Dust Attenuation/Extinction

- What are we learning from IRX-beta?
  - Geometry, dust composition, size distribution, star formation history, stellar population age, metallicity, inclination, the list goes on!
  - Should we give up on IRX-beta?!

- What are the next steps to constrain the attenuation curve of galaxies? Or are we good by just using flexible curves (Veronique Buat talk)?
Star Formation Rates

- What is the minimum needed data to believe the estimated SFR of a galaxy (to account for their unobscured and obscured stellar population)?
- Are we confident of our SFR calibrations over the wide range of dust content, metallicity, star formation history, etc., that we commonly use them for?
  - UV
  - Mid-IR (PAHs, JD Smith’s favorite)
  - Far-IR (evolving IR SEDs?)
  - Nebular lines (which ones)
  - Radio
  - Or the only path to success is full SED modeling?!
- Can we trust the local calibrations at z>5? In ULIRGSs/SMGs?
Dust Masses

• What is the minimum needed data to estimate dust mass of a galaxy?

• How to deal with the uncertainty in “dust temperature”? (evolving IR SED!)

• Can we trust the local calibrations and dust scaling relations at z>5?
Dust/Gas ratio, Dust/Metal ratio, PAH fraction (and their variation with metallicity)

• Do we fully understand these at z=0?
  – If not where is most work needed?

• Do the z~0 relations hold at higher redshifts, given that we know that by cosmic noon:
  – Metallicities are lower (at a given stellar mass)
  – Electron densities are higher, SF clumps are more massive and compact
  – O/Fe is enhanced etc etc (IMF?!)

The *intentionally* vague title of Dust, Gas, and Metals!