Talks by topic

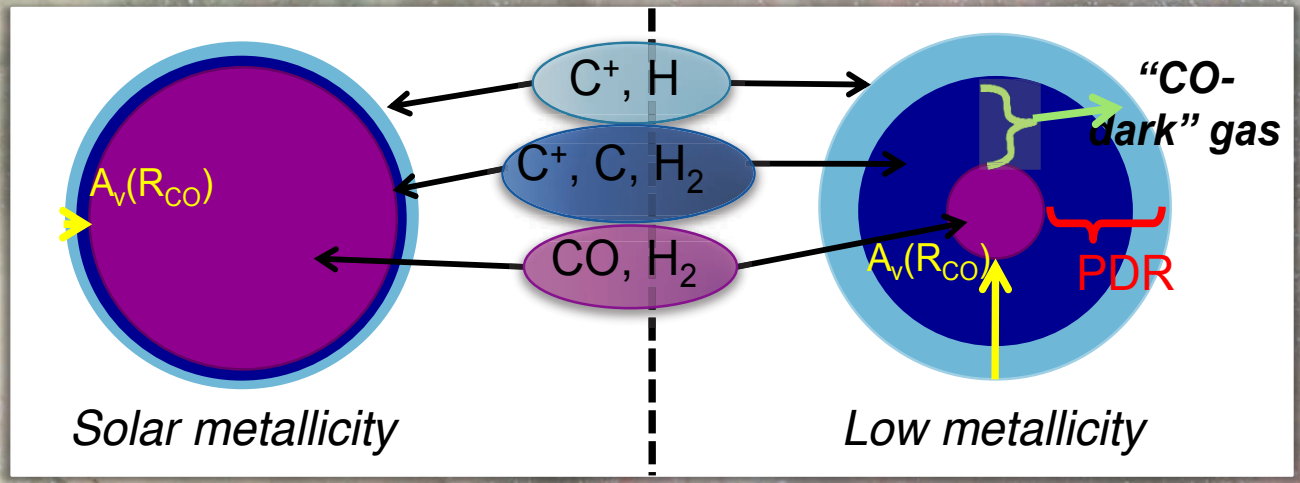
- **HII Regions**
  - Chevance, Fernandez, Sitotaw, Tyndal, Wu
- **PN**
  - Alharbi, Boyle, Harvey
- **Stars, endpoints stellar evolution**
  - Jurkic, Magee, Yano
- **AGN BLR**
  - Kenyon, Martinez-Aldama, Suvendu
- **NLR, IGM**
  - Quiret, Smith, Wildy

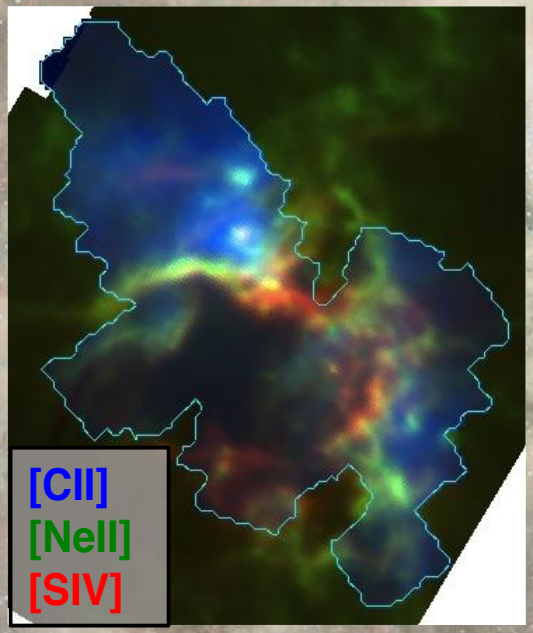
HII Regions

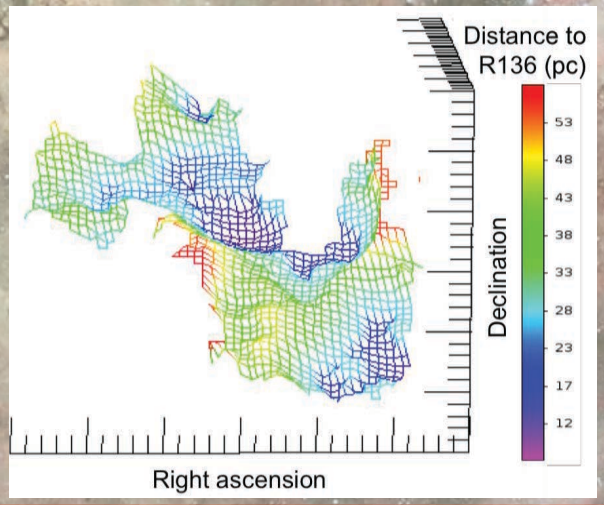
- Chevance,
- Fernandez,
- Sitotaw,
- Tyndal
- Wu

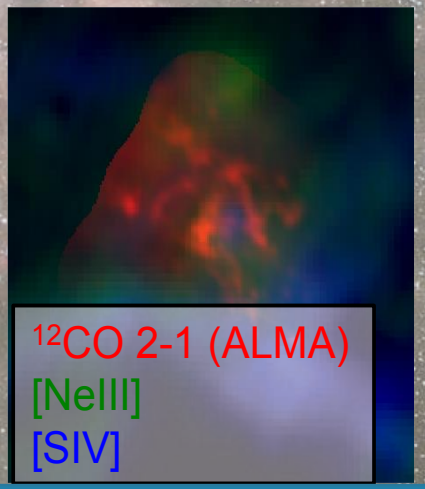
Study of the physical processes in the interstellar medium of the Magellanic clouds.

Mélanie Chevance
2nd year of PhD
CEA/AIM – FRANCE
Advisor : Suzanne Madden









IR /sub-millimeter lines (Herschel)

PDR and Photoionization models (Meudon, Cloudy)

Physical parameters (density, incident flux…) and 3D structure of the ISM.

Effects of the metallicity on the structure of the ISM ?

Primordial Helium abundance determination thr[16]Ough altern[14]Native method[32]S

(Vital G. Fernández, Supervisors: E. Terlevich, F. Rosales-Ortega,)

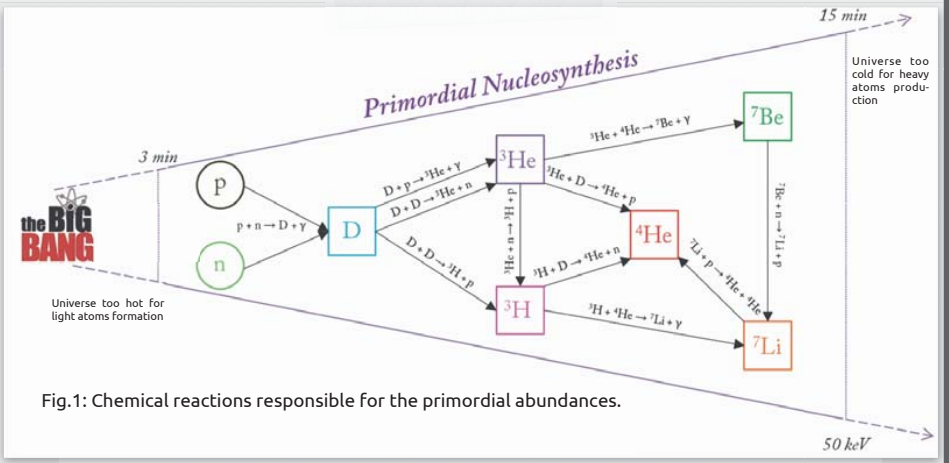
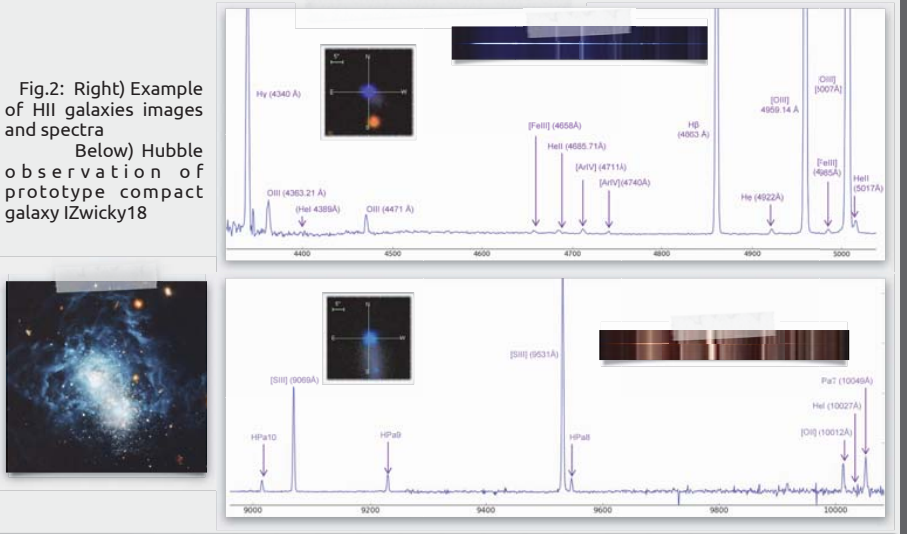


Fig.1: Chemical reactions responsible for the primordial abundances.

$X_{P\ (Hydrogen)} = 0.7515$ $Y_{P\ (Helium)} = 0.2485$ $Z_{P\ (Heavy\ Elements)} = 0.0$

Fig.2: Right) Example of HII galaxies images and spectra

Below) Hubble observation of prototype compact galaxy IZwicky18



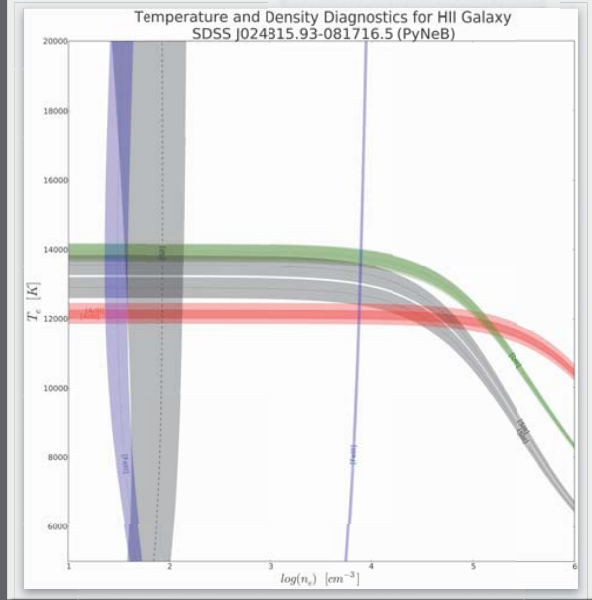


Fig.3: Application of Pyneb library to determine a nebula temperature and density based on its spectrum emission lines. The atomic diagnostics include Oxygen, Sulphur, Iron and Argon.

Once these physical properties are known it is posible to determine the chemical abundances for each element ion.

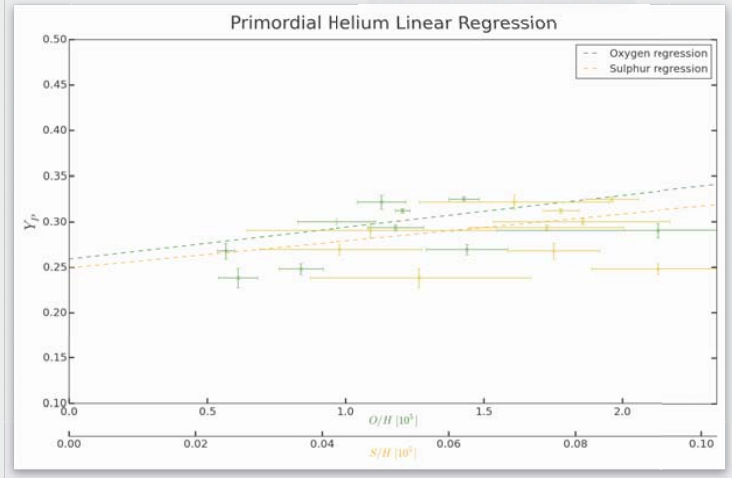
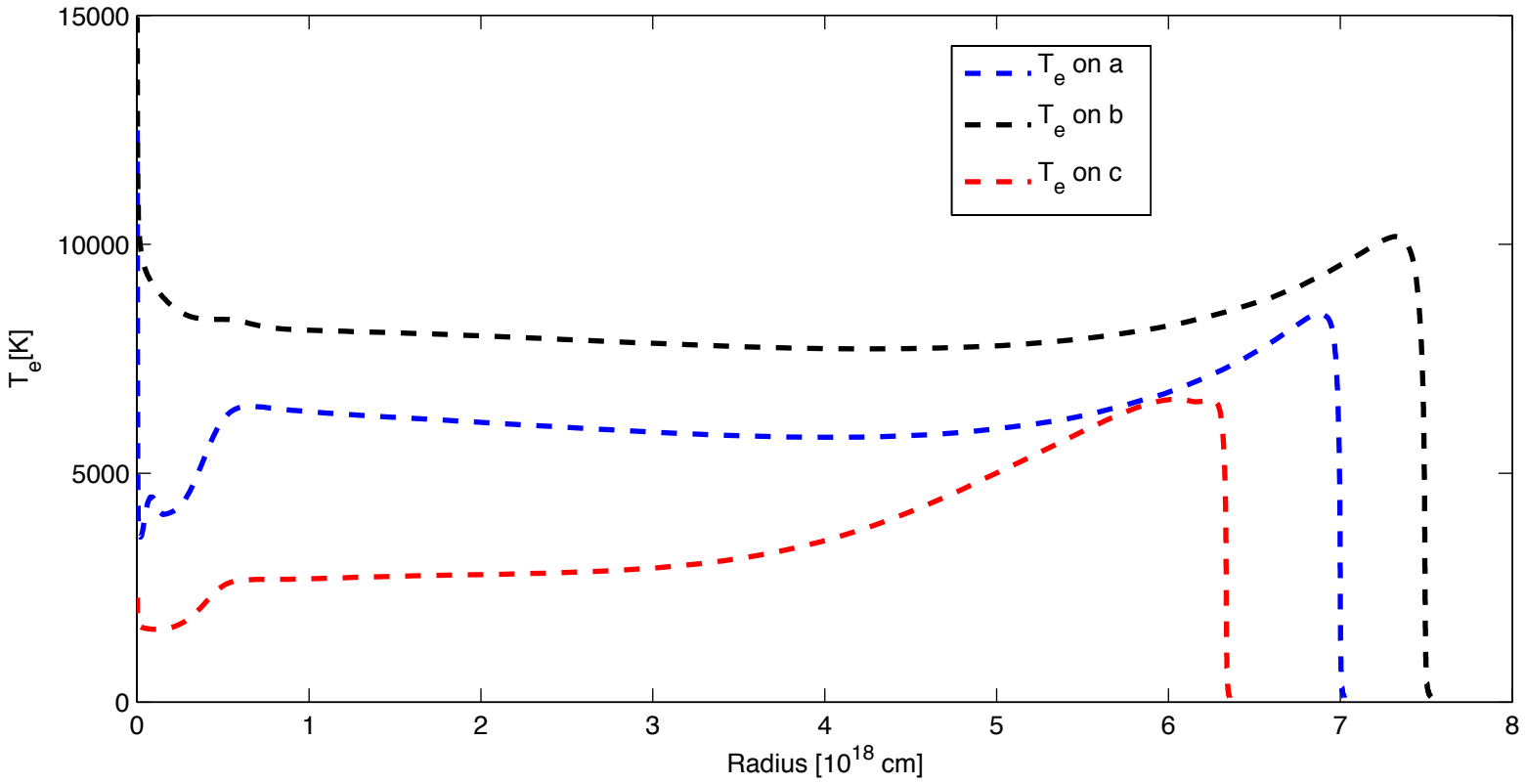


Fig.4: To determine Y_P, we perform a linear regression on the Helium abundance vs metallic abundance plot.

This technique is physically based on the zero metals abundance before the stellar nucleosynthesis.

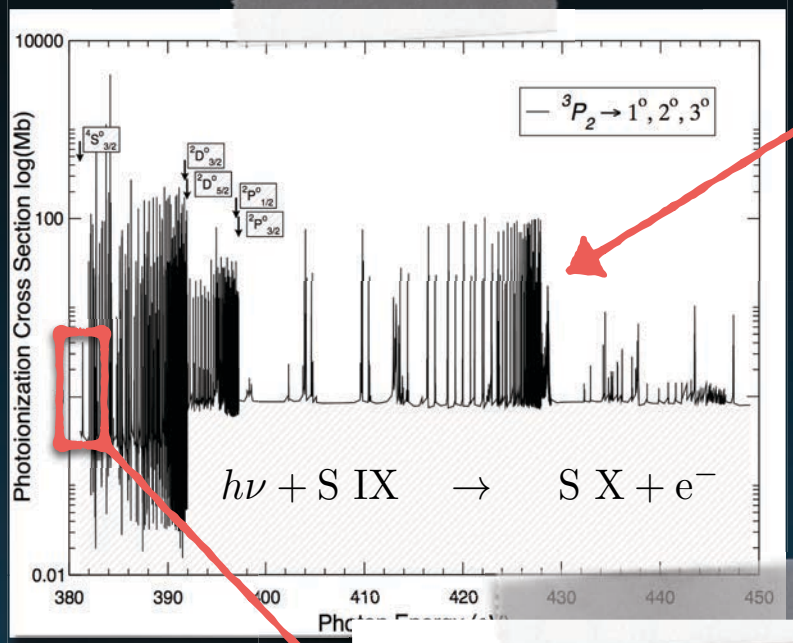
The main project novelty consists in applying the linear regression using several metals to confirm the estimation quality. This scheme has already been applied with Oxygen and Nitrogen, and now, on the left plot, we present the comparison between Oxygen and Sulphur

Sitotaw


15000
10000
5000
0
T_e[K]
0
1
2
3
4
5
6
7
8
Radius [10^{18} cm]
T_e on a
T_e on b
T_e on c

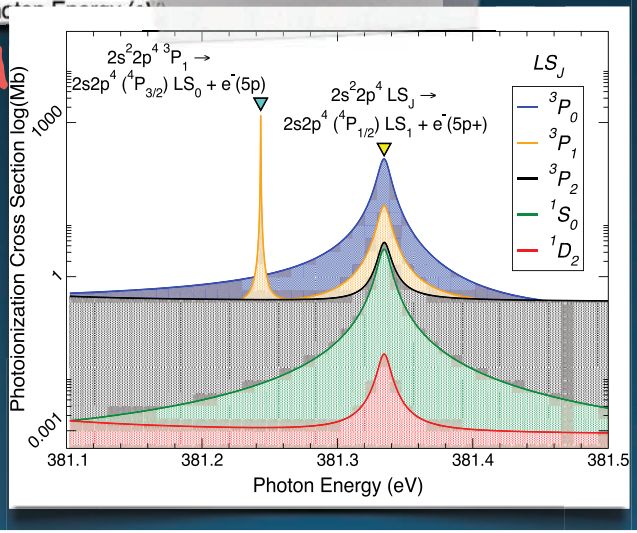
Computation of Photoionization Cross Sections via the R-Matrix Method

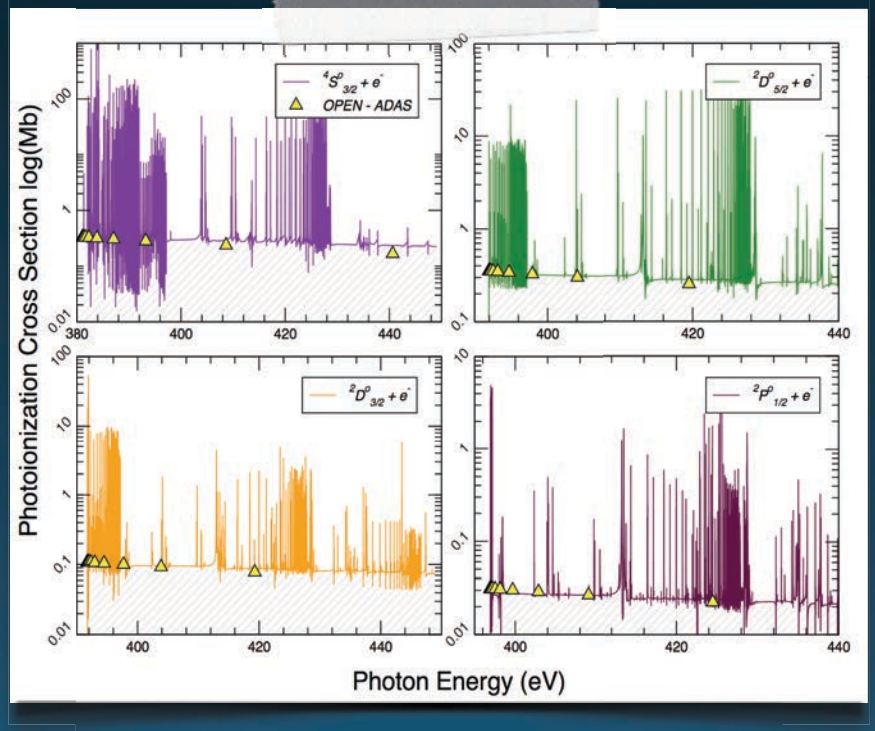
Niall Tyndall
Queens University Belfast



$$\sigma = \frac{4}{3}\frac{\pi\alpha_0 a_0^2 \omega}{g_i}\sum(\Psi_f^-||\mathbf{D}||\Psi_i)$$

- Fundamental atomic processes the R-matrix method
- Consider a two region problem
- Build up atomic structure of target ion
- Compute various allowed transitions
- Analyse resonance features of spectrum



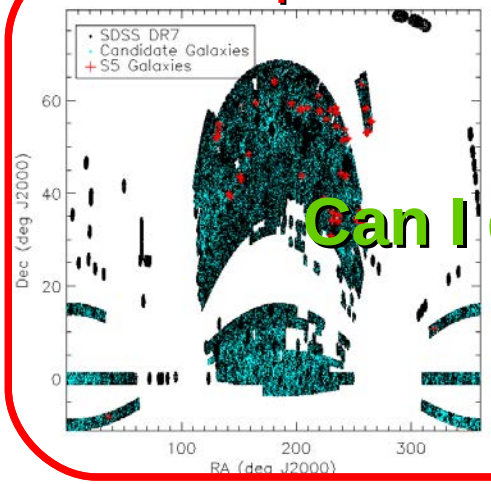


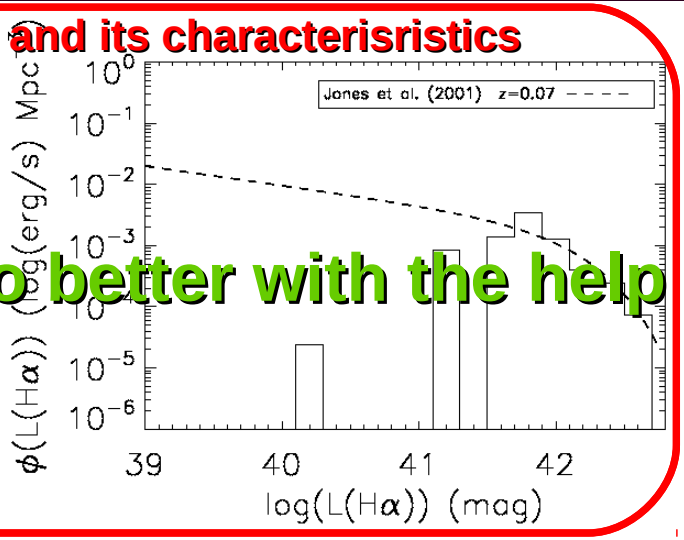
Ronin Wu

JSPS Postdoctoral Fellow, the University of Tokyo

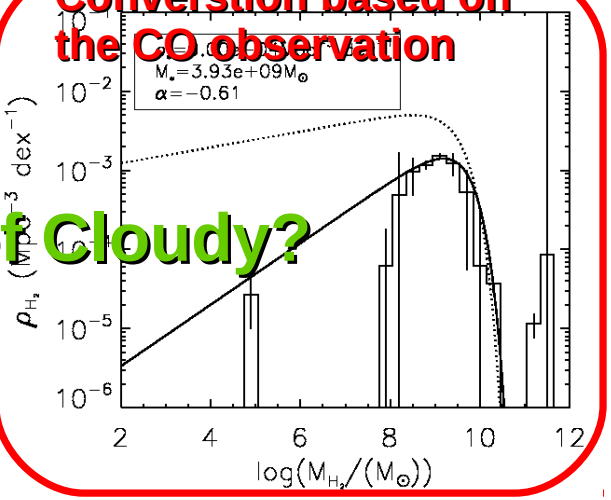
Project I: The Spitzer SDSS Statistical Spectroscopic Survey (S5): 292 galaxies ($0.05 < z < 0.1$; $F(H_\alpha) > 3\times10^{-15}$ erg s^{-1} cm^{-2})

Sample selection and its characterisristics



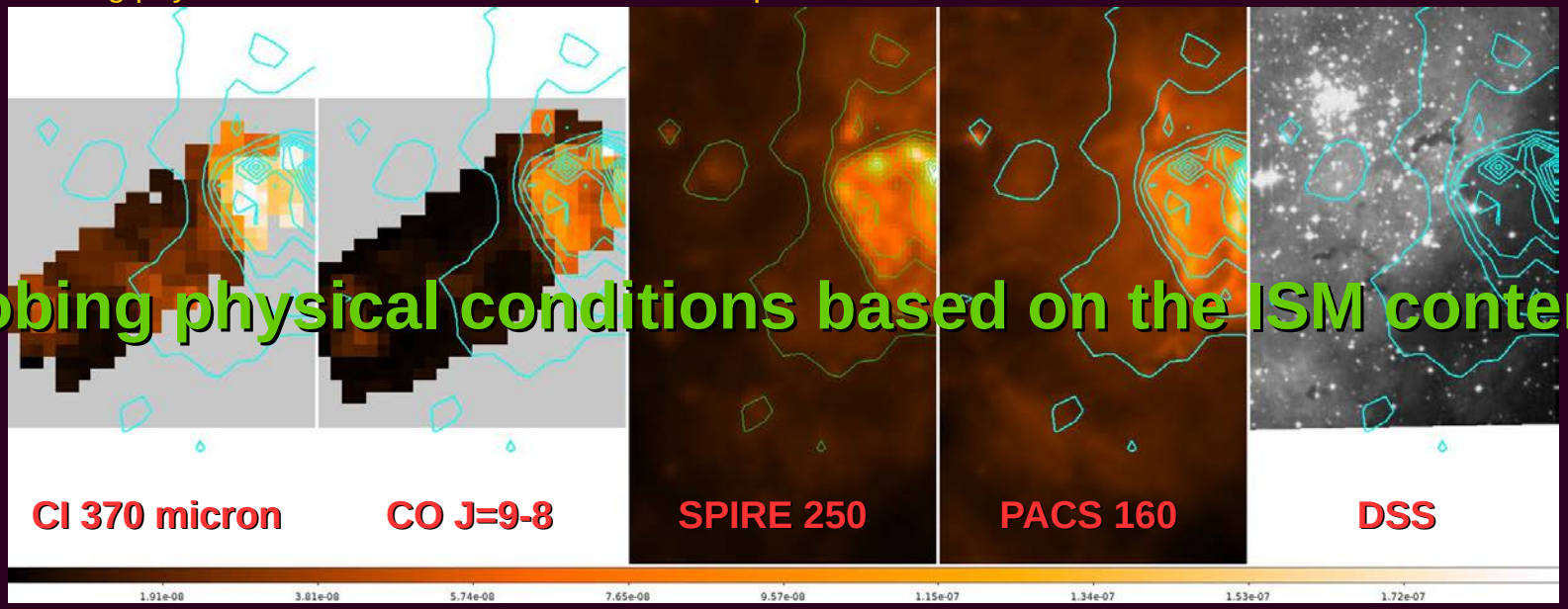


Converstion based on the CO observation



Can I do better with the help of Cloudy?

Project II: Deriving physical conditions of the PDR near Trumpler 14 of the Carina nebula.



Probing physical conditions based on the ISM contents

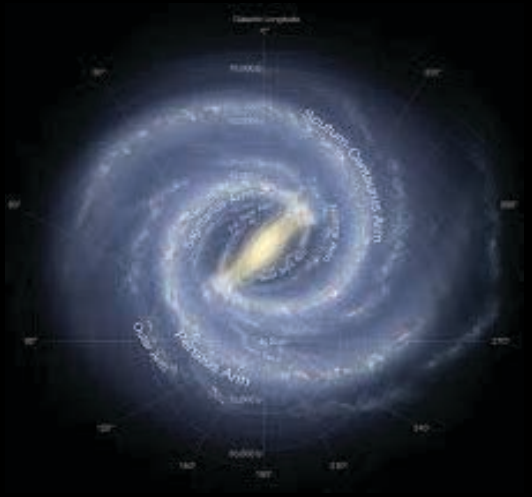
PN

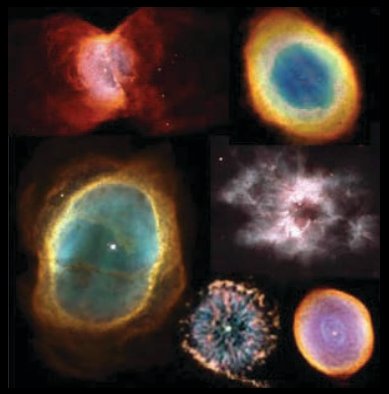
- **Alharbi, Boyle, Harvey**

Planetary Nebulae in the Southern Milky Way

Samira Alharbi - 1st year PhD – Manchester

CLOUDY Winter School – Belfast 2015





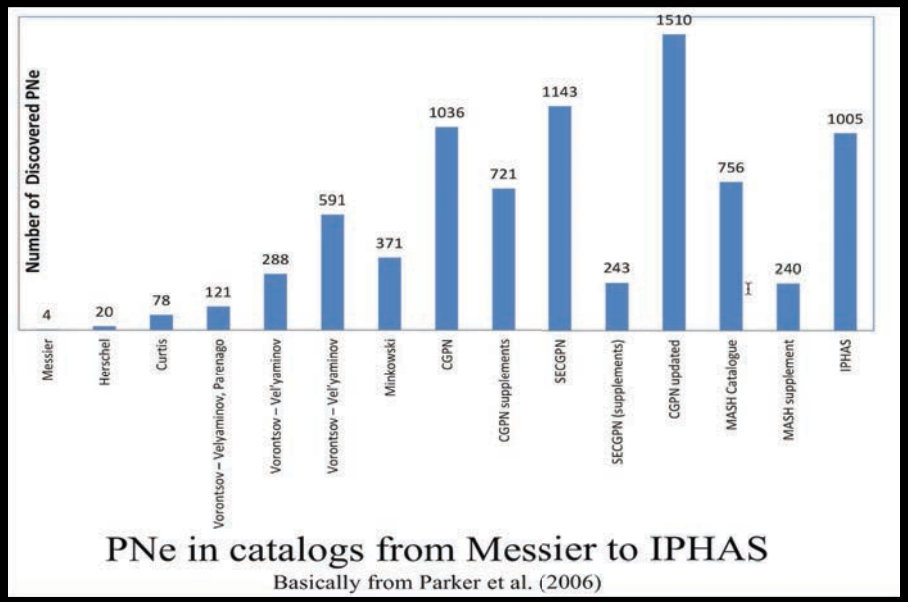
EGAPS

EUROPEAN GALACTIC PLANE SURVEYS

THE INT PHOTOMETRIC Hα SURVEY

IPHAS

OF THE NORTHERN GALACTIC PLANE



PNe in catalogs from Messier to IPHAS

Basically from Parker et al. (2006)

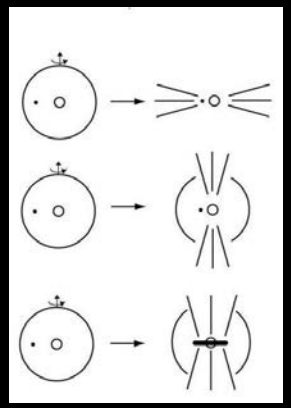
THE VST PHOTOMETRIC Hα SURVEY

VPHAS+

OF THE SOUTHERN GALACTIC PLANE

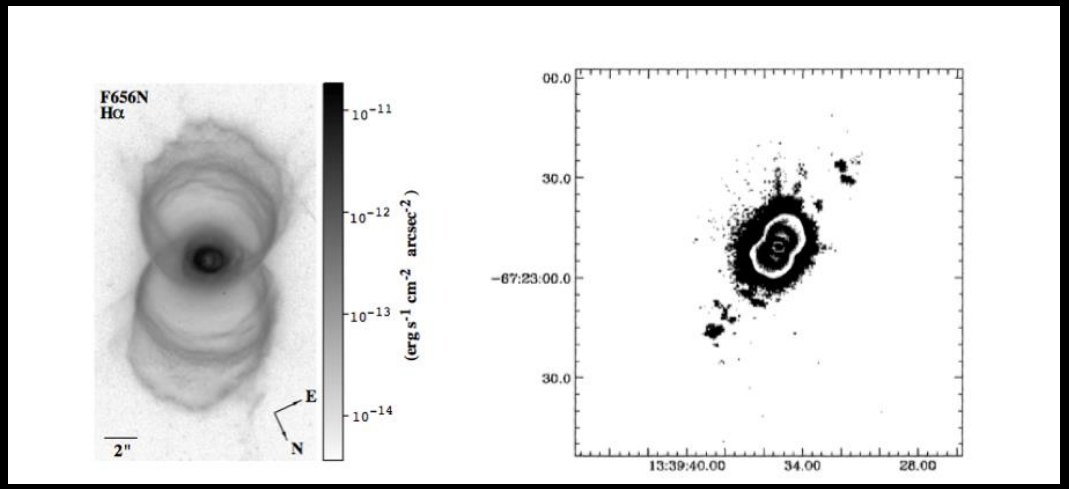
Laura Boyle
National University of Ireland, Galway
PhD Topic: Planet Destruction and The Shaping of Planetary Nebulae
Supervisor: Dr. Matt Redman

Do massive planets affect the morphology of outflows in Planetary Nebulae?



← Engulfed planet may be tidally destroyed, leading to an accretion induced outflow event

Resulting in an asymmetrical PN→



From studying the spectra of PNe, it may be possible to distinguish the chemical signatures of destroyed planets

Kindly funded by the Irish Research Council