

Abundances
of two planetary nebulae populations
towards the Galactic center

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Observational data

Górny (observed in 2000)

- * 44 objects observed with 1.9m SAAO telescope
- * main aim - search for new [WR] c.s.



- * selection effects:
 - unknown c.s. type
 - selected IRAS colours

Observational data

Górny 2000

Cuisinier et al. (2000) - 30 objects

Observational data

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Cuisinier et al. (2000)

Escudero & Costa (2001) - 45 objects

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- from Beaulieu et al. 1999
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Cuisinier et al. (2000)

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Escudero et al. (2004) - 57 objects

Observational data

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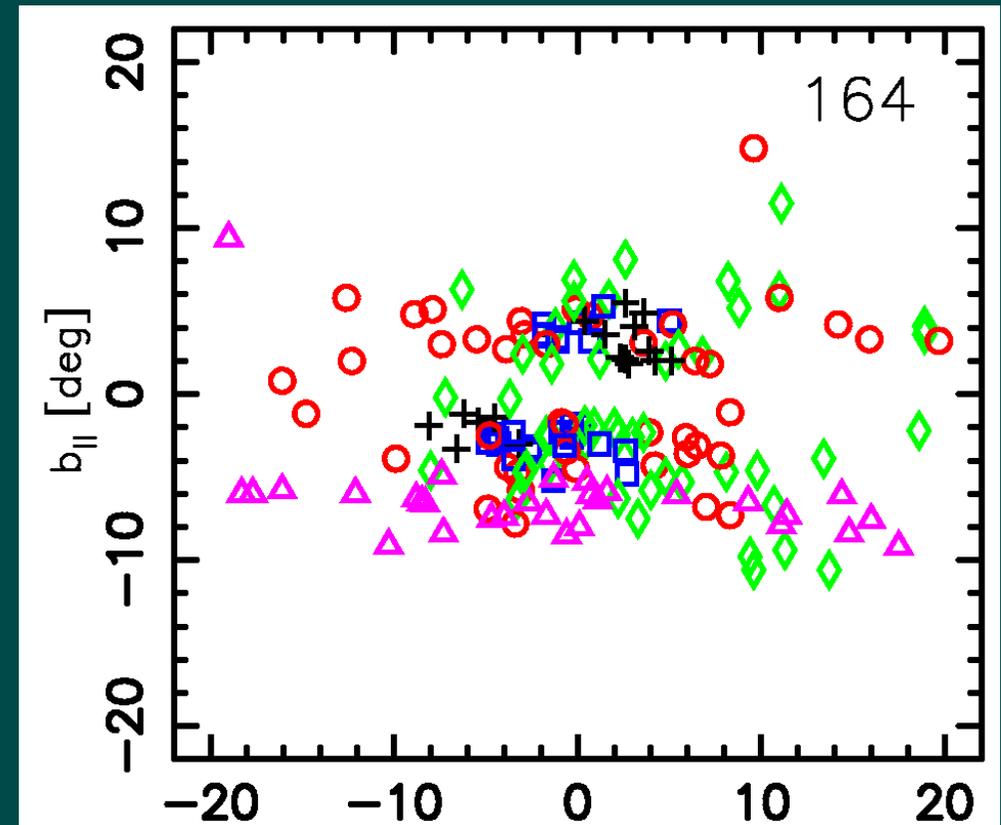
Escudero et al. (2004)

-> different mean properties

-> none is complete in any sense

Observational data

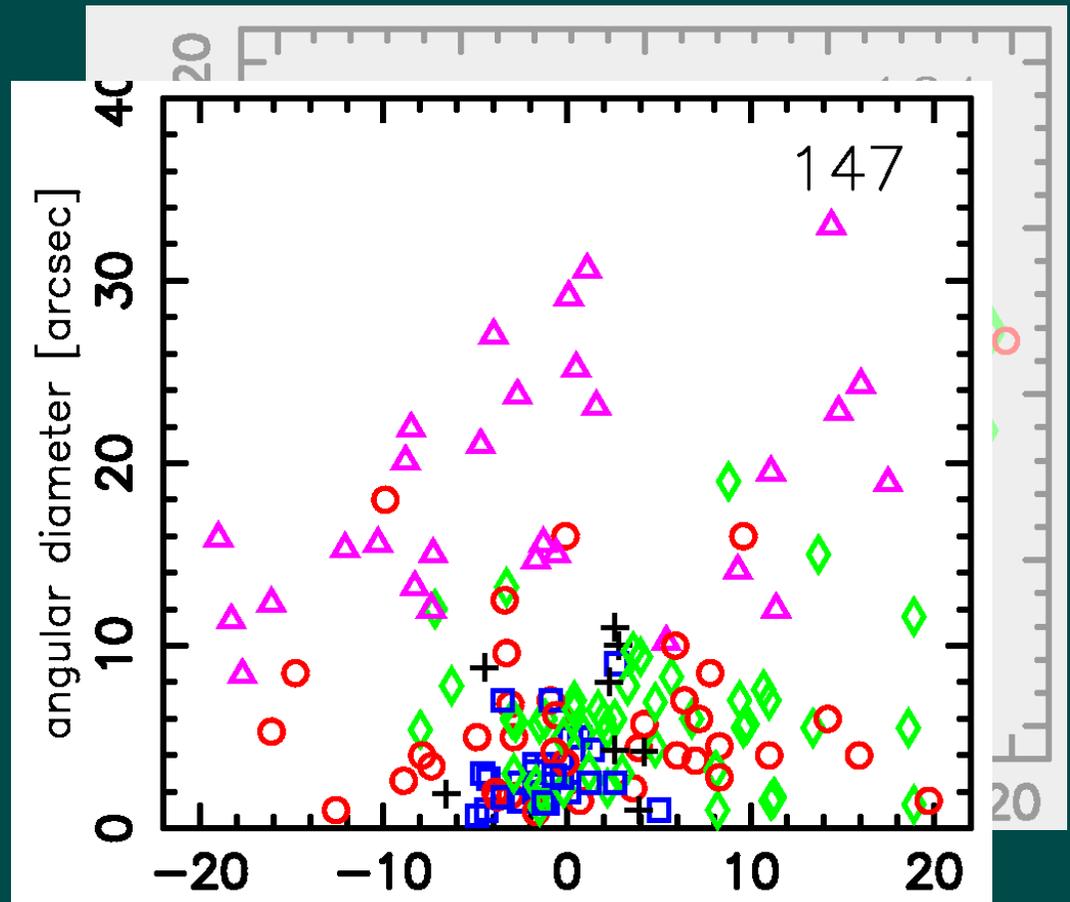
-  Górný 2000
-  Cuisinier et al. (2000)
- Escudero & Costa (2001)
-  - from Beaulieu et al. 1999
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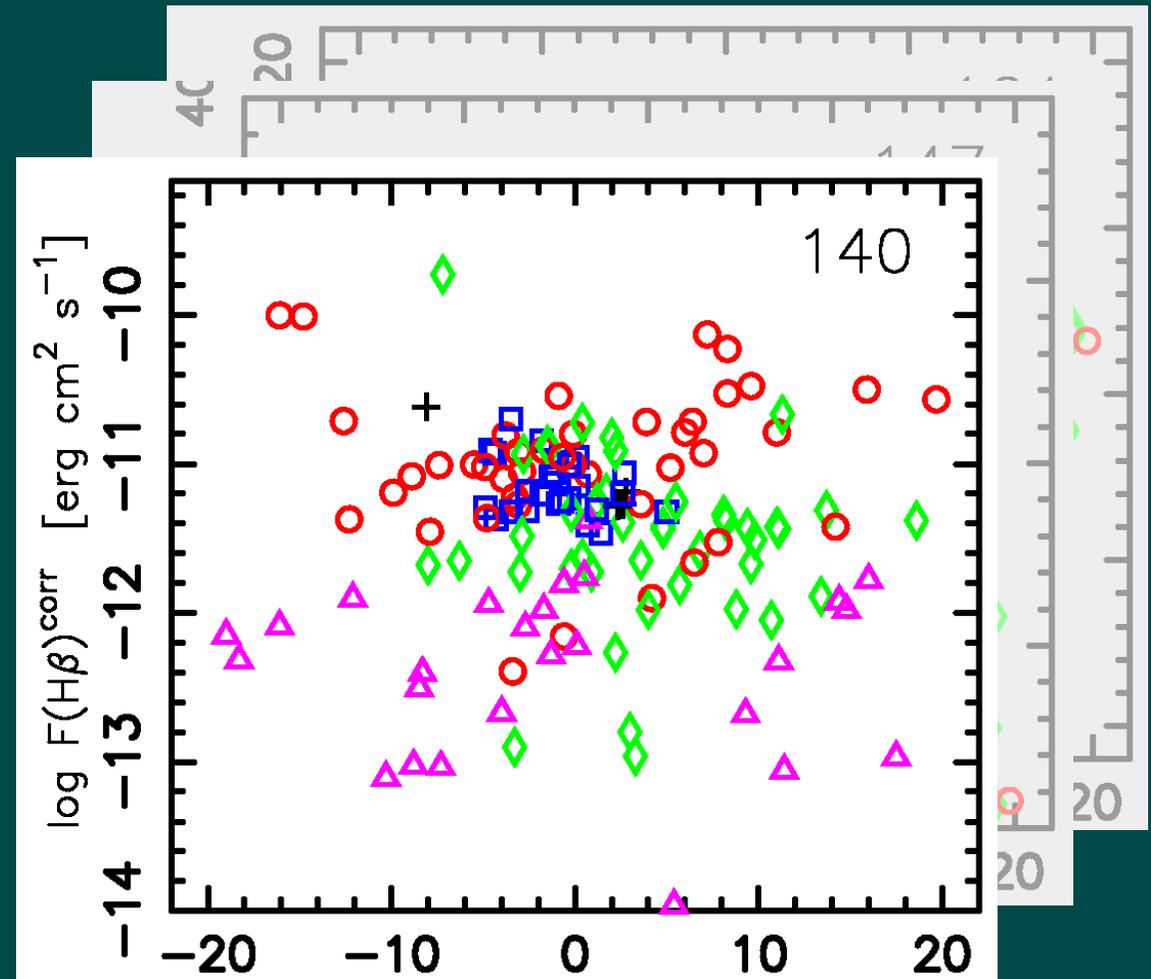
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} 95% physically related
(Stasińska et al. 1991)

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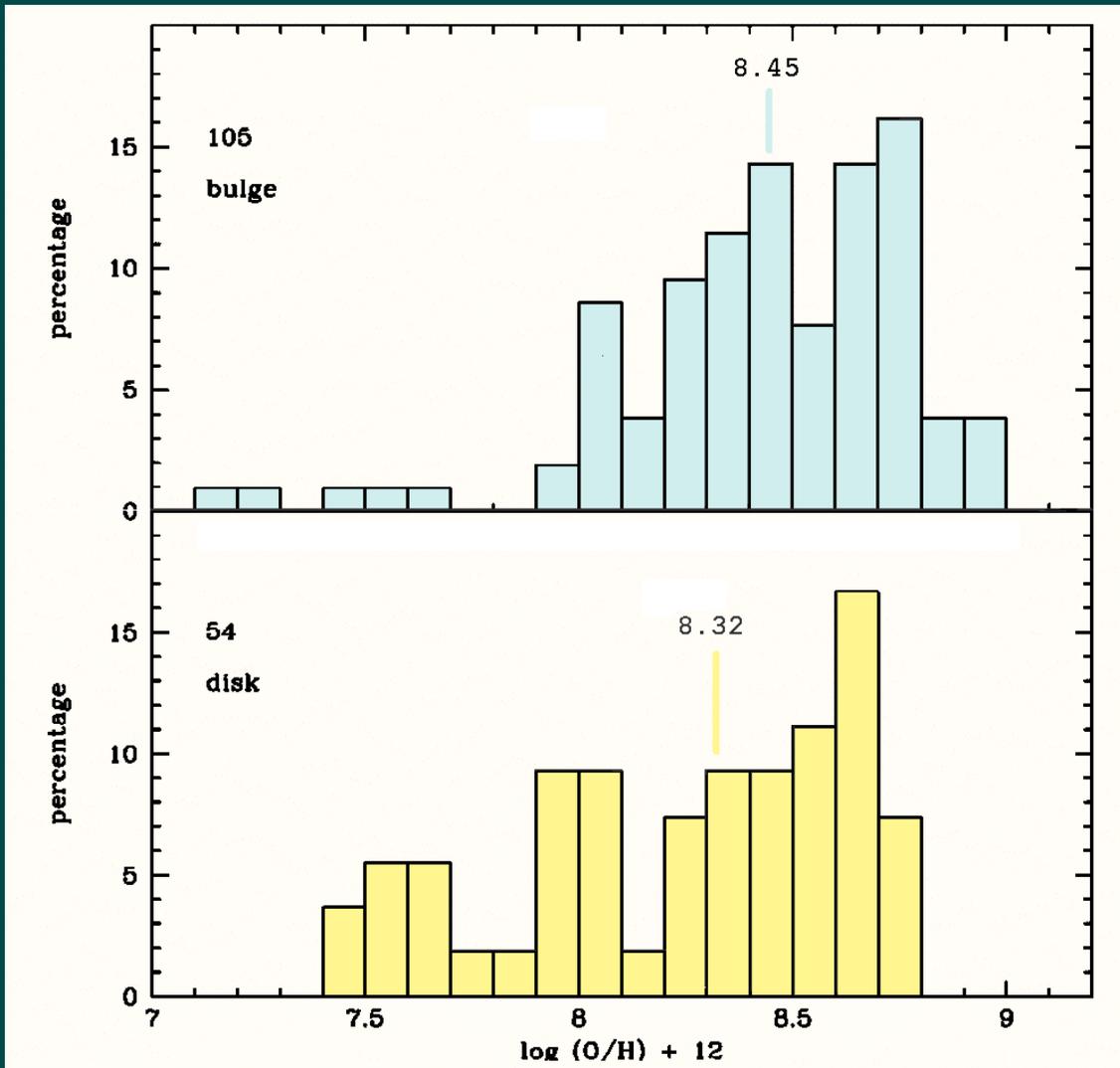
-> distinction without use of radial velocities

Abundance determination

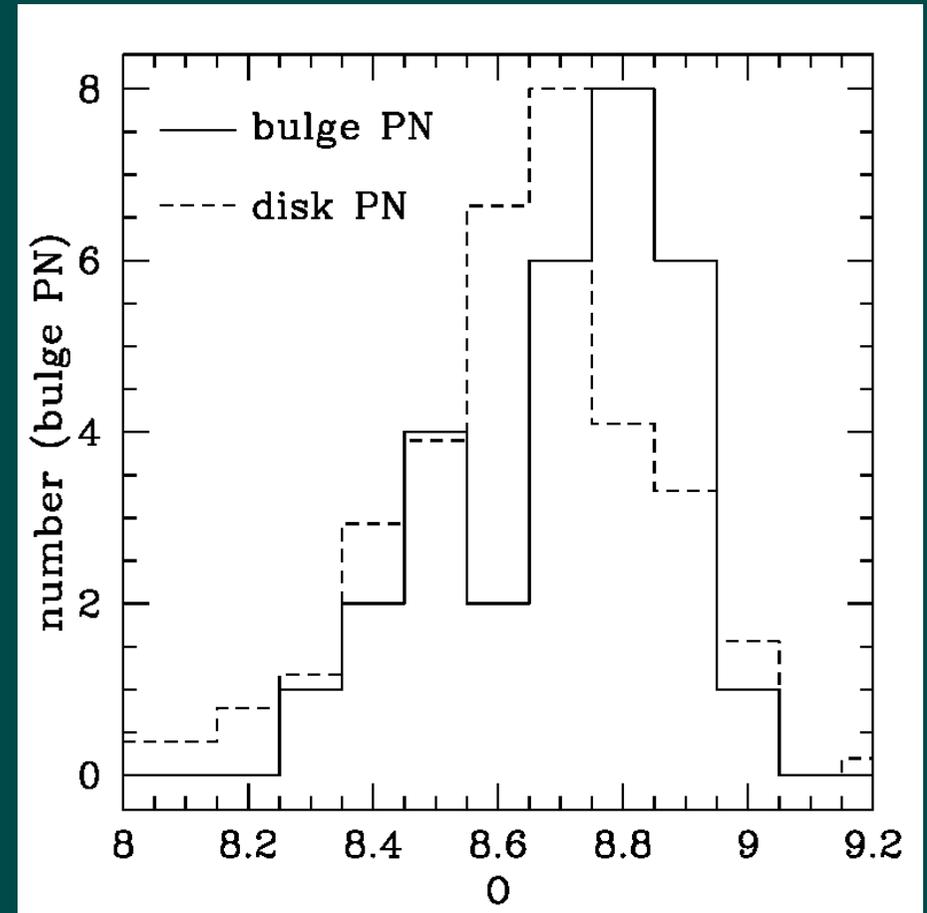
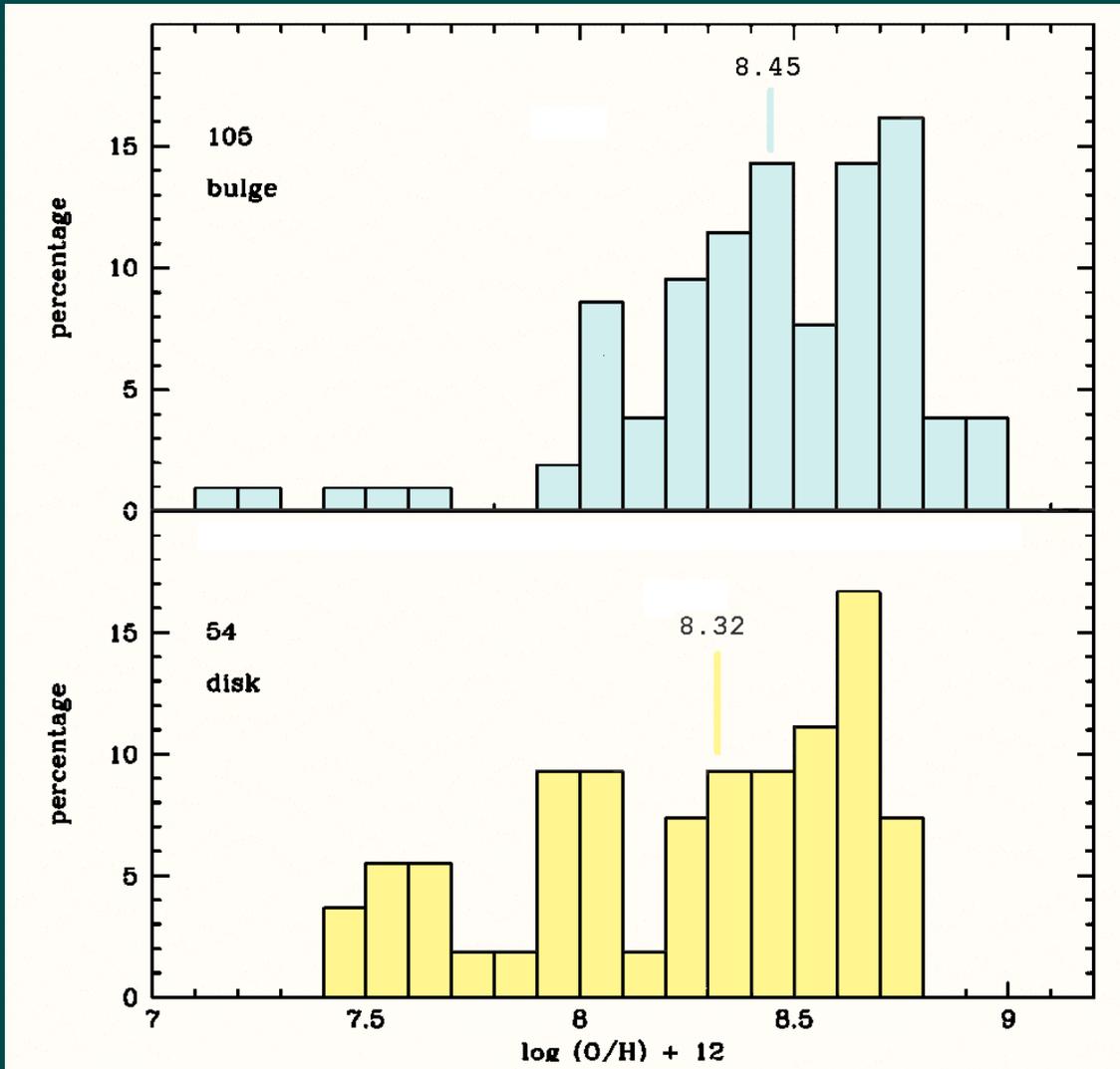
Classical empirical method (code ABELION):

- electron densities from [S II] 6731/6717
 - electron temperature [O III] 4363/5007
[N II] 5755/6584
 - T_e ([N II]) for low and T_e ([O III]) for high ionization potential
 - O^+ adopted as mean of [O II] 3727 and [O II] 7325
- Abundances derived using the same method for all samples to obtain homogenous set of abundances

Results

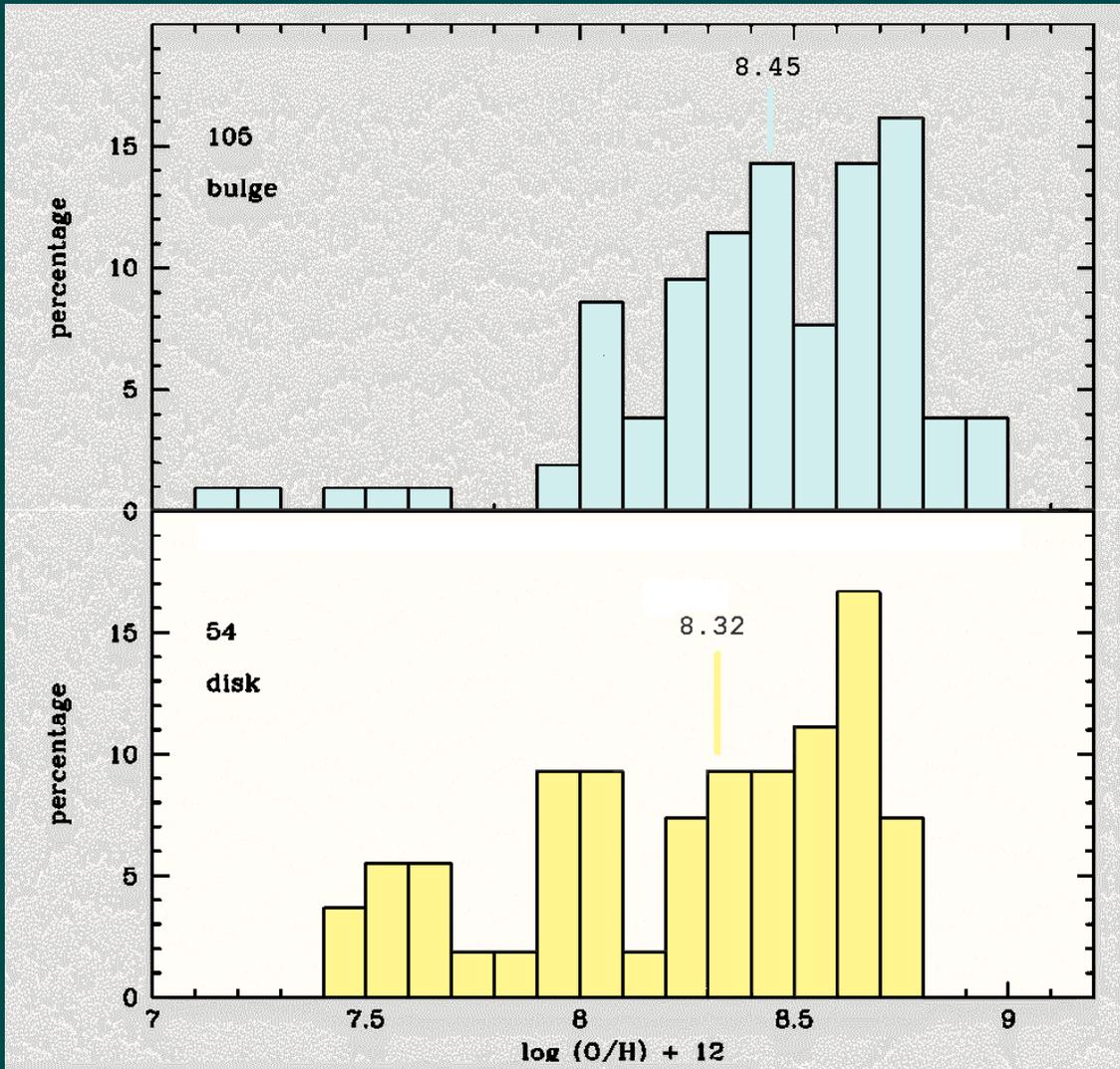


Results

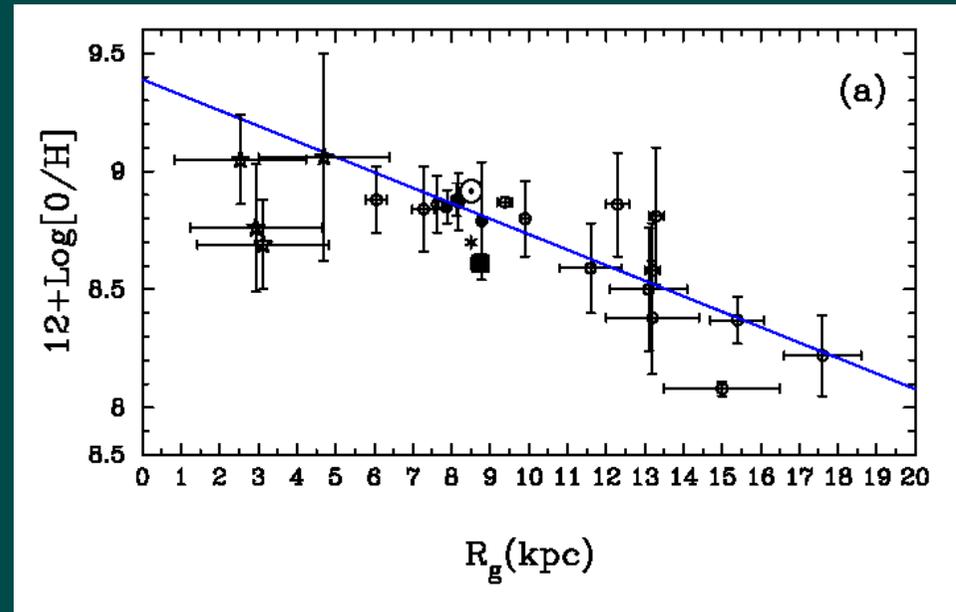


Cuisinier et al. (2000)

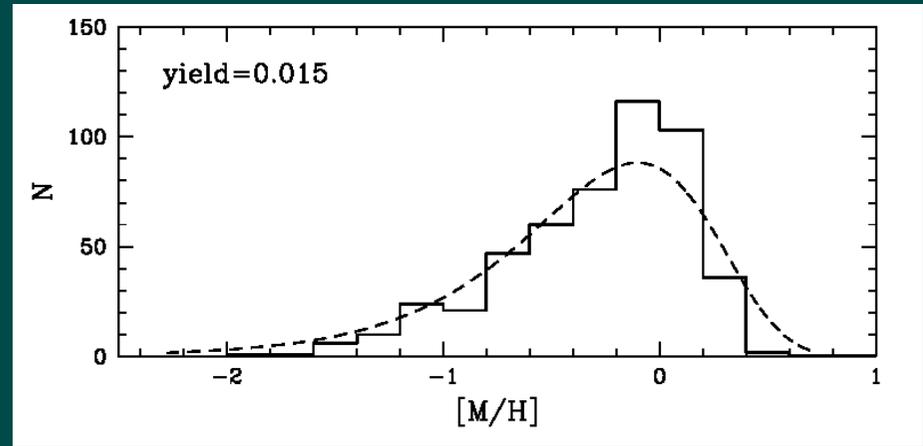
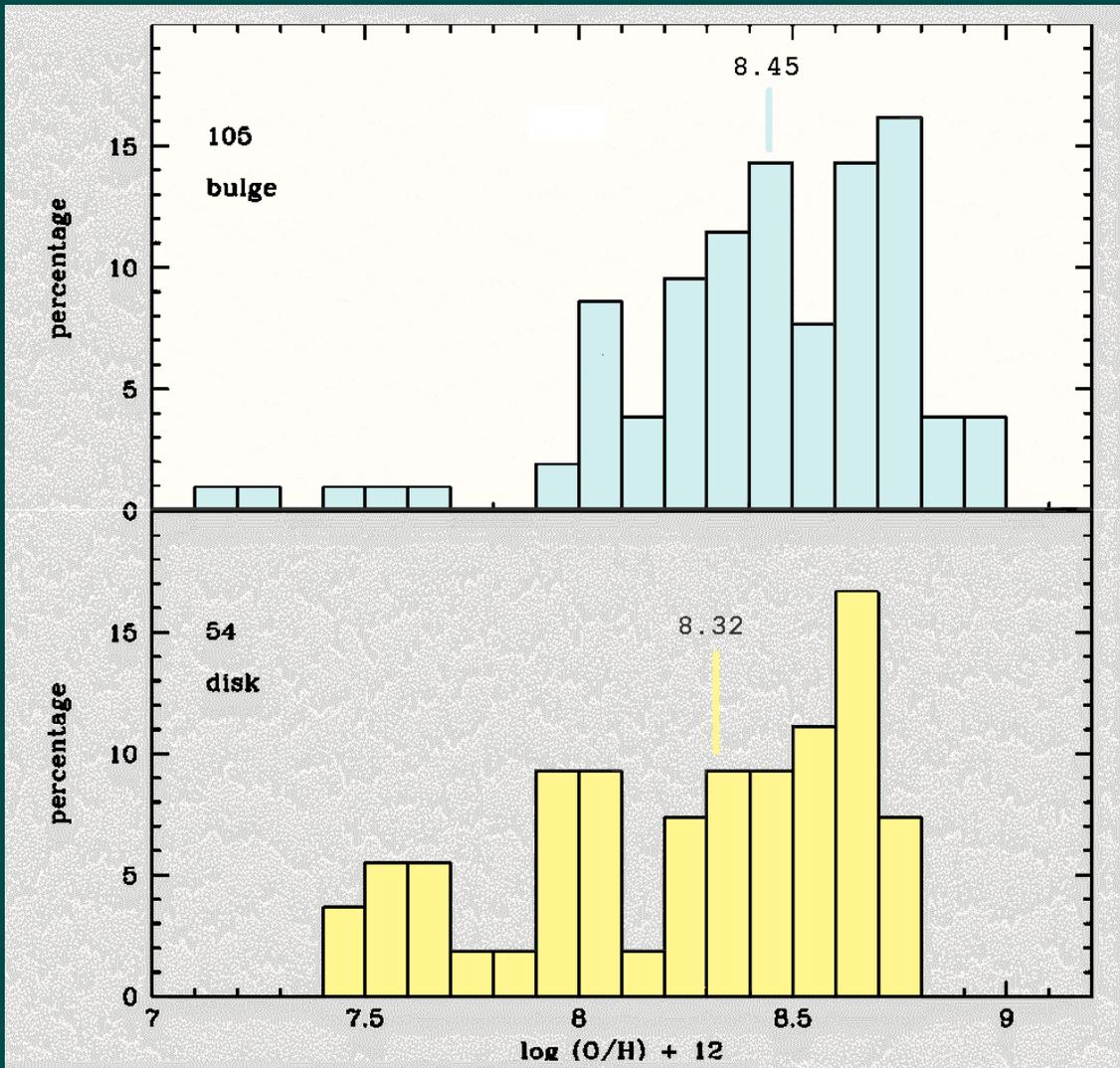
Results



Smartt et al. (2001)

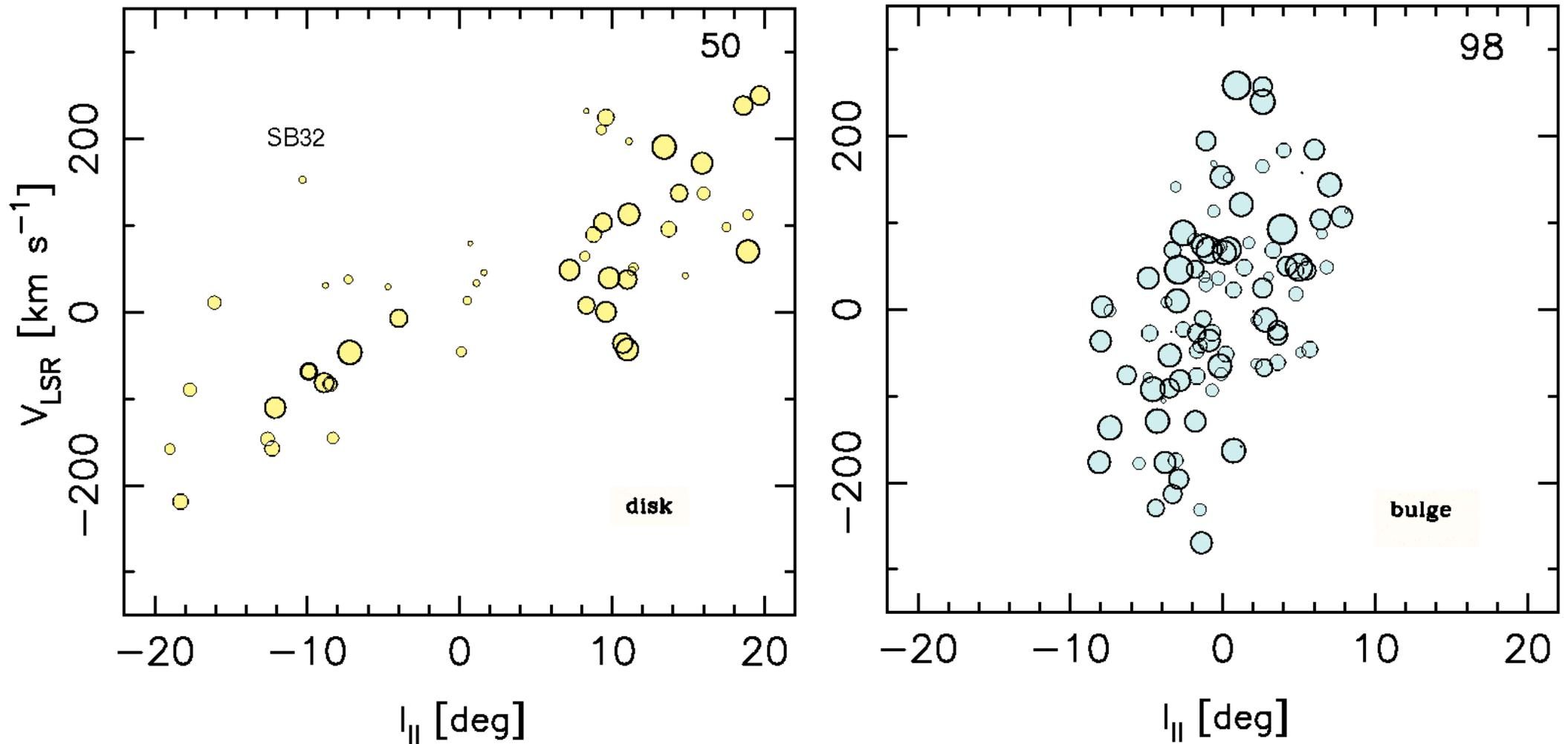


Results



Zoccali et al. (2003)

Results

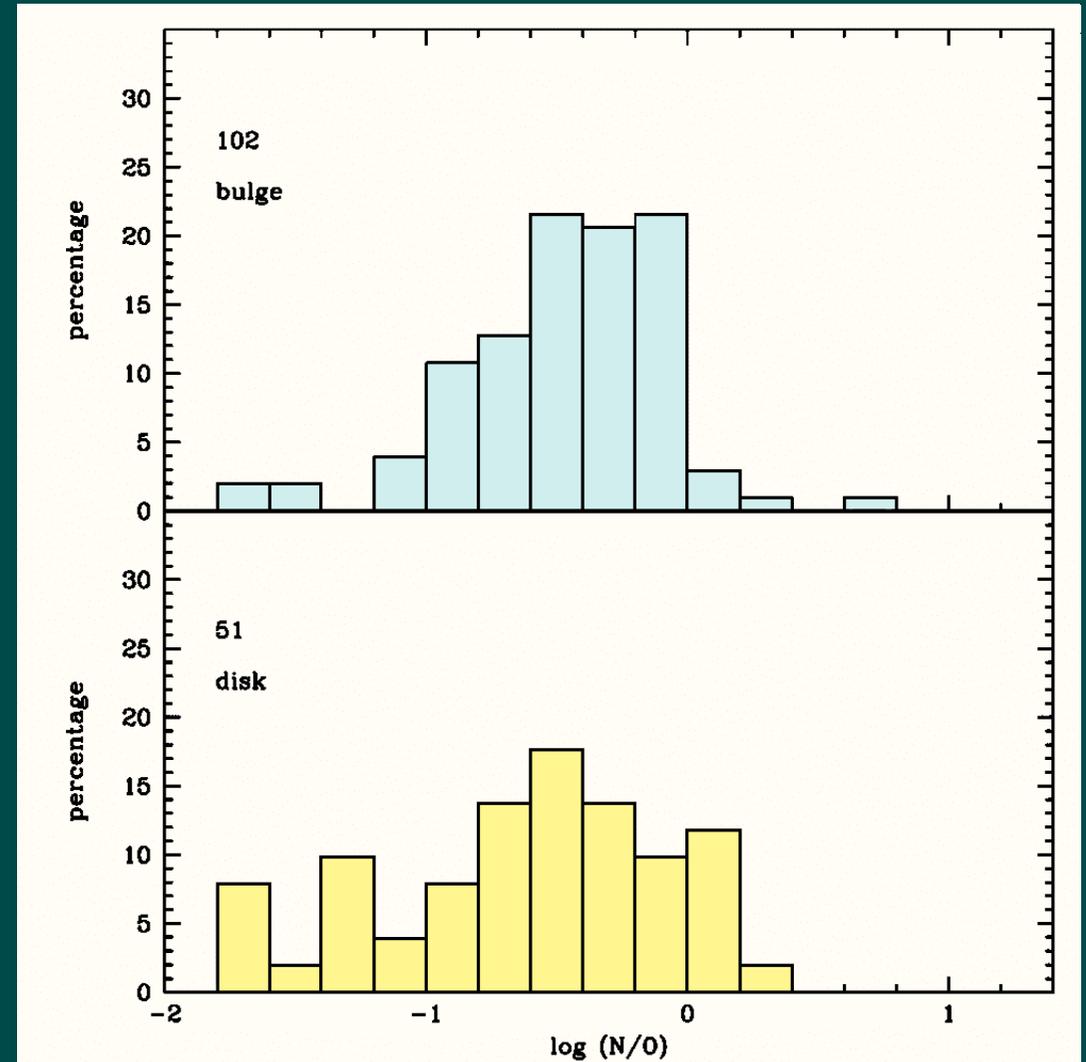


- > bulge and disk subsamples consistent with Galactic rotation
- > Pne with smaller O/H have smaller radial velocities

Results

nitrogen enrichment is a function of the progenitor's mass

-> the distributions statistically indistinguishable



Conclusions

We have determined in a coherent way the composition of 164 planetary nebulae in the direction of the Galactic center. A population most probably pertaining to the Galactic bulge and a population belonging to the disk have been distinguished

- ♦ The O/H gradient of the disk population flattens in the most internal parts of the Galaxy
- ♦ The median oxygen abundance in the bulge is larger than inner disk and the distribution is narrower.
- ♦ The oxygen distribution for bulge PN is similar in shape to metallicity distribution of bulge giants
- ♦ The PNe with smaller O/H tend to have smaller V_{rad}
- ♦ The distributions of N/O are the same in bulge and disk

Conclusions

★ Our work demonstrates that the investigation of PNe is a useful instrument if conducted in a consistent way and based on large, well defined and uniform samples.

... and the plans

★ ...to analyse the different bulge subsamples in more detail: distribution, kinematic properties and abundances (also Ne, S, Ar) and provide constraints on the evolution of the inner parts of the Galaxy.