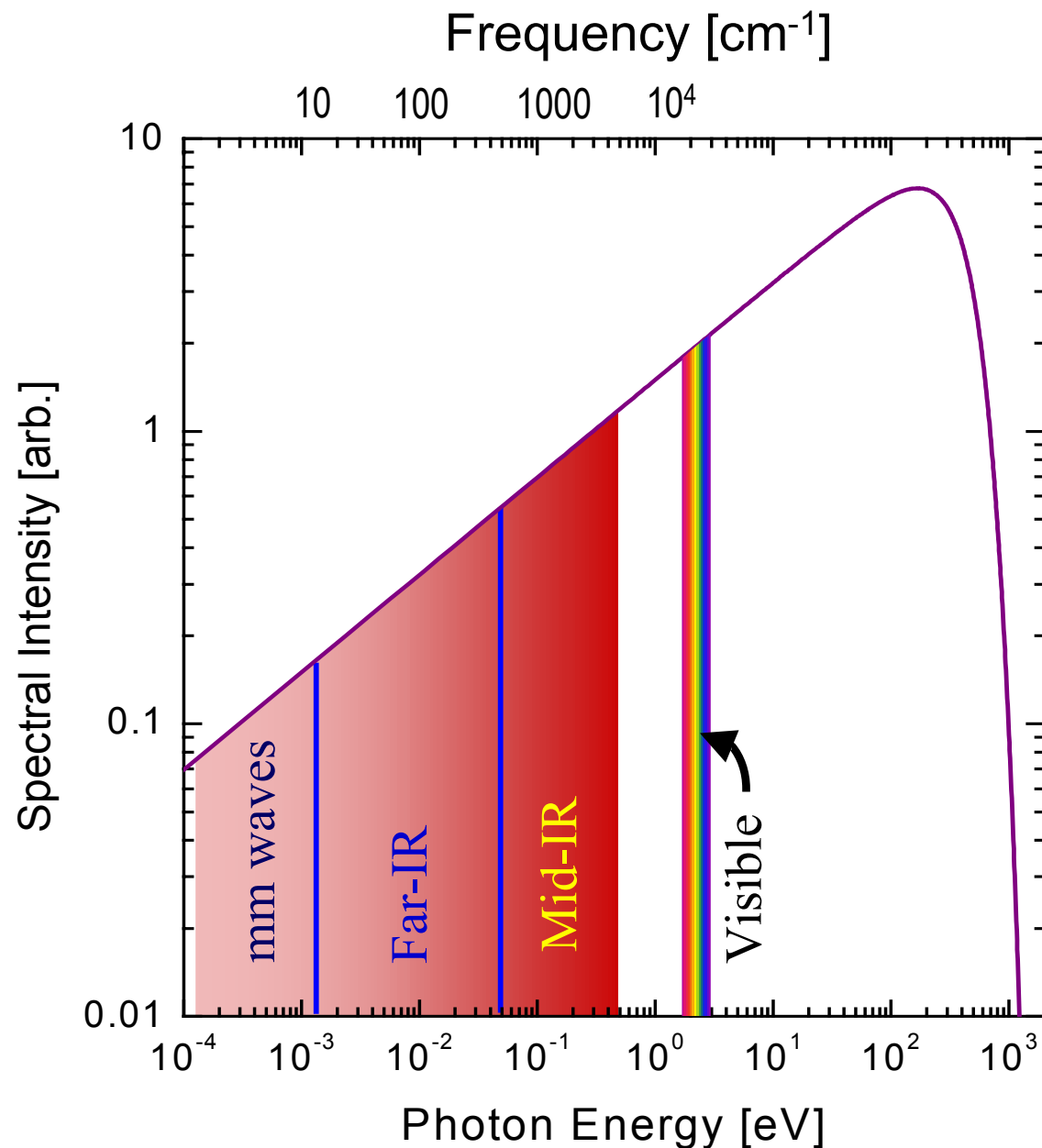
X-ray ring

VUV ring

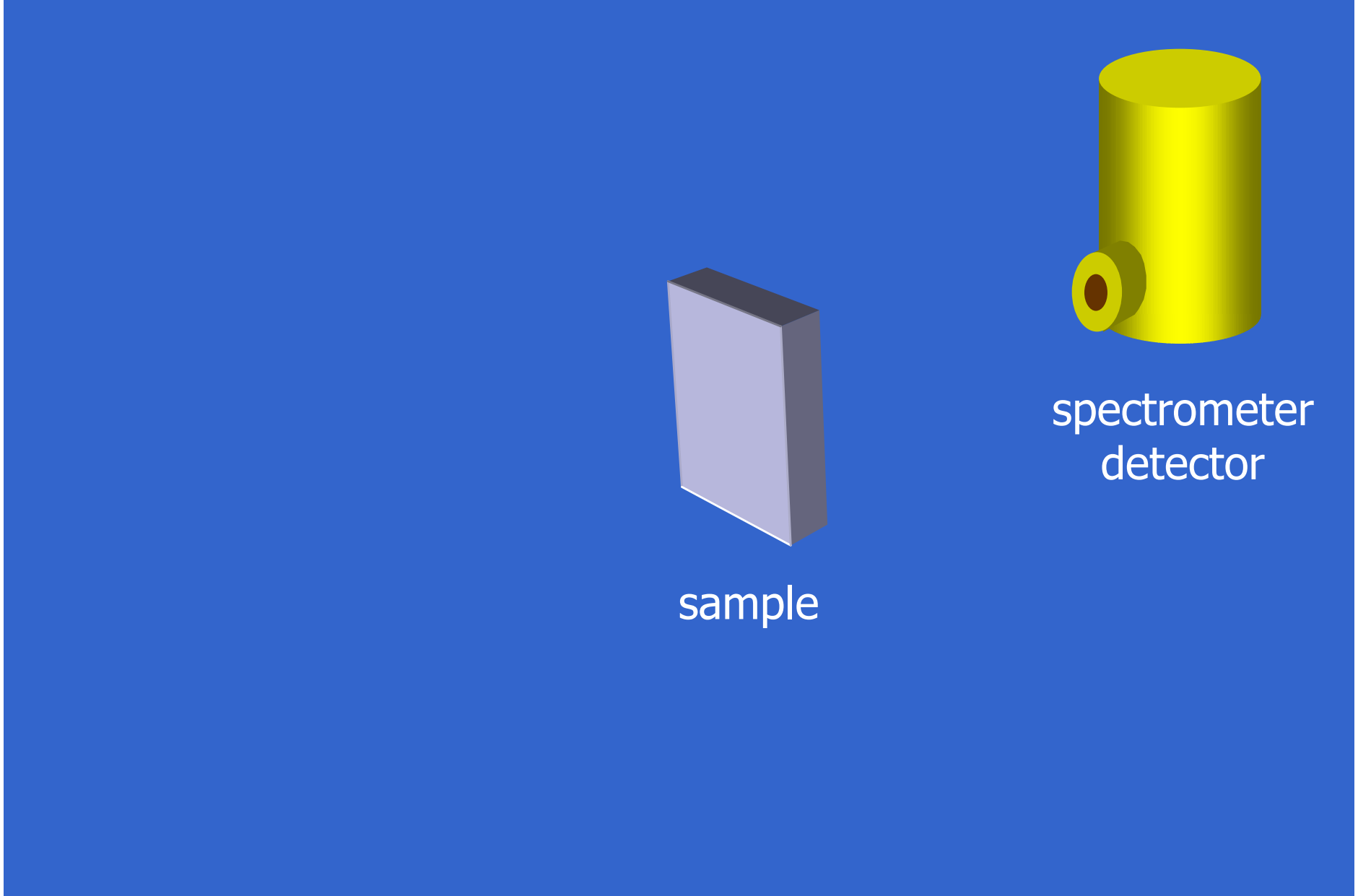
# Infrared Synchrotron Radiation



- "White" source
- High Brightness
- Long wavelength flux (the far-infrared)
- Pulsed (100s of ps)

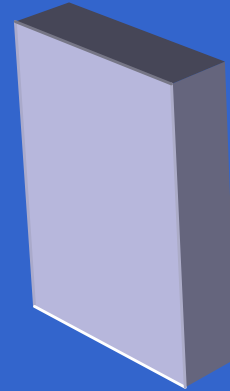
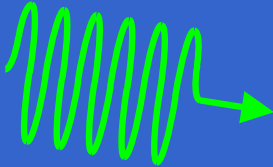


# Pump-probe Spectroscopy

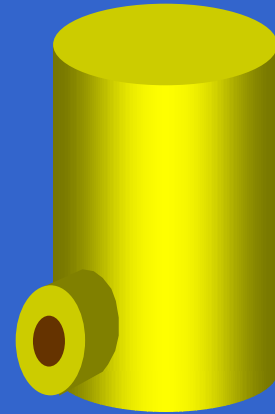


# Pump-probe Spectroscopy

pump pulse  
from laser

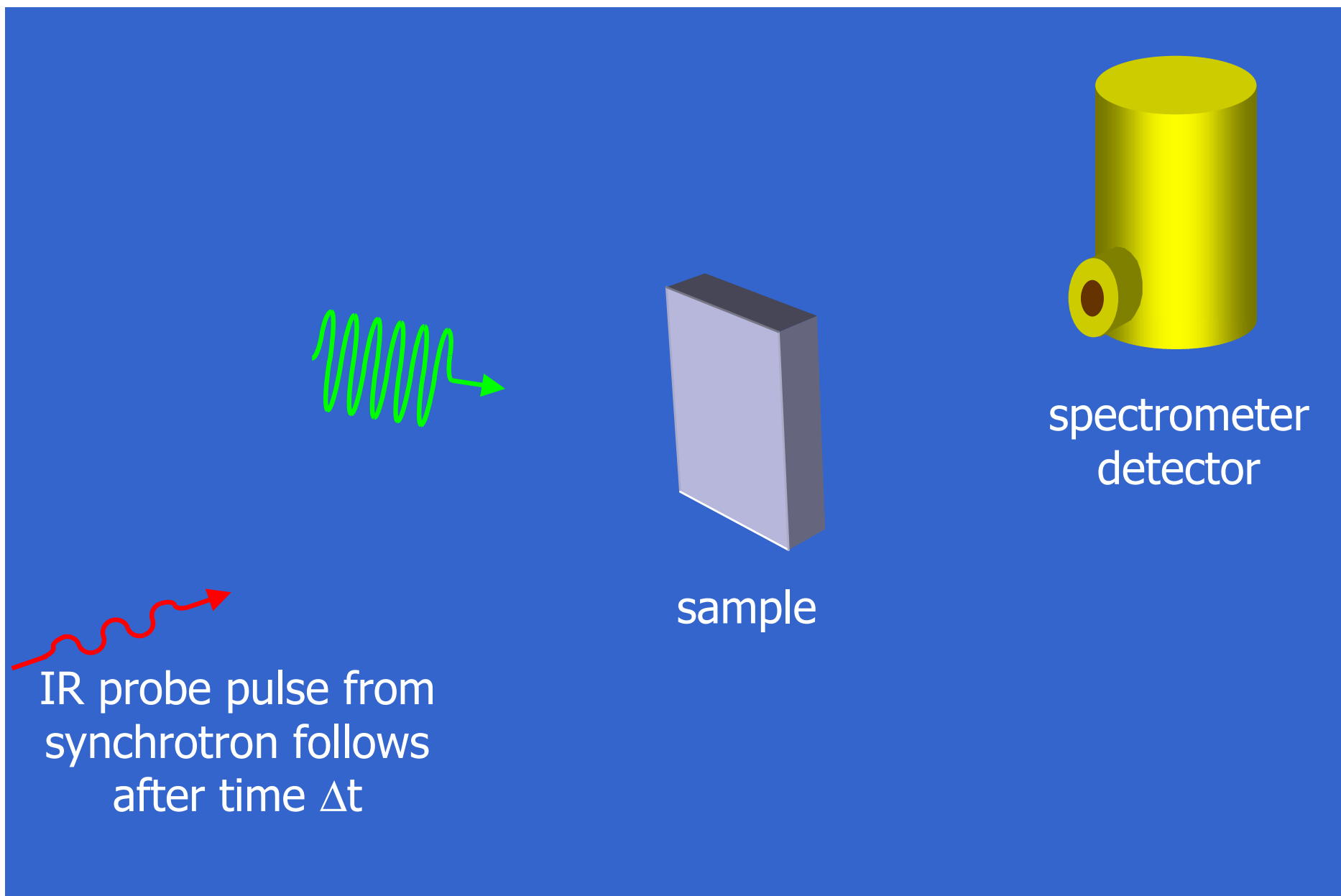


sample

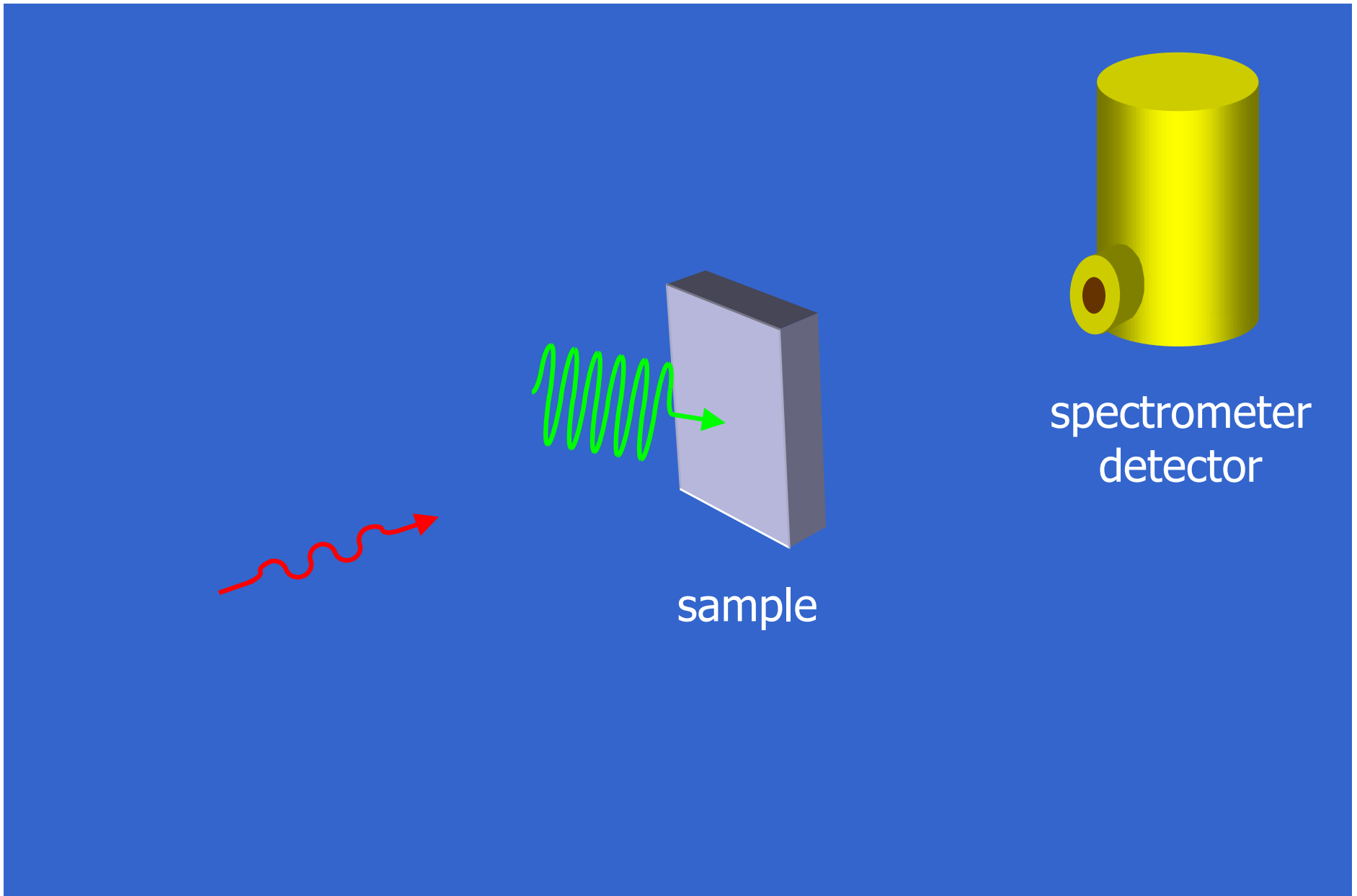


spectrometer  
detector

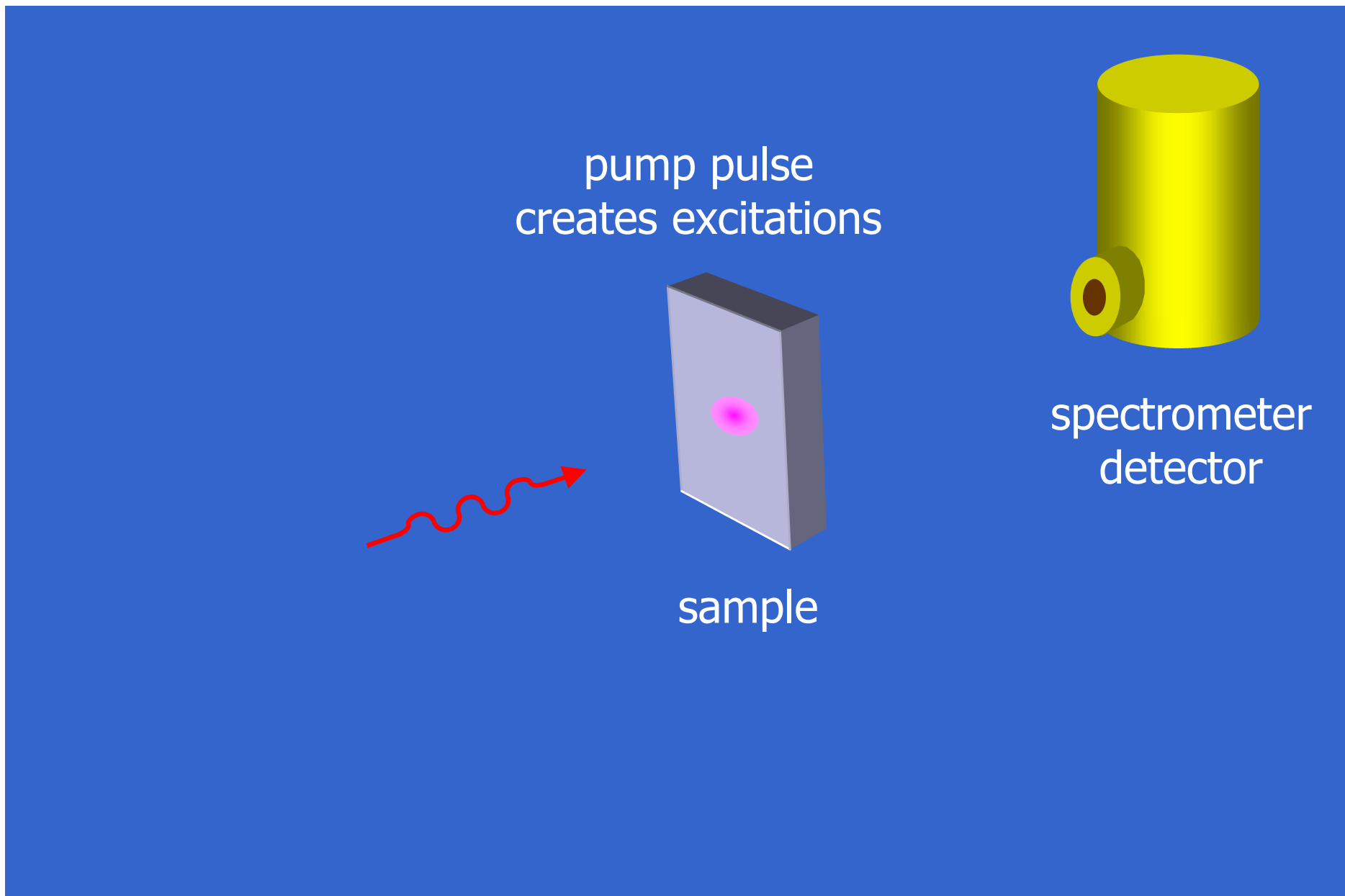
# Pump-probe Spectroscopy



# Pump-probe Spectroscopy



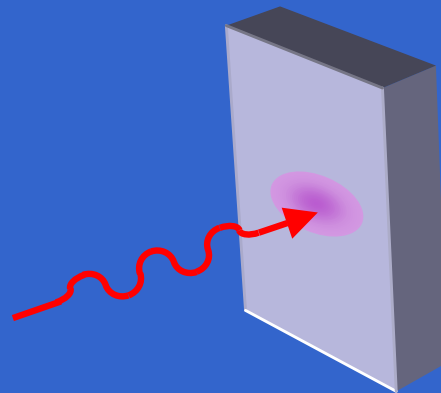
# Pump-probe Spectroscopy



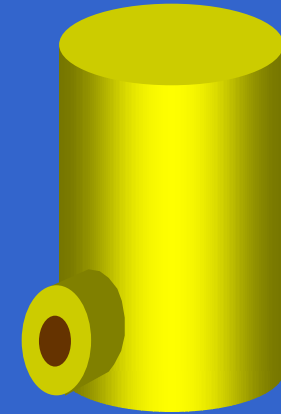


# Pump-probe Spectroscopy

probe pulse senses  
excitations at time  $\Delta t$

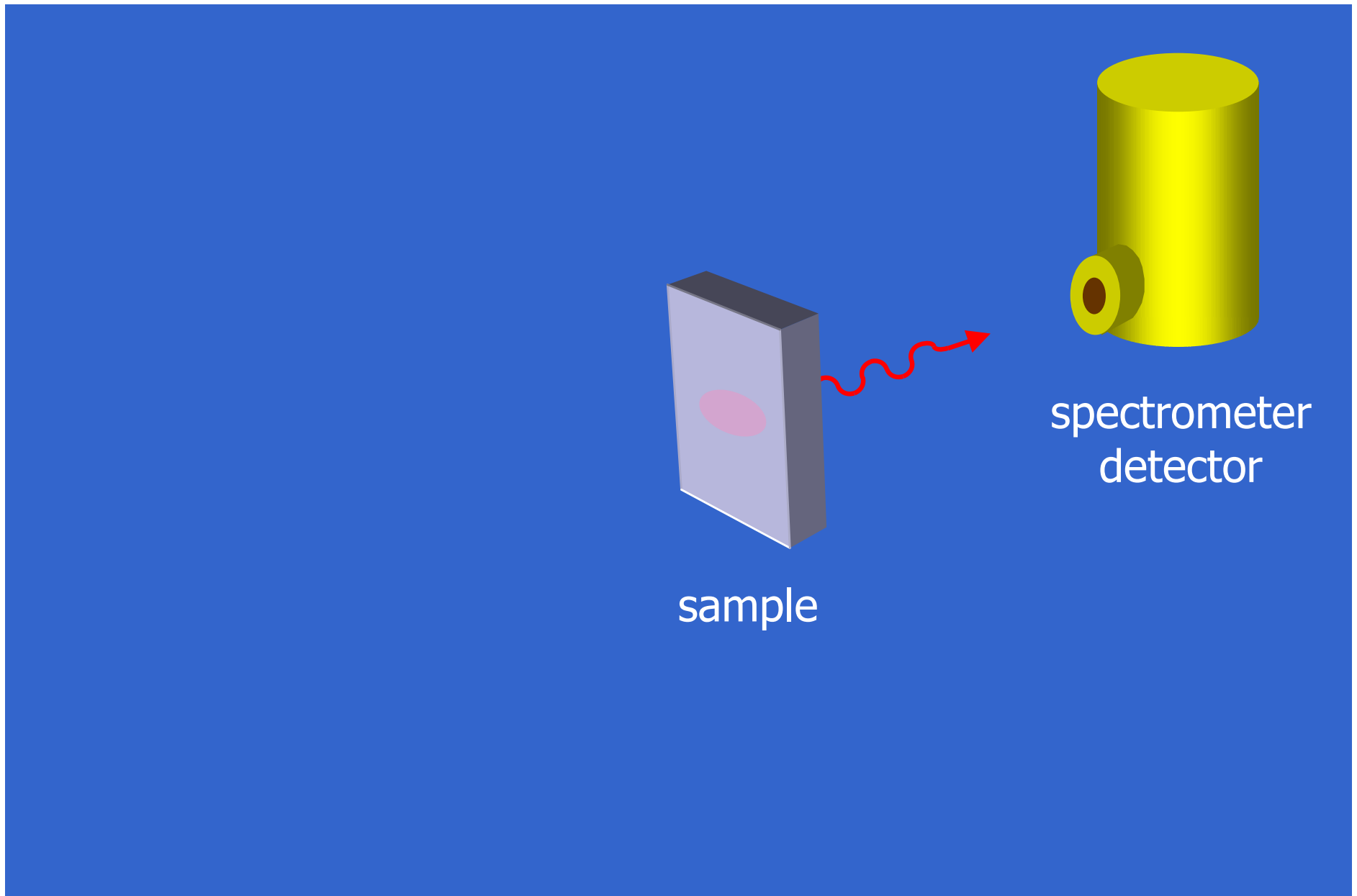


sample



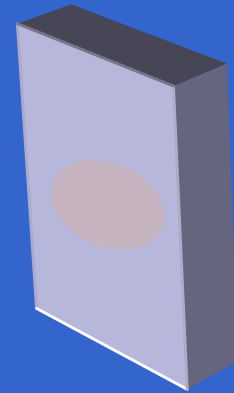
spectrometer  
detector

# Pump-probe Spectroscopy

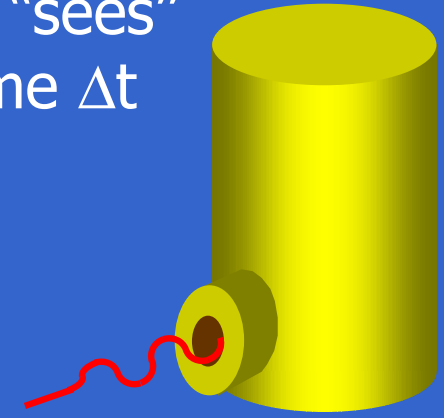


# Pump-probe Spectroscopy

detector only "sees"  
sample at time  $\Delta t$

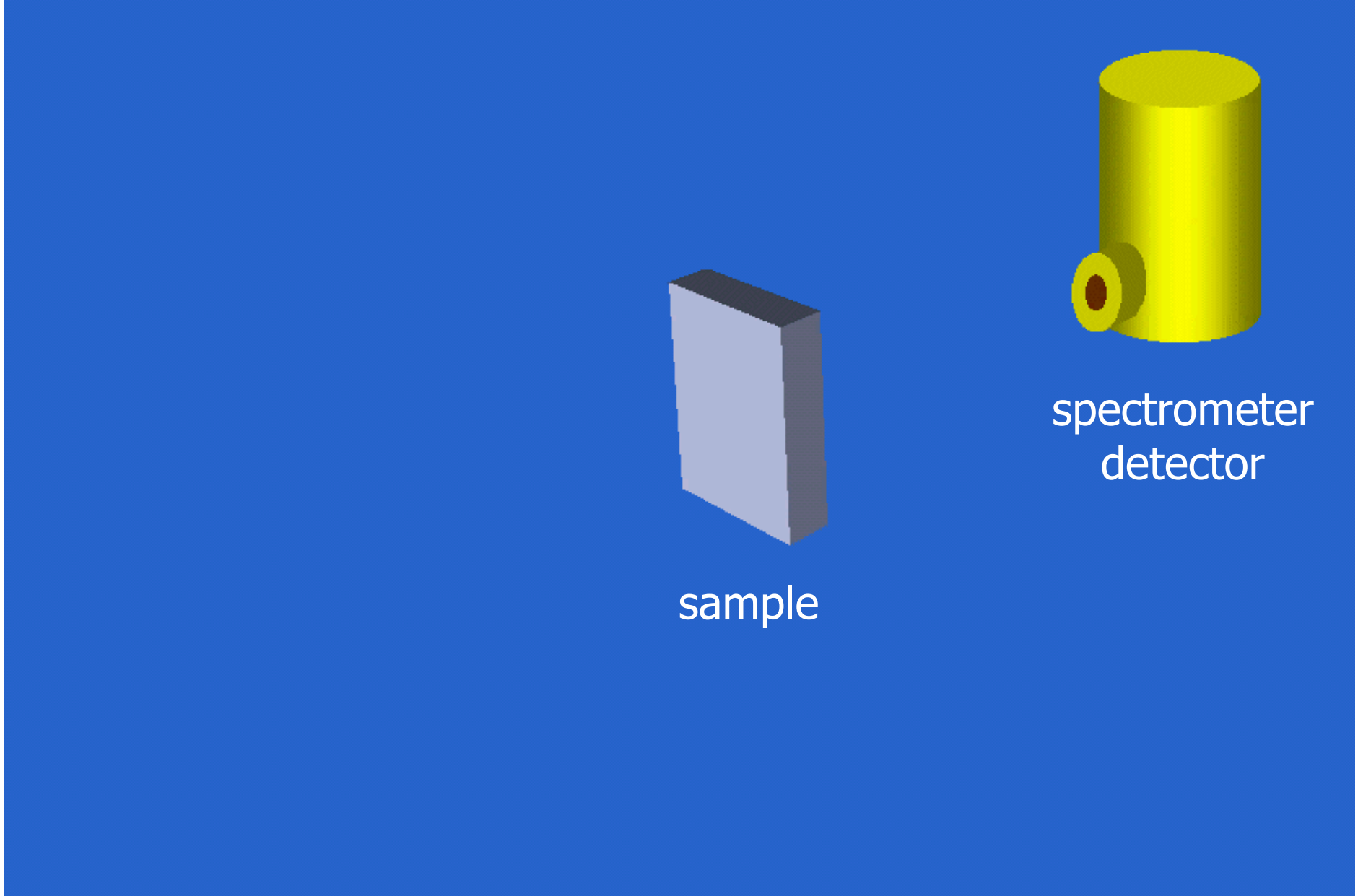


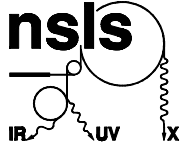
sample



spectrometer  
detector

# Pump-probe Spectroscopy





# Acknowledgements

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