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# Web Cam Spectroscopy of LASER Induced Fluorescence of Play-Doh

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# Web Cam Spectroscopy of LASER Induced Fluorescence of Play-Doh

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## Horseplay Pays Off

Ever notice when you are pointing your violet LASER at various color Play-Doh while wearing your diffraction glasses you get an eye full of colors. These colors are inconsistent with the color of your LASER (you know that monochromatic light source). So of course you do what anyone would do and hit it with your green and red LASER and again see the Play-Doh fluoresce. If only we had an inexpensive spectrometer!!!!

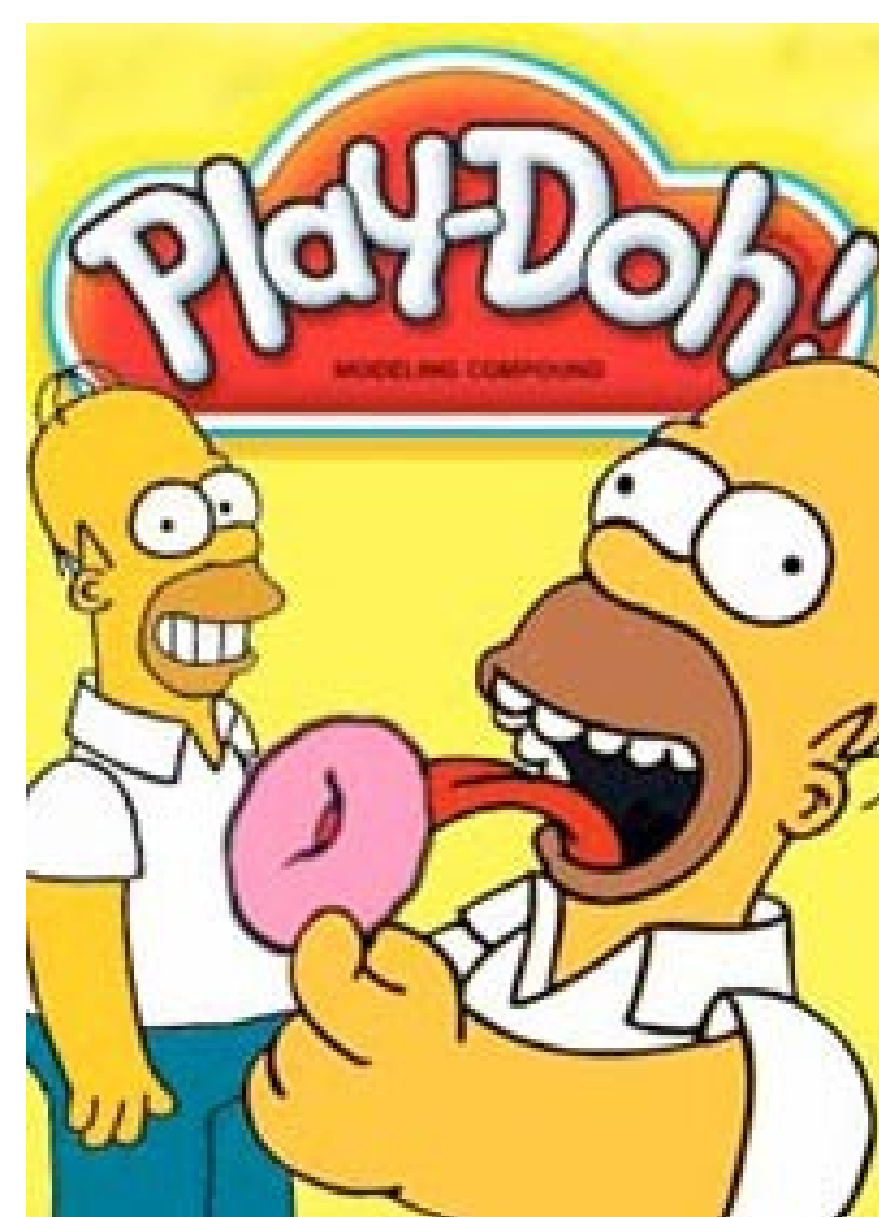


Play-Doh - \$1  
 Blank DVD - \$1  
 Web Cam - \$10  
 LASER Pen - \$7  
 \$19 Spectrometer  
**Priceless!**

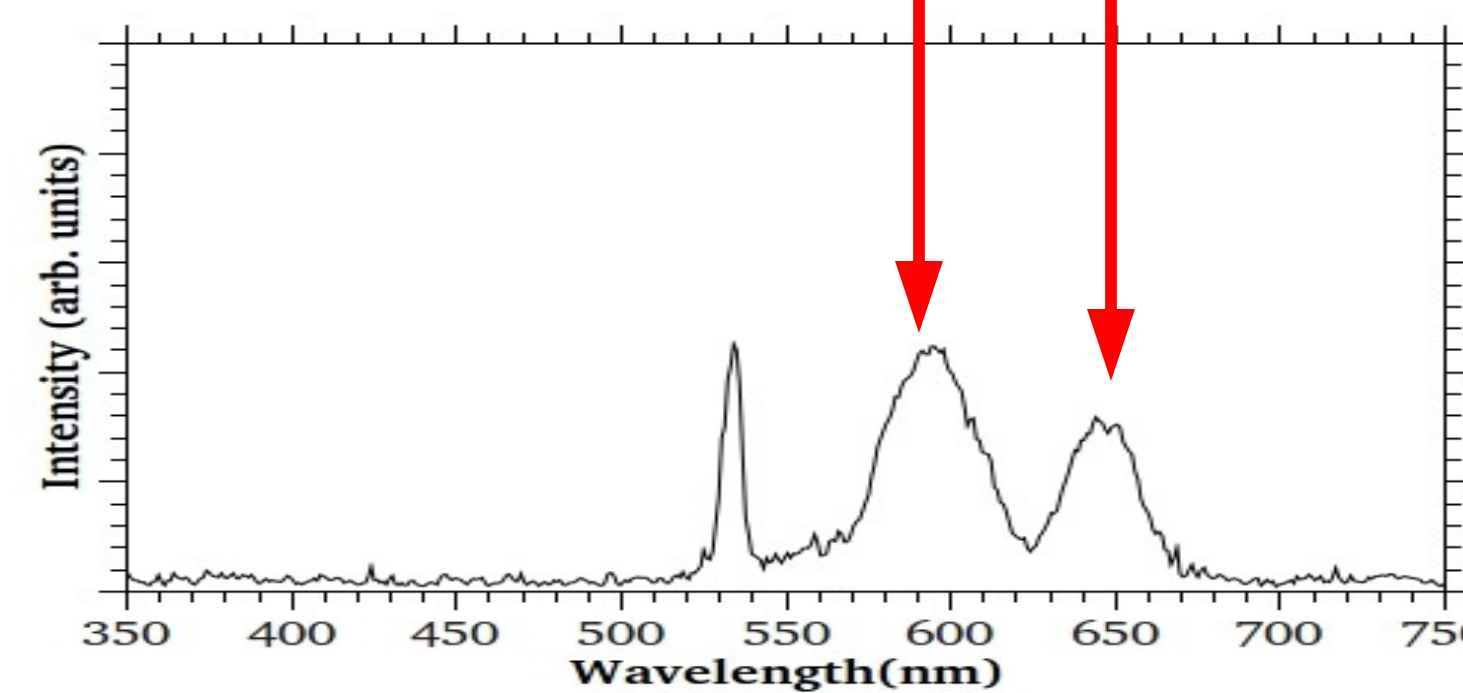
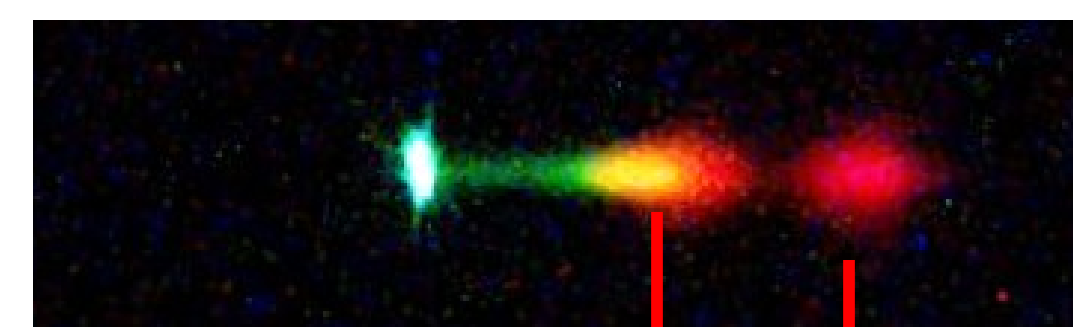
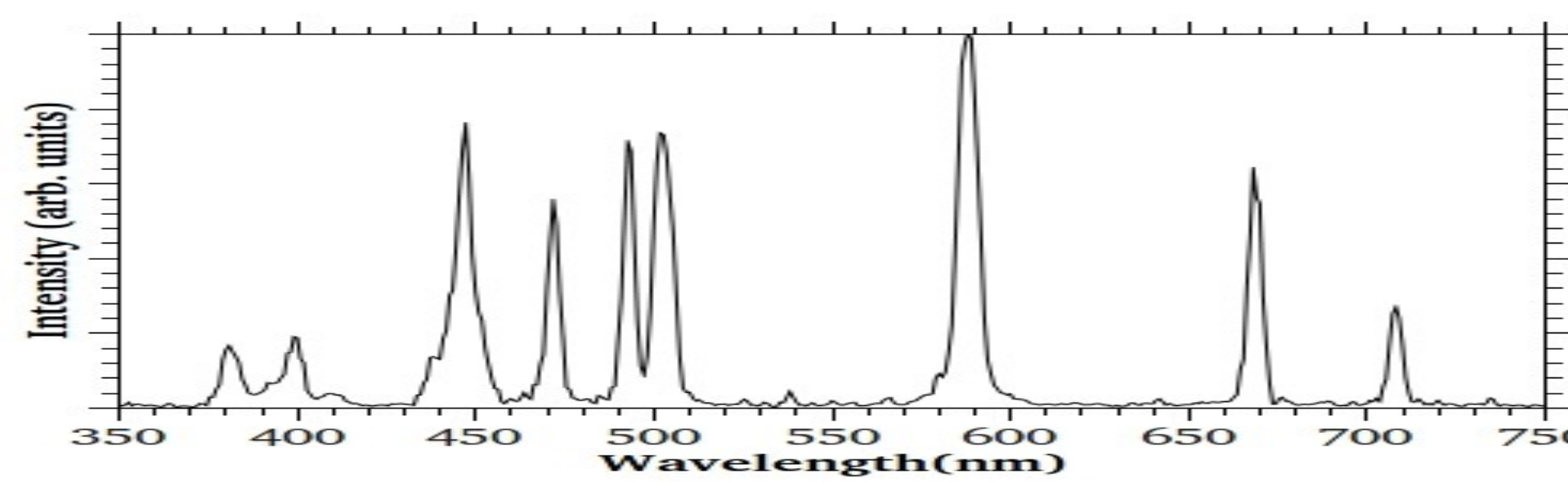
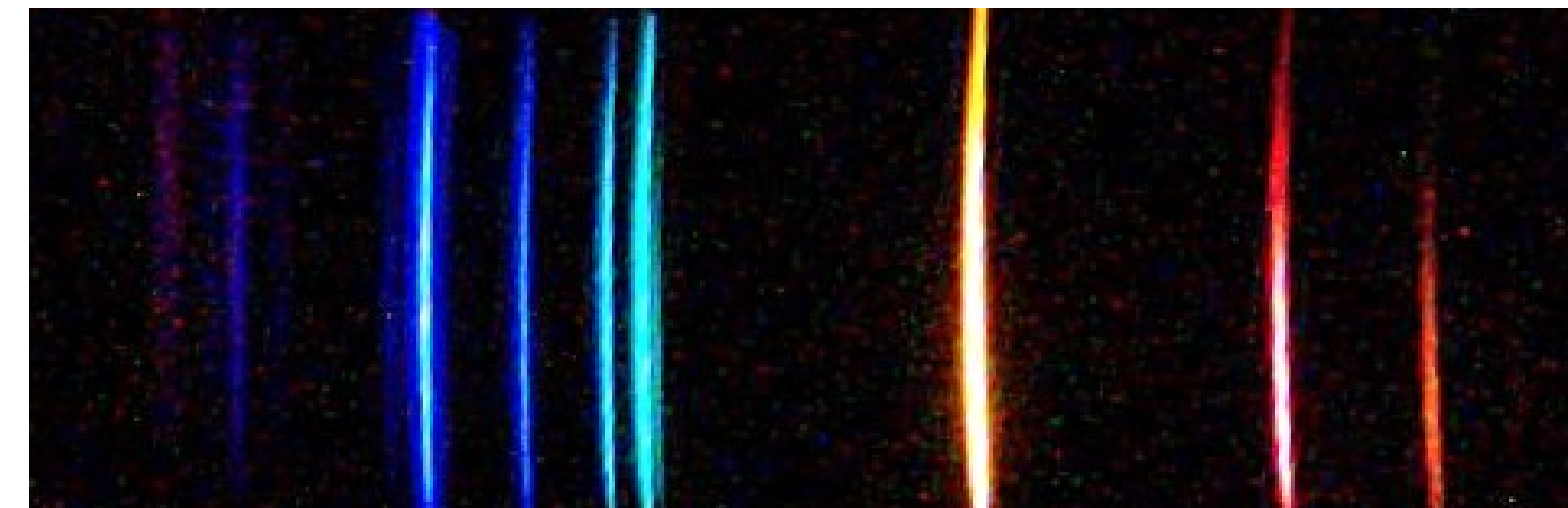


## Building the (Inexpensive) Spectrometer

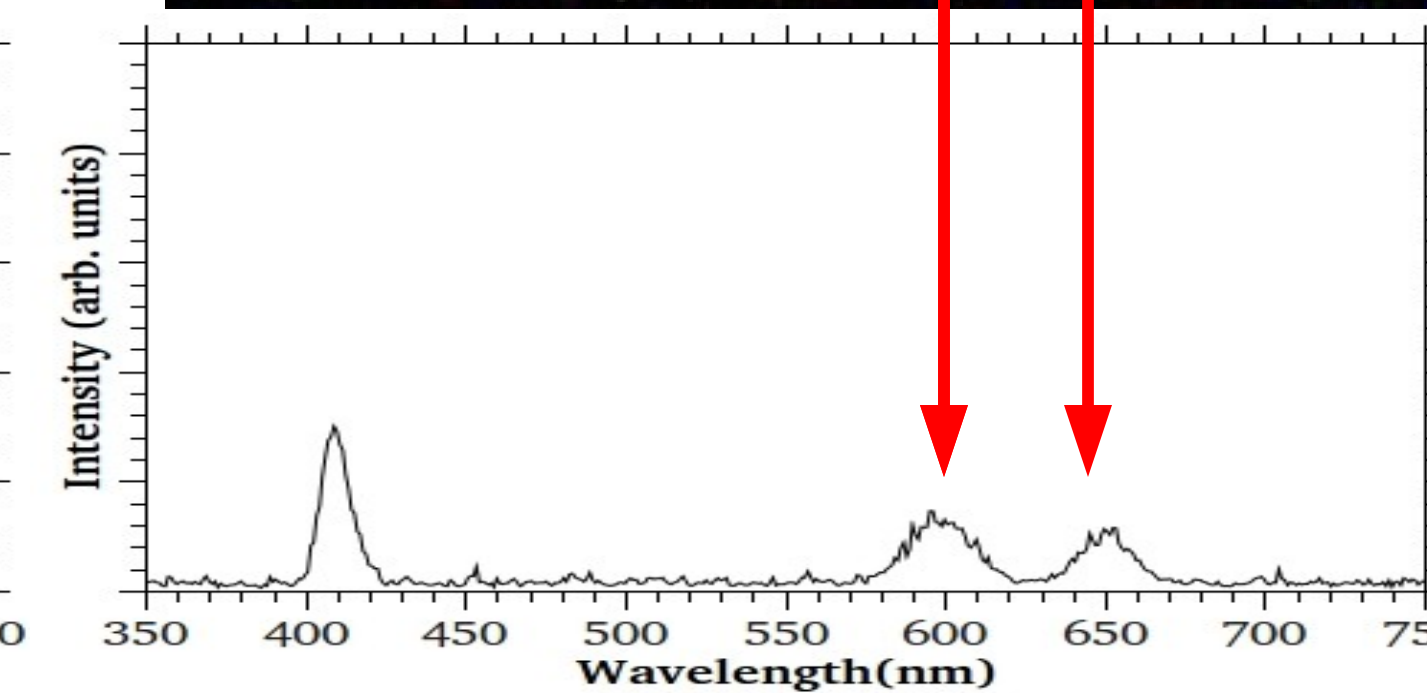
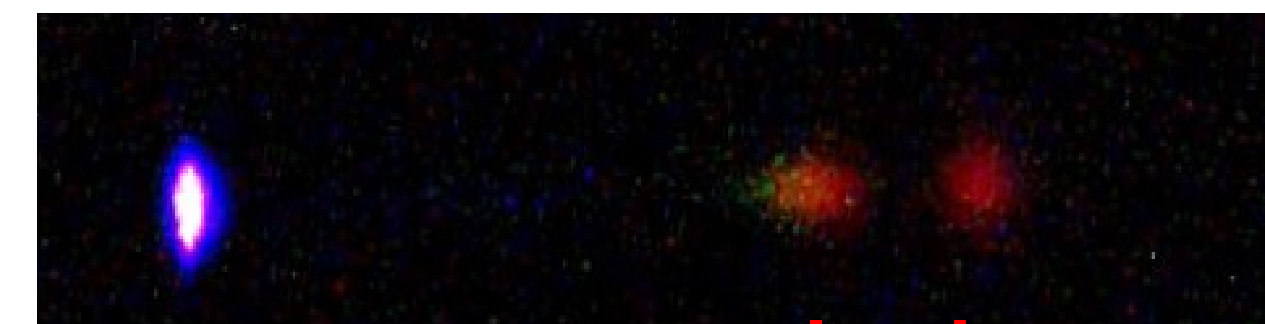
Ever look at the surface of a DVD and see a rainbow? It turns out that a DVD functions as an inexpensive diffraction grating. So by attacking an innocent DVD with a hair dryer and metal sheers we are able to surgically remove a small section to use a fully functional diffraction grating. By combining this piece of DVD with an inexpensive web cam, a razor blade slit, a cardboard box, and a LASER pointer, we are able to construct a spectrometer that is easily interfaced with a computer.



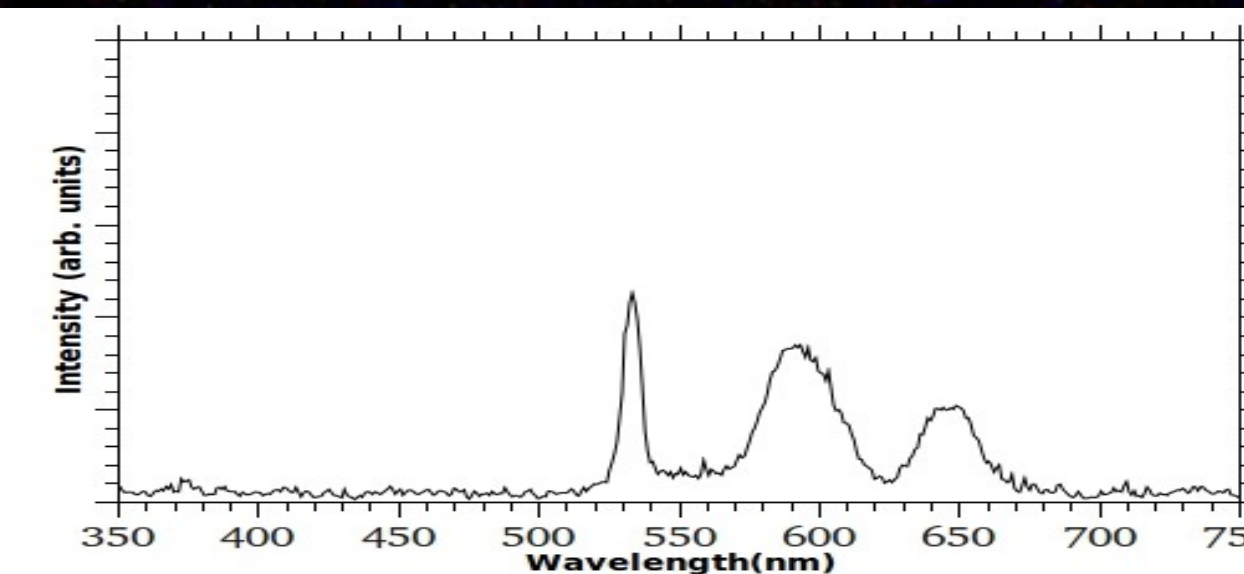
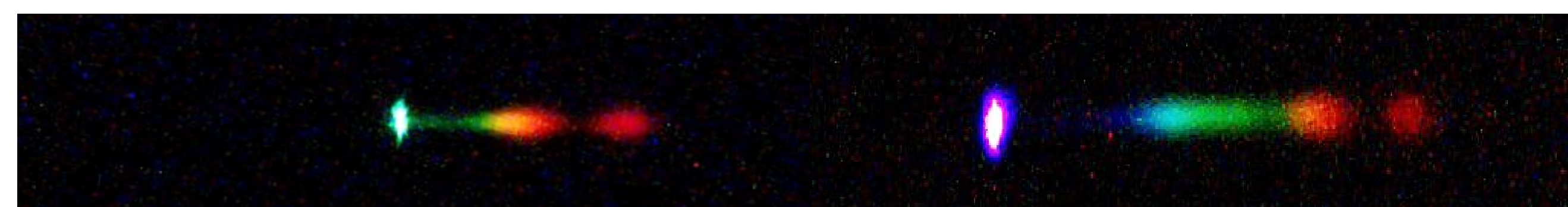
The pictures below show captured spectral lines of a helium discharge lamp used to calibrate the spectrometer resulting in the spectral intensity curve shown left of the spectral lines. Not bad for less than \$20 (computer not included!)



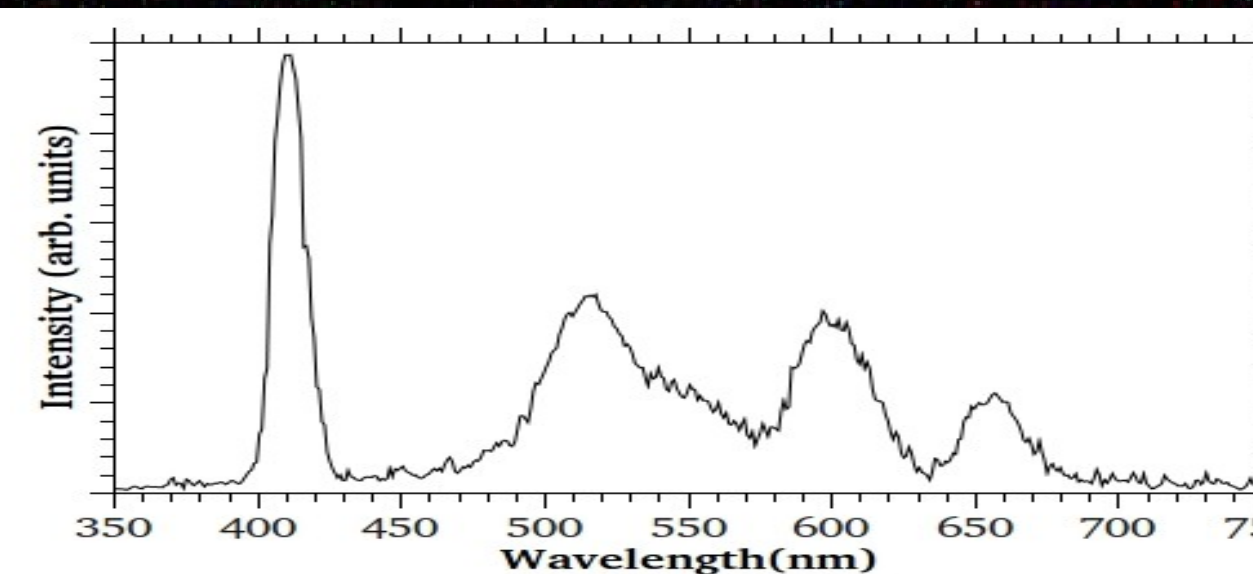
Red Play-Doh excited with Green LASER



Red Play-Doh excited with Violet LASER



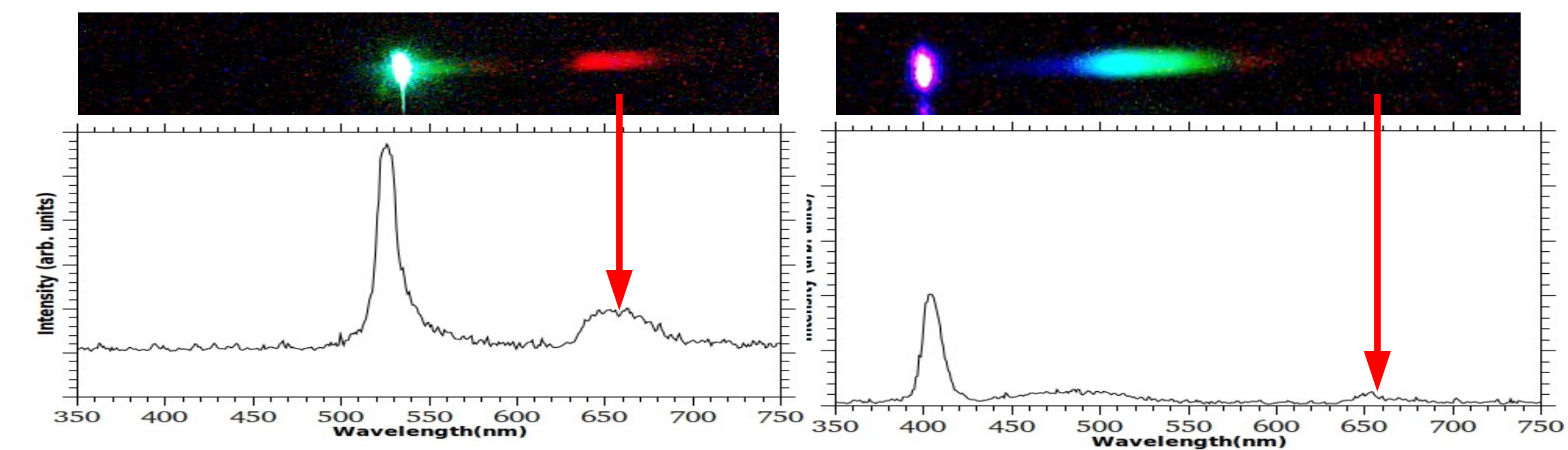
Orange Play-Doh excited with Green LASER



Orange Play-Doh excited with Violet LASER

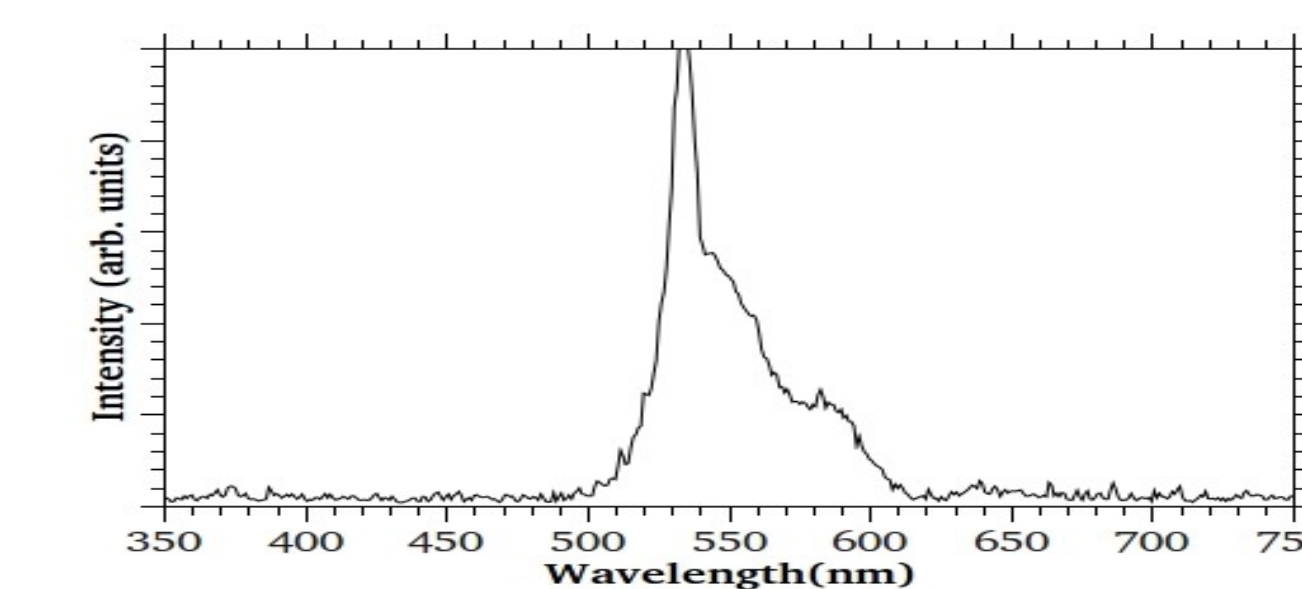
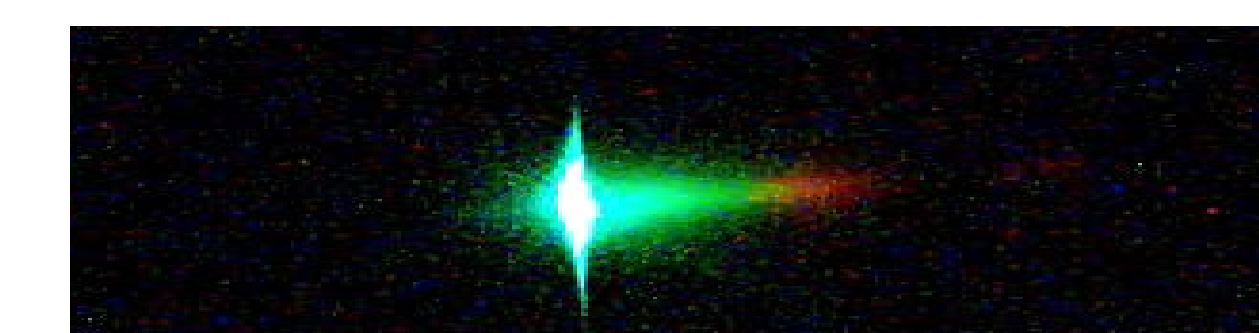
## Play-Doh Fluorescence

Play-Doh of the same color, when excited with different light sources fluoresces in different parts of the spectrum. As shown in the graphs for red, orange, yellow, green and blue Play-Doh.

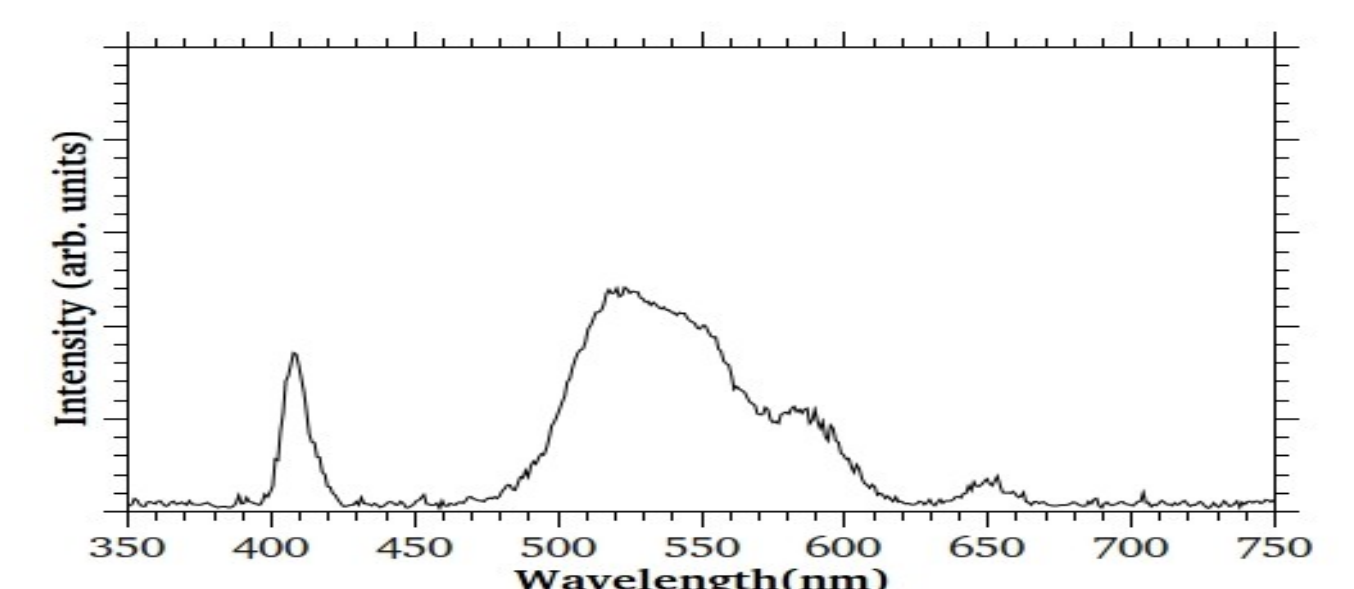
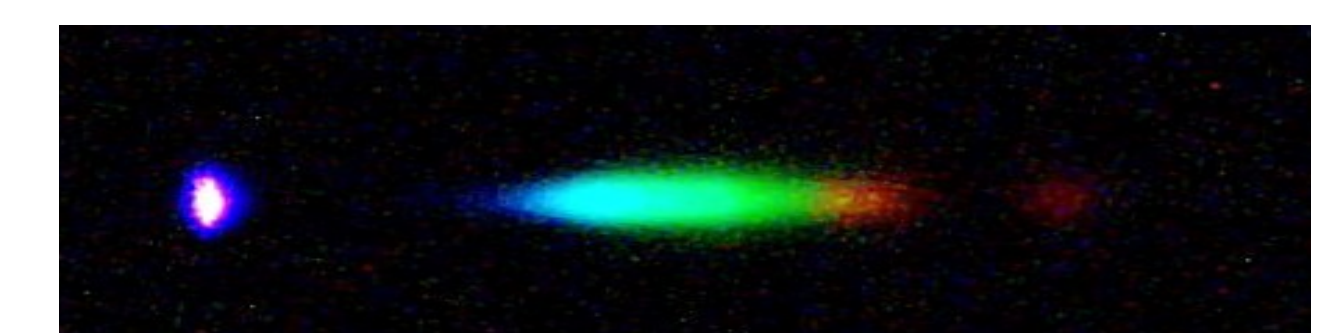


Yellow Play-Doh excited with Green LASER

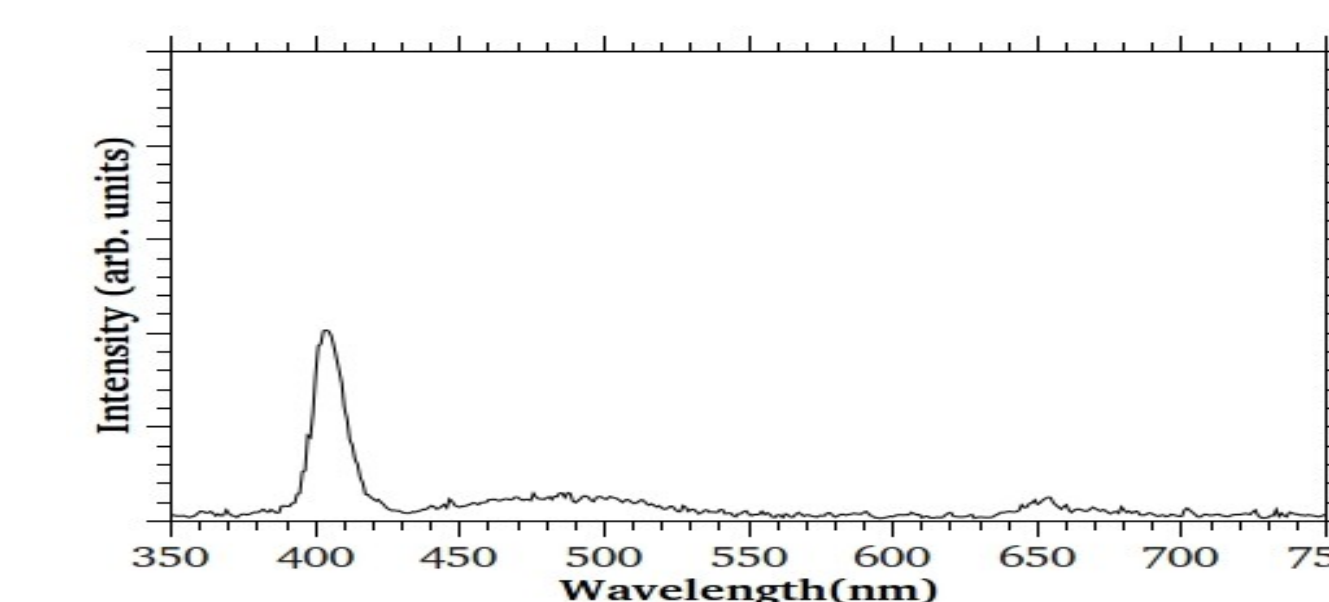
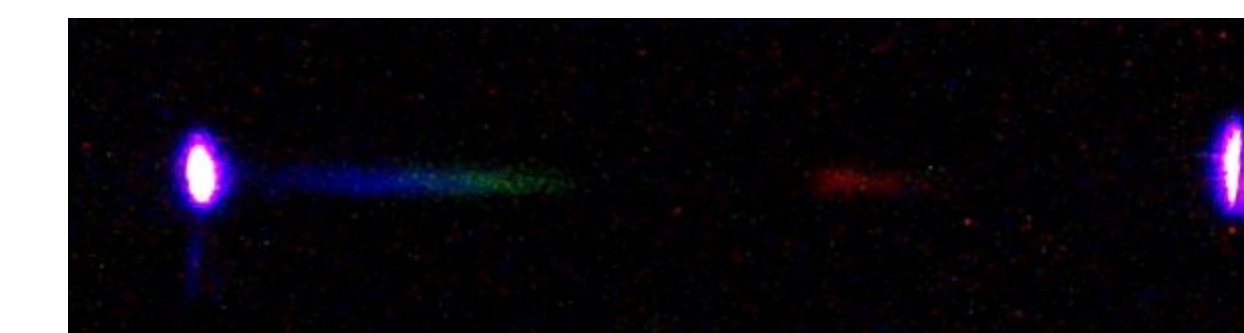
Yellow Play-Doh excited with Violet LASER



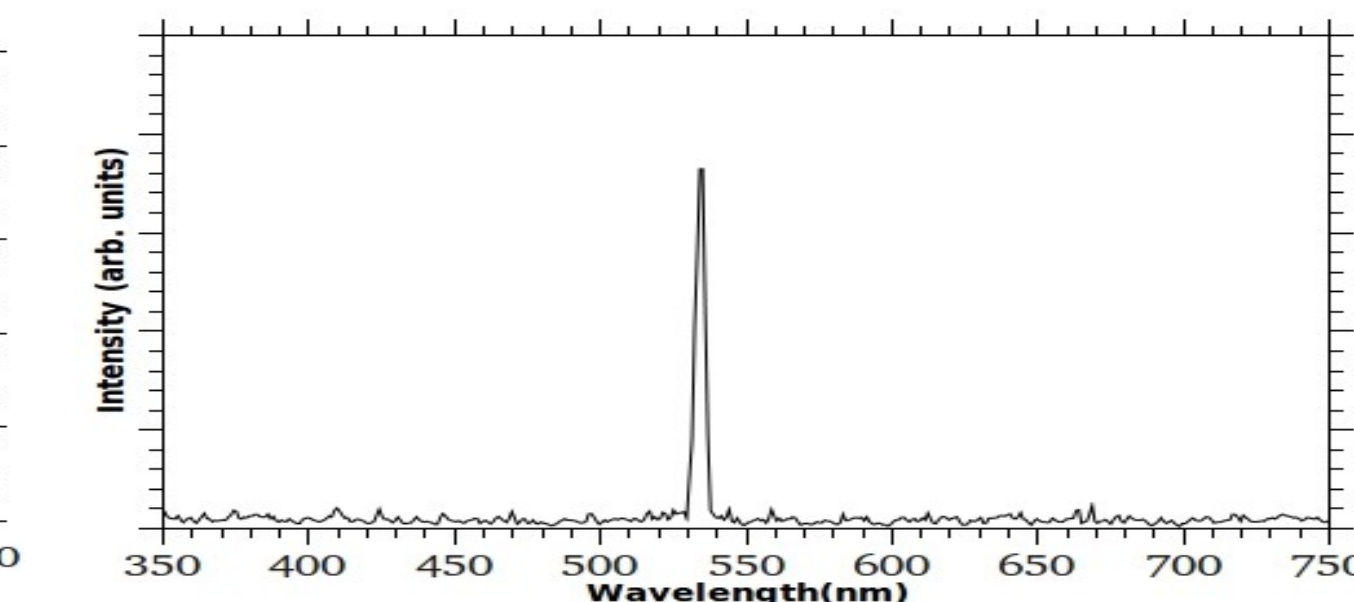
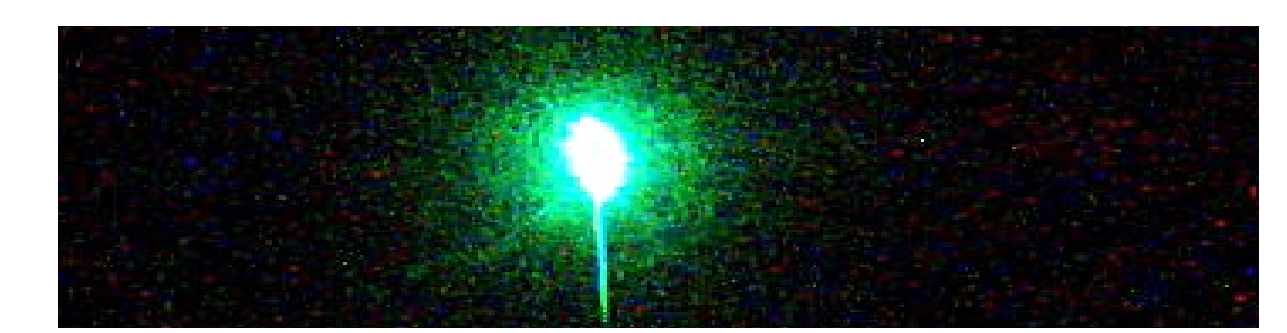
Green Play-Doh excited with Green LASER



Green Play-Doh excited with Violet LASER



Blue Play-Doh excited with Violet LASER



Blue Play-Doh excited with Green LASER

## Conclusion

We were able to use an inexpensive (<\$20) spectrometer to perform a legitimate spectroscopy experiment probing the dependence of fluorescence of Play-Doh on the wavelength of the laser exciting it.