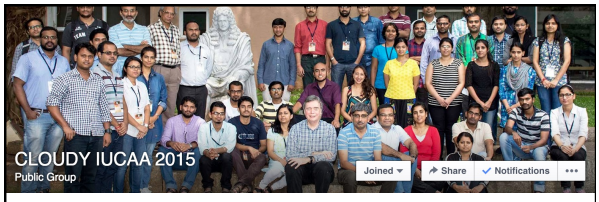

- Cloudy IUCAA 2015
  - Please post your photos!
- **Group photos posted on the ftp site**
- **I will post this morning's talks on the site if the speakers send me a file**
- **Tomorrow's session will discuss questions posted on workshop discussion board**

Group projects

- **Workshop ends with ~20 minute long group presentation tomorrow afternoon**
- **Final group product is poster to be placed on the workshop participant page**
  - IUCAA 2015 participant page
  - Previous workshop participant page
- **One-page portrait PDF to post on workshop web site**
  - Project title
  - Names & affiliations of all participants
  - Results, figures, & conclusions

Three cases

- **hiis.in – set radiation field, all physics self consistent**
- **coronal.in – no radiation, but gas kinetic temperature set by external physics. Ionization and emission set by gas kinetic temperature**
- **constant temperature models – will include radiation but kinetic temperature set by external physics. Ionization determined by both radiation field and gas temperature**
  - Hazy1 Chap 11

Vary Metals – constant temperature

- **Set constant temperature, look at [O III] lines relative to Hβ as metallicity Z (and O/H) varies**
- **varyZct on ftp**

Thermostat effect

- **Vary metals with temperature balance**
  - varyZ.in
- **Look at line ratios, temperature vs Z**
- **Cooling and heating vs Z**
- **Thermostat effect – line spectrum does not change dramatically when Z changes**
  - Heating and cooling are equal
  - Cooling is mainly O III lines
  - So they are constant when they are the main coolant

Three-phase pressure stability

- **tsuite / auto / ism_grid**
- **Look at kinetic temperature, gas pressure, vs density**
- **Two stable phases present**

Recombination & collisionally excited line vs $T_{kinetic}$

- **Recombination: H I, He I, He II lines in optical, NIR**
  - Radiative recombination rate depends on inverse power of temperature, typically $T^{-0.7}$
  - So weak dependence on gas temperature
- **Collisionally excited: strong lines of heavy elements**
  - Collisional excitation rate depends on Boltzmann factor, so exponential temperature dependence

Vary blackbody temperature

- **Photoelectric heating vs Tstar**
- **Gas temperature vs Tstar**
- **O spectrum vs Tstar**
- **He spectrum vs Tstar**
- **Number of LineList* files in data/**