

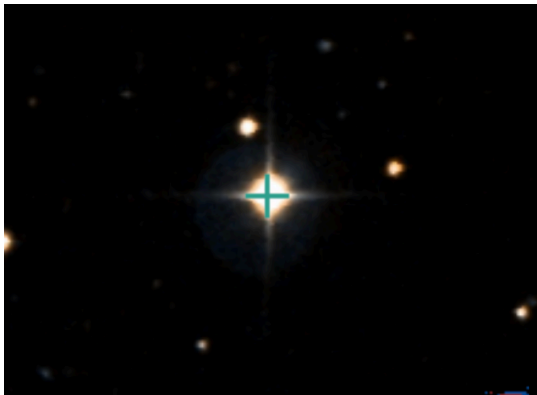
Observational astronomy AS.171.618 -- Spring 2020 -- Zakamska

Final homework / final project / final exam

Solve these astronomical mysteries (24 points max).

For every object, there is at least one data file. Plot the content of the data file as appropriate. **If the photometry is provided, display the photometry in the SED form (λF_λ or νF_ν).** Using all available information, try to figure out what, physically, is each object and explain your thinking. Explain what the emission mechanisms are. **1 point for plotting the data, 1 point for astronomical identification, 1 point for emission mechanisms, 1 point for describing the connection between the data you have and the properties / identification you infer.**

1. I am located at Galactic latitude $+73$ deg. My optical image is shown below. My photometry is available in object1_photometry.dat in Vega system. I am not detected in the radio or in the X-rays. I am variable, and my light curve is given in object1_lightcurve.dat (in the I band). What am I?

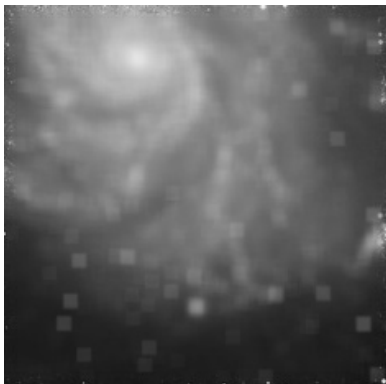


2. I am located at Galactic latitude $b=+10$ deg. Here is my optical image. My photometry is available in object2_photometry.tbl. I am variable and



my lightcurve is object2_lightcurve.csv. I am sometimes polarized at ~10% level and sometimes I am not. What am I?

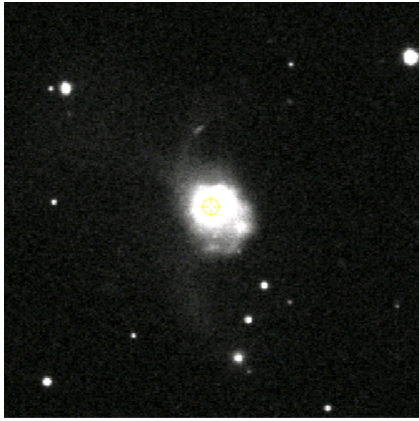
3. I am located at Galactic latitude +60 deg. My lightcurve is available in object3_lightcurve.dat. Here is an optical image centered on me taken before the data in the lightcurve. What am I?



4. I am located at Galactic latitude $b=+2$ deg. I am only detected in the radio. An optical image centered on my position is shown below, but the field is too crowded to tell if I have a specific optical counterpart. My lightcurve in the radio is given in object4_lightcurve.dat. What am I?



5. I am located at Galactic latitude $b=+60$ deg. My V-band optical image is shown below. My photometry is given in object5_photometry.tbl. I do not vary much. What am I?



6. I am located at Galactic latitude $b = -15$ deg. My optical image and spectrum are shown below. I vary, my light curve is given in `object6_lightcurve.csv`. My photometry is given in `object6_photometry.dat`. What am I?

