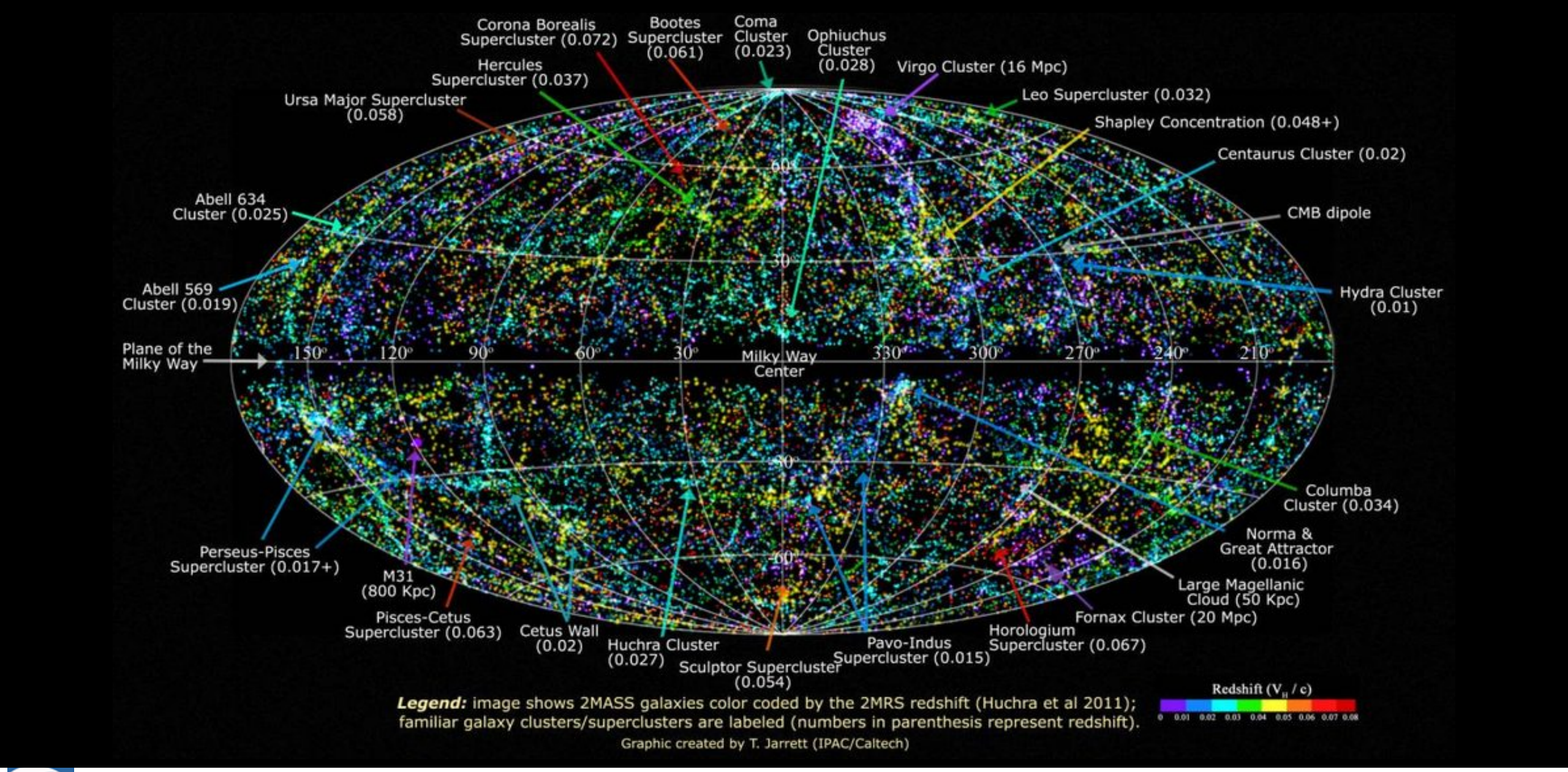
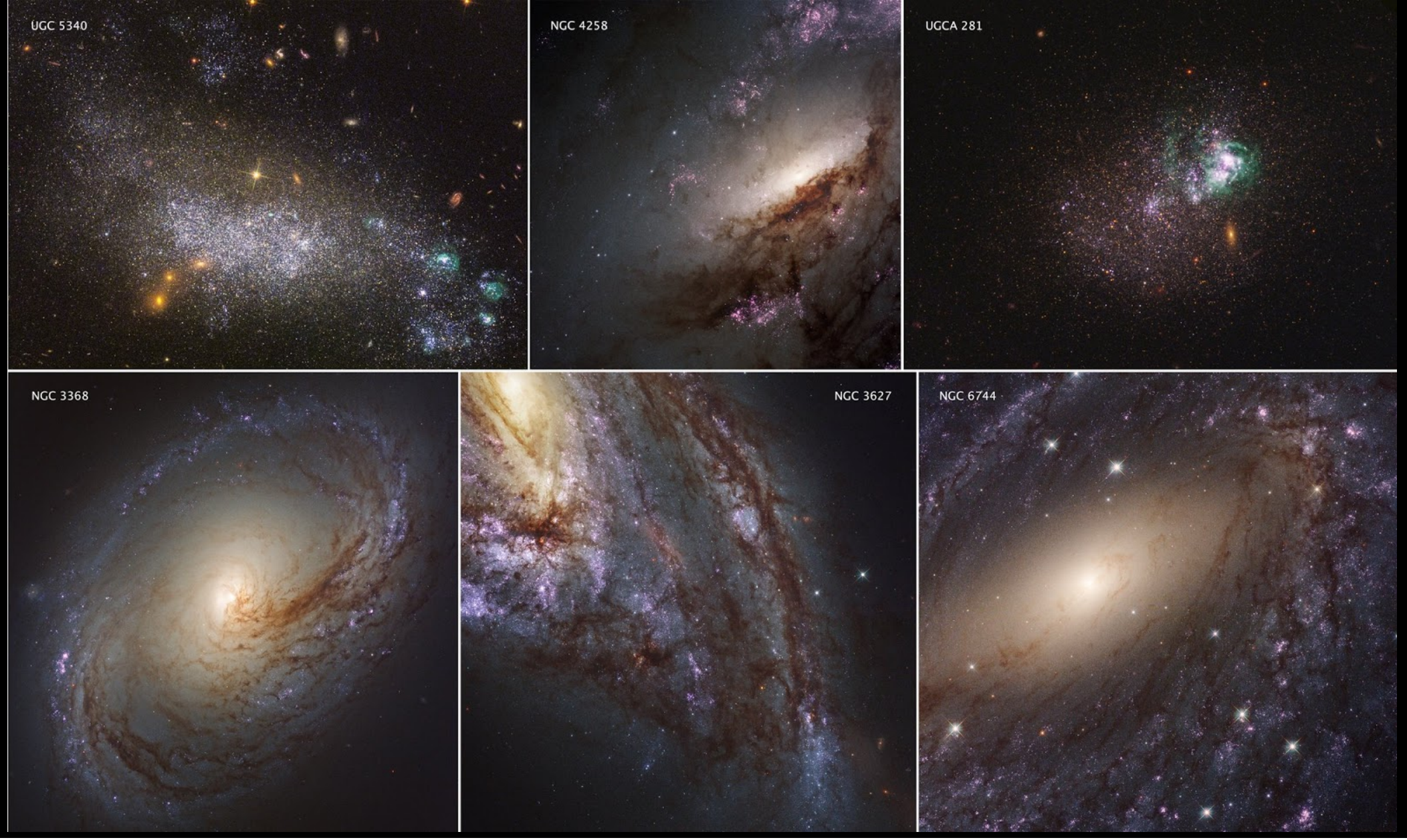


The nearby Universe

Anna Ferré-Mateu

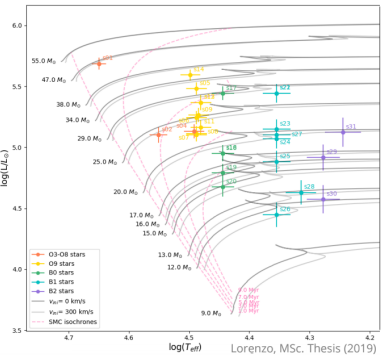

UGC 5340
NGC 4258
UGCA 281
NGC 3368
NGC 3627
NGC 6744

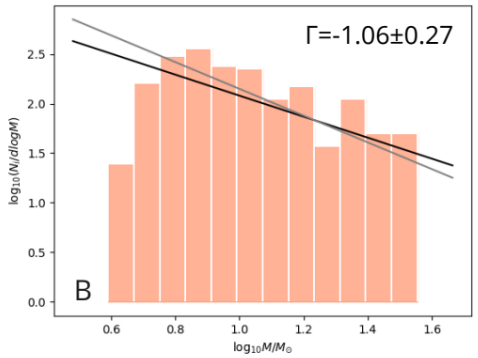
M. Lorenzo: OSIRIS@GTC

metal poor galaxies, large sample OB-stars → regions of intense SF show flatter IMF

(Lorenzo, MSc Thesis 2019)

Our team is working to make Sextans A the new low-Z standard



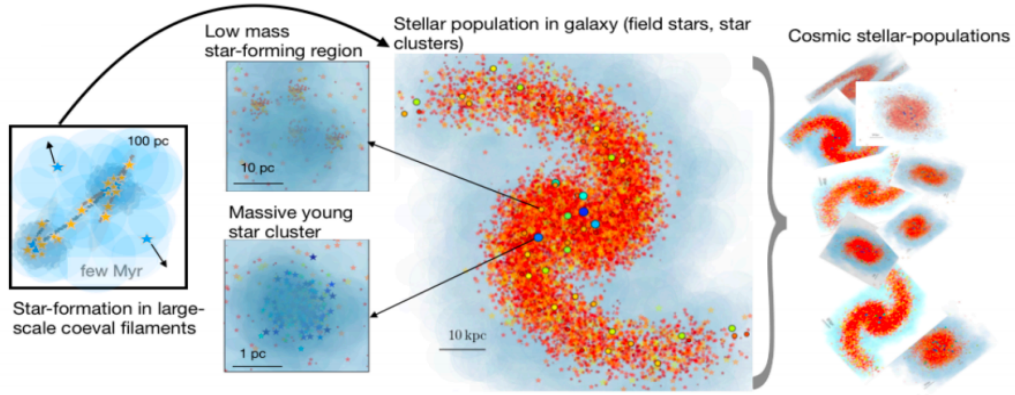


(Yan, Jerabkova+20; Chruslinska, Jerabkova+20)

T. Jerabkova: GAIIMF →

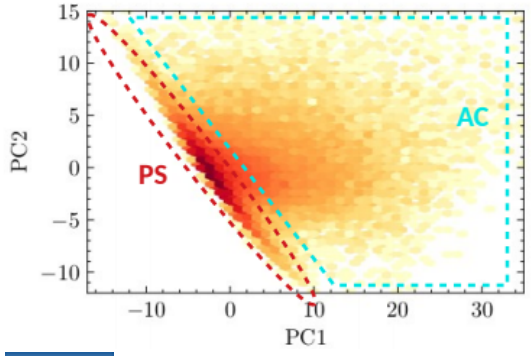
IGIMF connects small-scale SF to galaxy-wide properties.

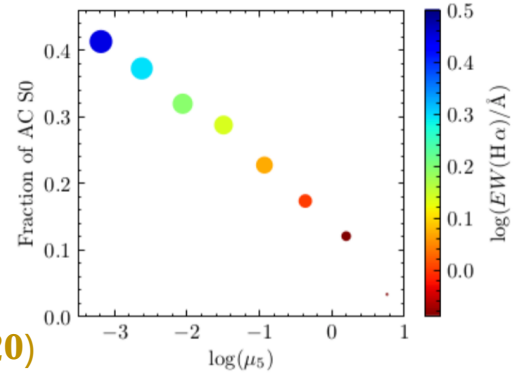
The IGIMF theory uses empirically driven constraints to compute stellar populations in star clusters, galaxies and on cosmic scales.



J.L. Tous: S0 subpopulations → PS (3/4) vs AC(1/4)

AC less massive, more luminous, with less concentrated light profiles, have a younger, bluer, and metal-poorer stellar component, and avoid high-galaxy-density regions





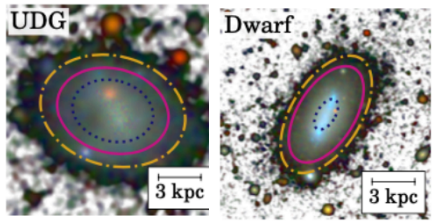
(Tous+20)

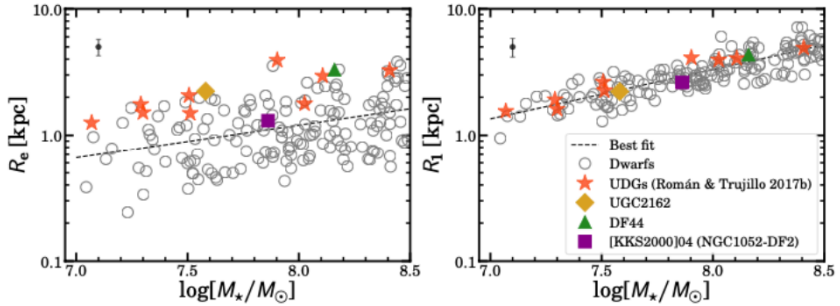
N. Chamba: SDSS Stripe82 survey

new physically motivated size R1 → expected location of the gas density threshold for star formation

UDGs are as small as dwarfs, not like the MW

(Trujillo+20, Chamba+20)



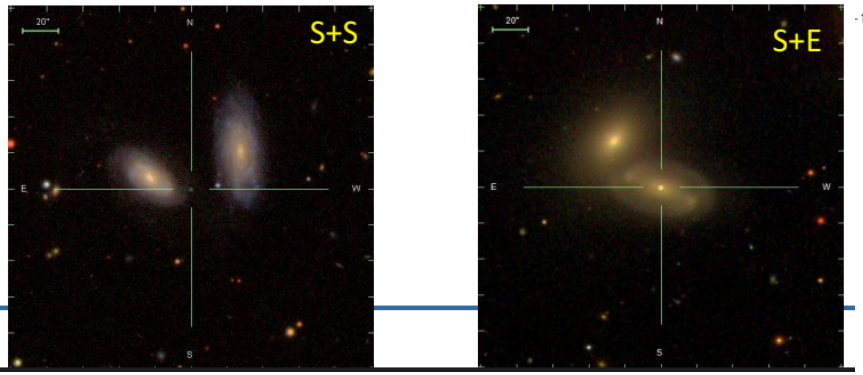


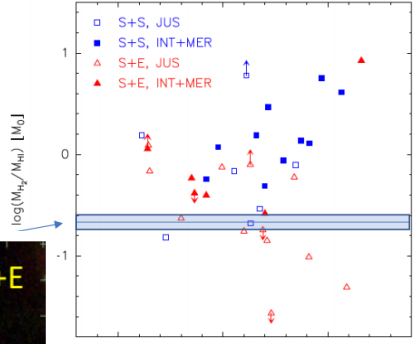
The nearby Universe: IMF, UDGs and Lentinculars

U. Lisenfeld: KPAIR

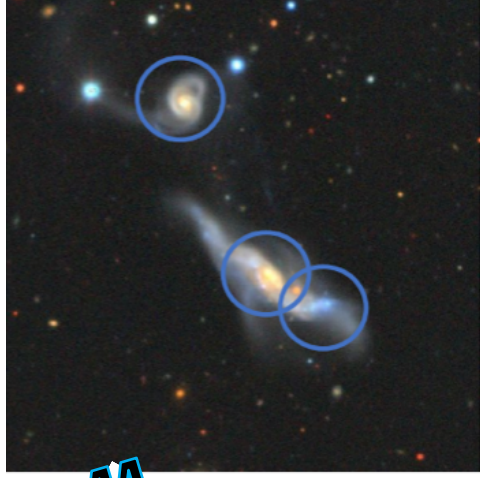
Pairs at different interaction phase

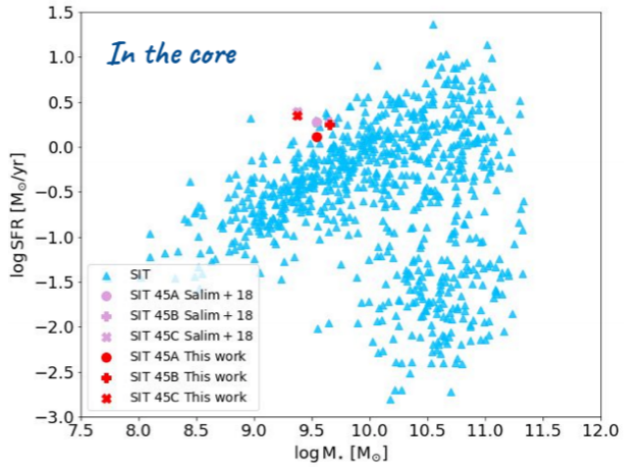
SF enhancement mostly for S+S pairs in first encounter, due to formation of M_{H2} from M_{HI}





(Linsenfeld+19)

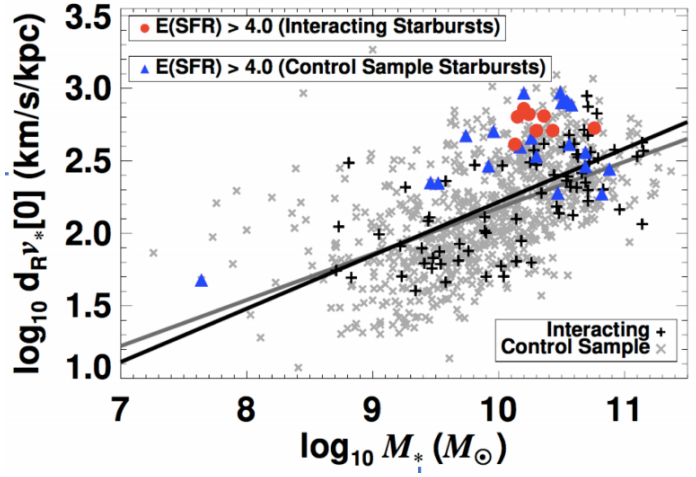




M. Argudo-Fernandez: SIT

SIT45 compact system (starburst galaxies triplet) → SFH shows it is an ongoing merger

(Argudo-Fernandez+15)



S. Diaz-Garcia:

mergers produce x2 enhancement in SF efficiency →

Starbursts have higher central stellar concentrations, low gas depletion timescales, yet similar gas fractions as normal main-sequence galaxies

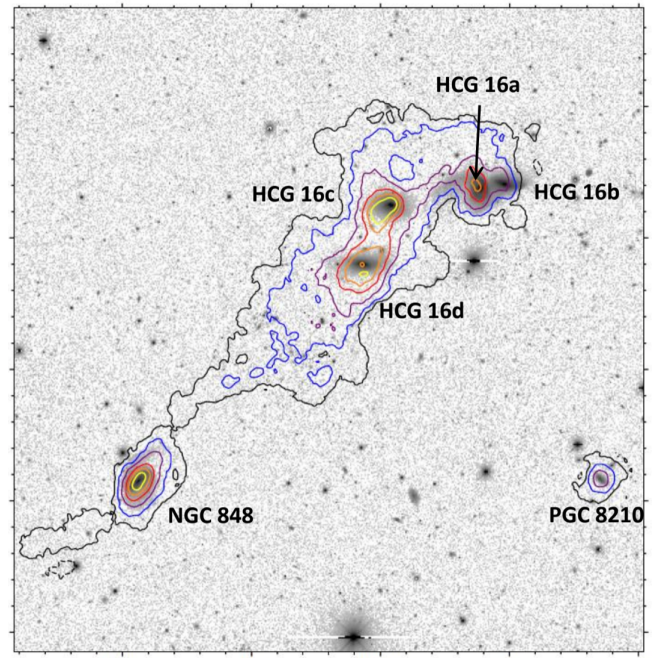
(Diaz-Garcia&Knapen20)

M. Jones: FAIR

Neutral gas study of HCG16 compact group

but using FAIR (**F**indable, **A**ccessible, **I**nteroperable and **R**eusable) workflow for reproducivity

(Jones+19)

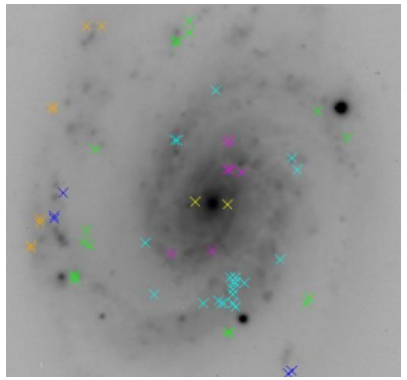


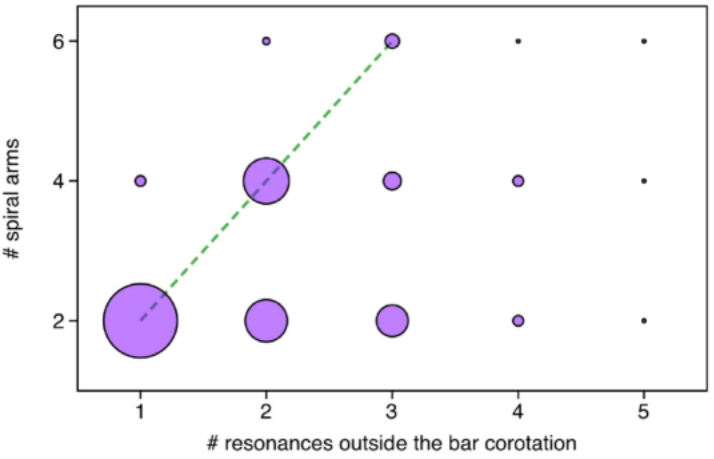
The nearby Universe: Mergers & interactions

J. Beckman: resonance patterns in discs of spiral galaxies is a two-dimensional pattern

the number of the corotation detections increases as the number of arms grow

(Font+19)

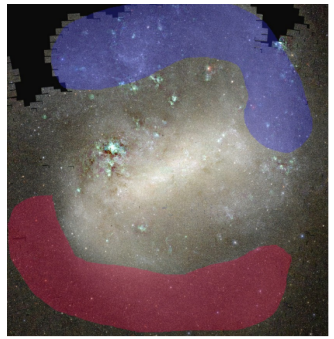


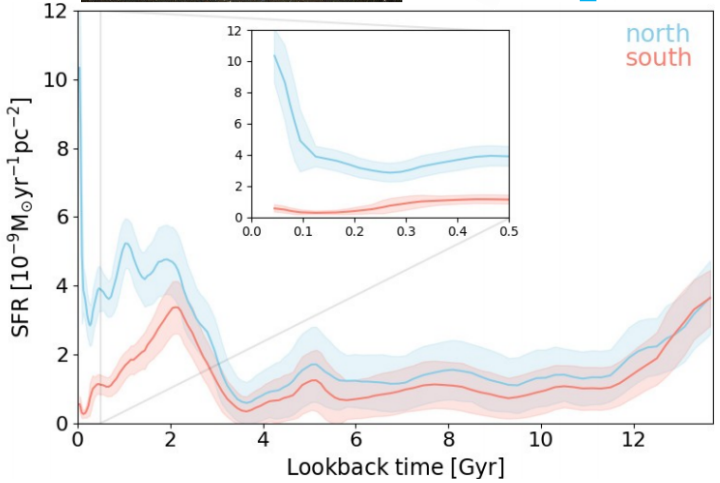


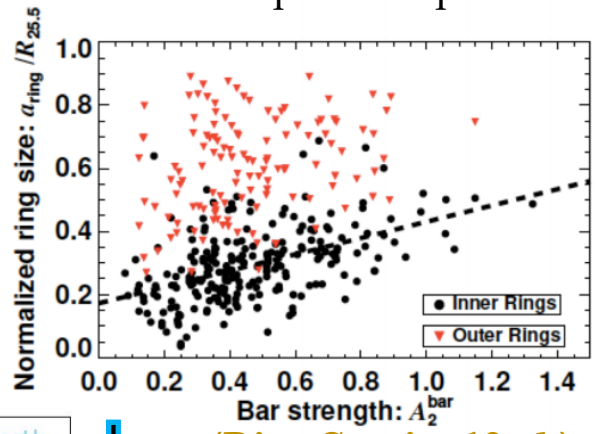
S. Diaz-Garcia: **S4G**

Bar strength correlates inner ring formation, coupling of bar and spiral amplitudes

(Ruiz-Lara+20)



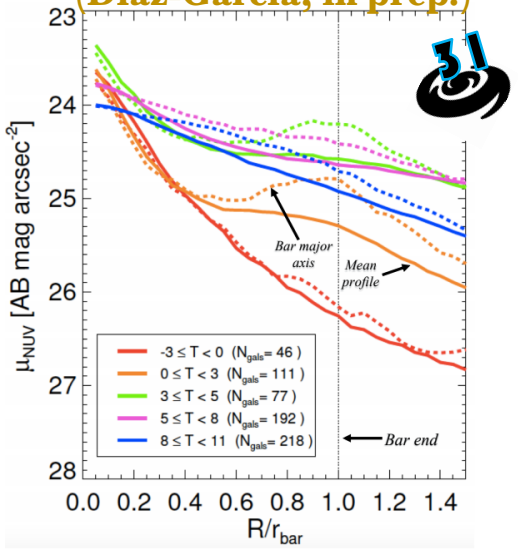




(Diaz-Garcia+19a,b)

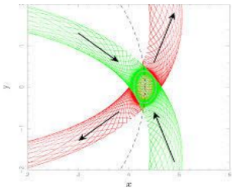
3 modes of distributed ionized gas within bars

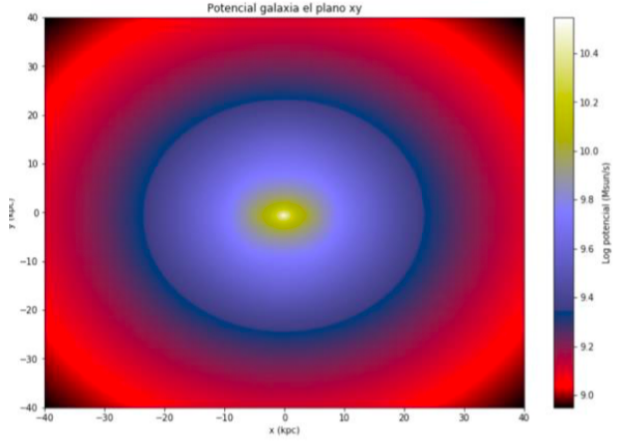
(Diaz-Garcia, in prep.)



V. Padura: **AGAMA**

Testing N-body simulations to see if spiral arms can be triggered by unvariant manifolds





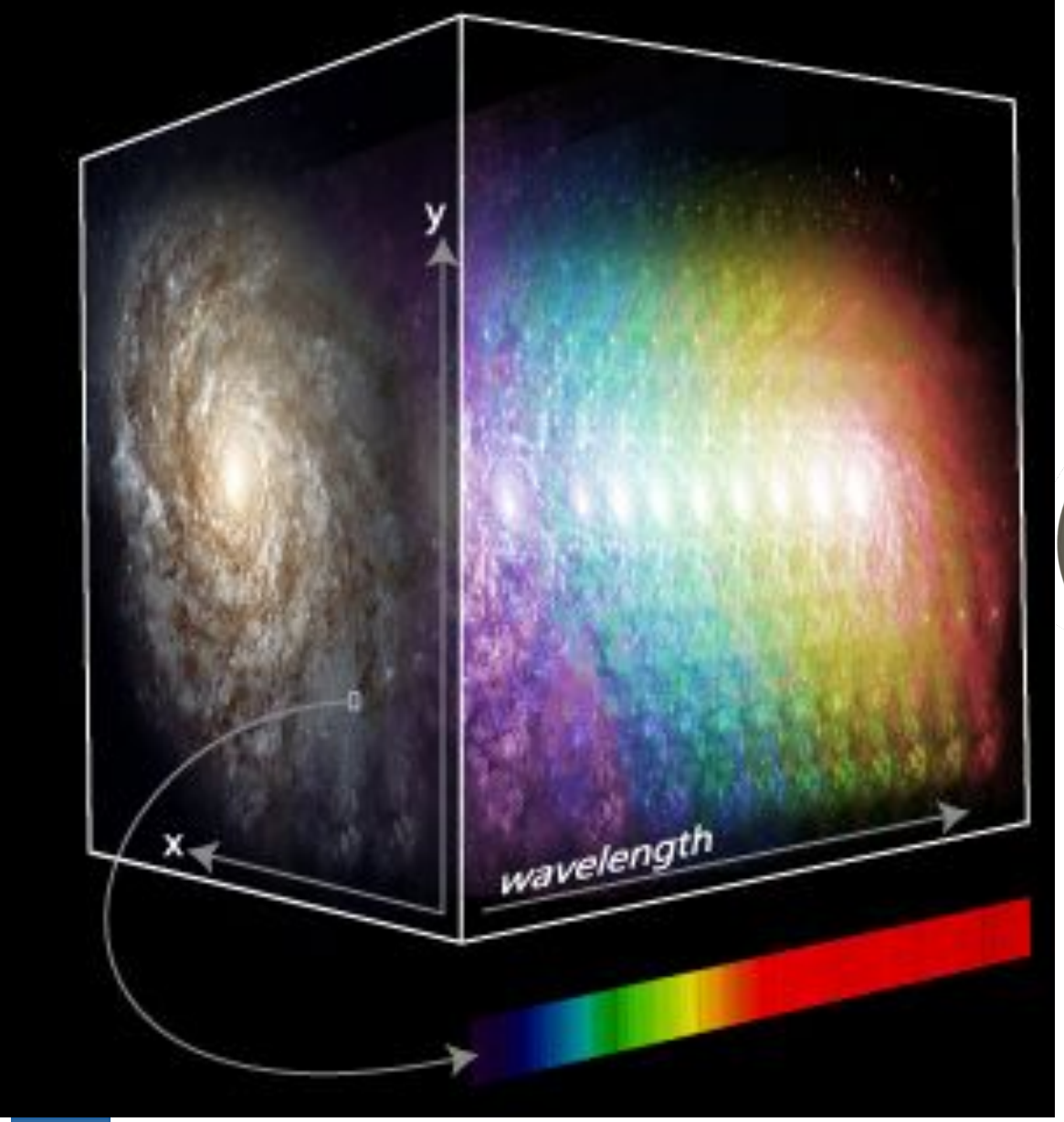
T. Ruiz-Lara:

SMASH 2D photometric catalogues

formation telltale of the LMC spiral arm

clear dichotomy in the young stellar content of the two regions

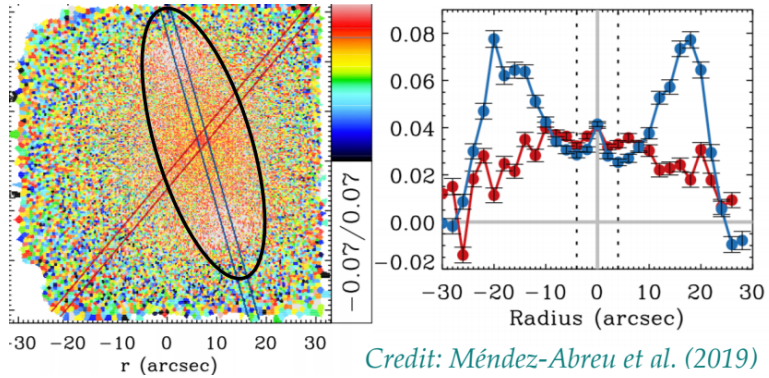
The nearby Universe: Arms & Bars



A. De Lorenzo-Caceres:

first detection of a peanut structure in the inner bar of a double-barred system →

long-lived structures, analogous to regular bars but with smaller size



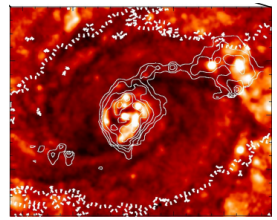
Credit: Méndez-Abreu et al. (2019)

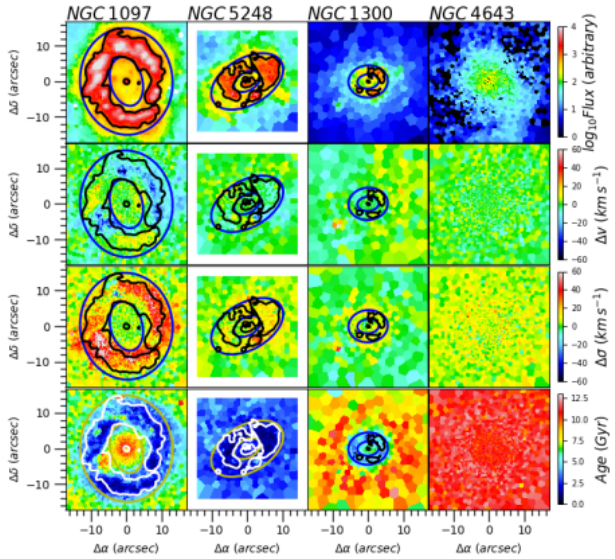
(de Lorenzo-Cáceres+19)

D. Rosado-Belza:

Stellar populations of galaxies with nuclear rings:

Young stellar populations (mostly in nuclear rings) have higher velocities and velocity dispersion than the old stellar population.



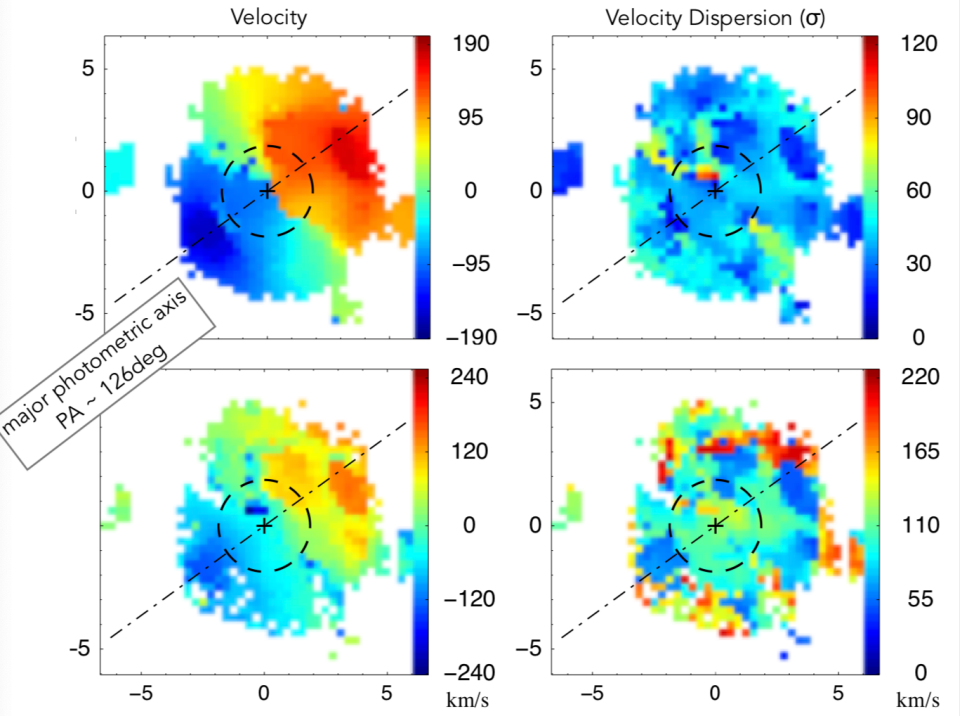


The nearby Universe: IFS studies

S. Cazzoli: MEGARA@GTC

Hα-[NII] emission in NGC7469→

presence of a very thin (20 pc) ionised gas disc supported by rotation, embedded in a thicker (222 pc), dynamically hotter one in NGC7469.

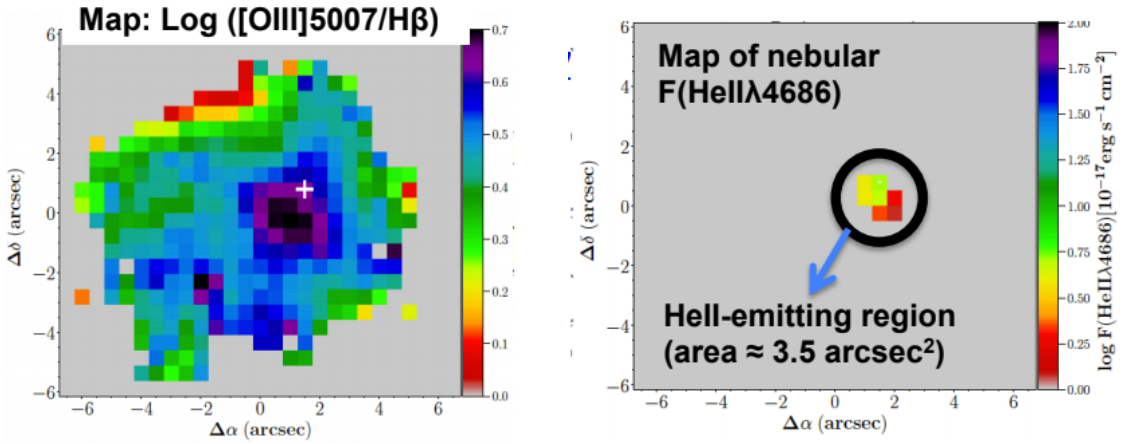


(Cazzoli+20)

Multi Espectrógrafo en GTC de Alta Resolución para Astronomía

C. Kehrig: MEGARA@GTC

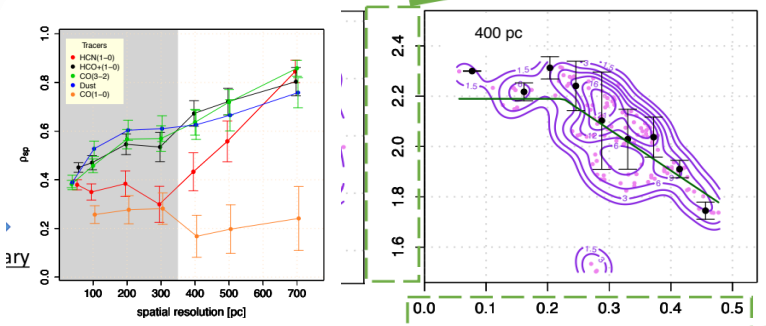
metal poor, high ionzed HII PHL293B → analog of the early Universe (Kehrig+19)

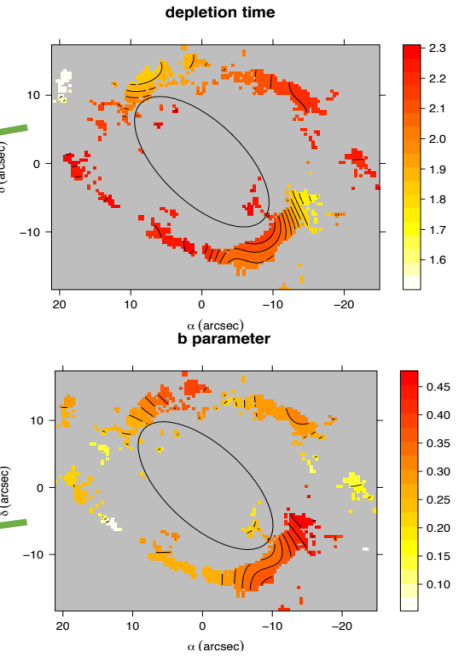


M. Sanchez-Garcia: ALMA+HST

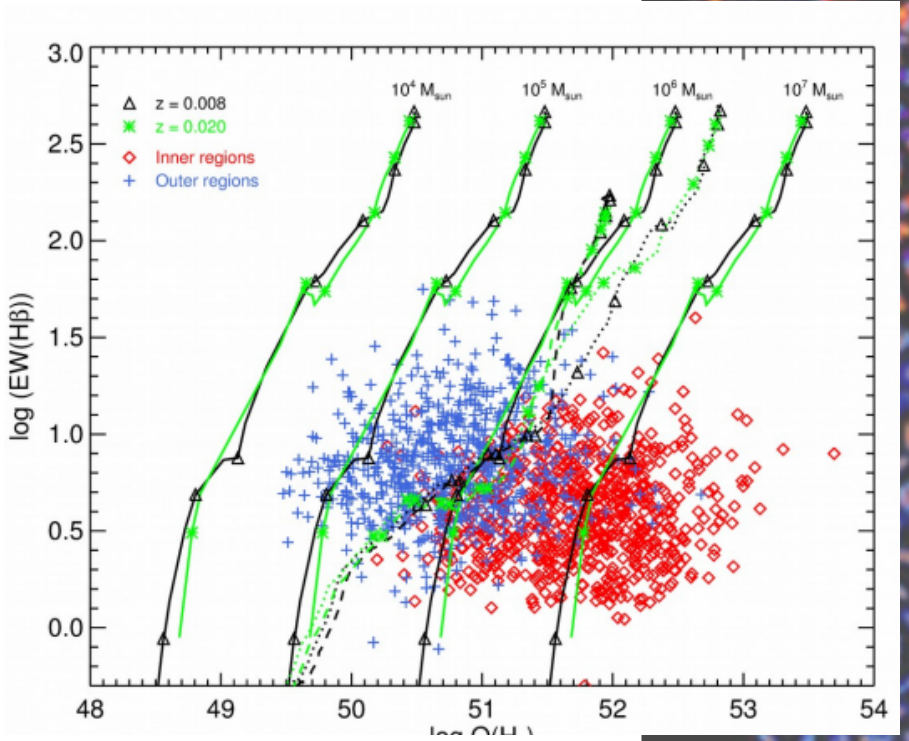
SFR in NGC1068 → critical scale (300-400pc)

Two dynamical environments → galactic dynamics key in deriving SF efficiency



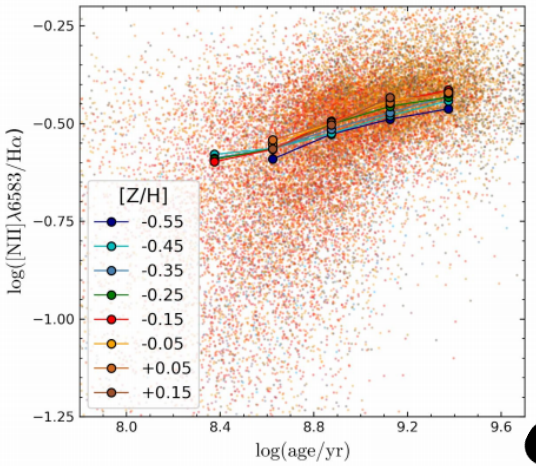


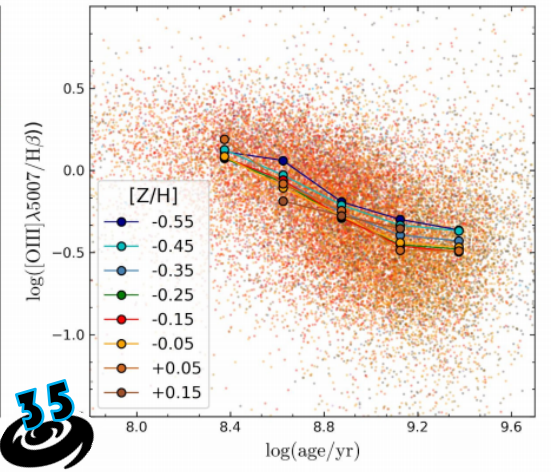
M. Rodriguez-Baras:
inner and outer HII regions show clear differences in metallicity, mass and age:
Inner have higher metallicities, are older higher masses and larger sizes
(Rodriguez-Baras+18,+19)

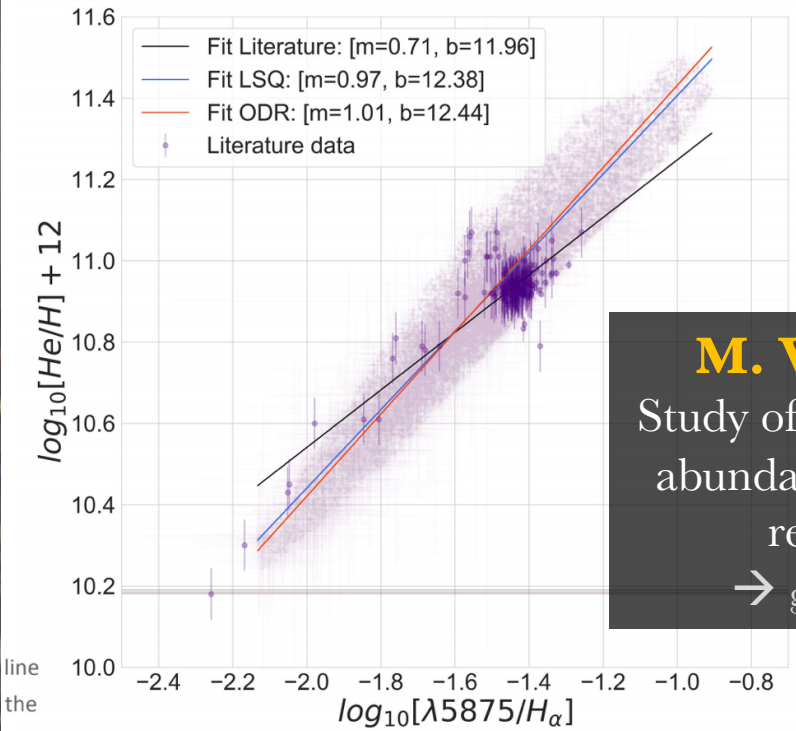


C. Espinosa-Ponce:
largest catalog of HII regions → new diagnostic diagrams

→ clear correlations of line ratios with both the ages and metallicities
(Espinosa-Ponce+20)



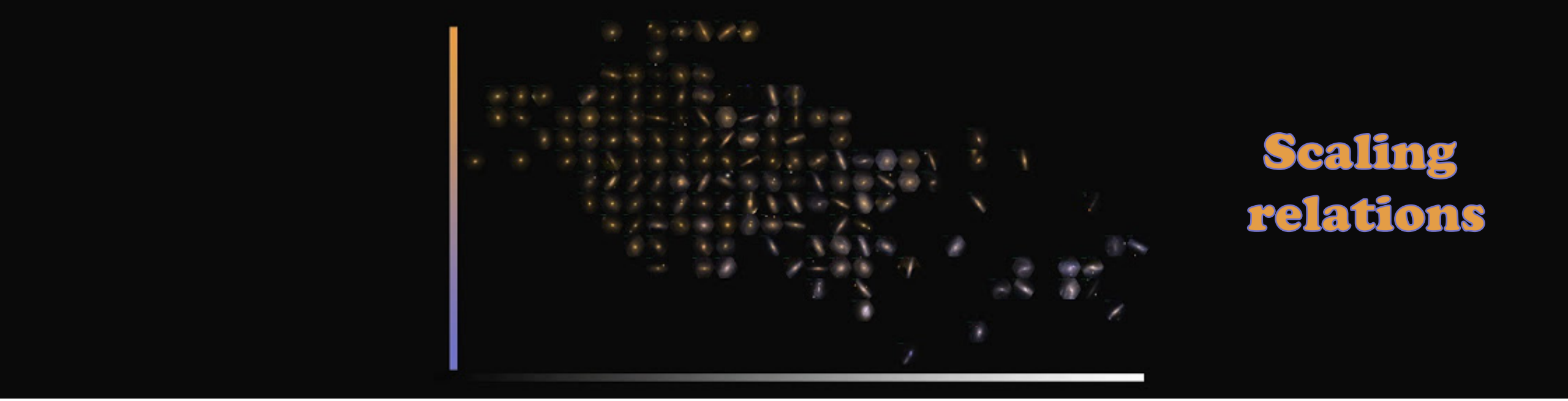




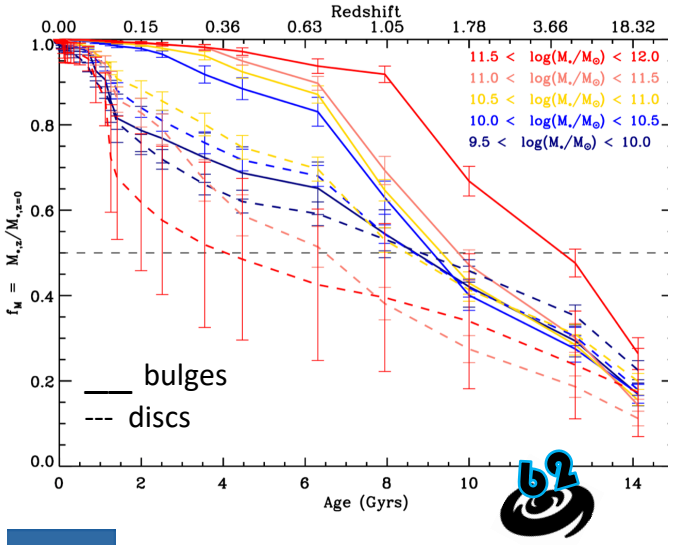
M. Valerdi:
Study of the Helium abundances in HII regions

→ gradients?

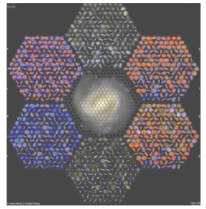
The nearby Universe: IFS studies



Scaling relations



J. Mendez-Abreu: Mass growth



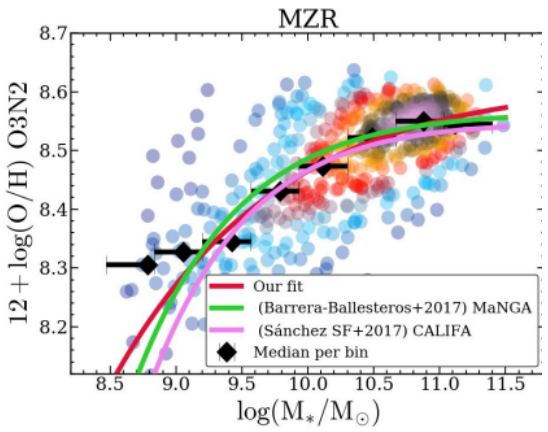
inside-out scenario for non-barred disc galaxies

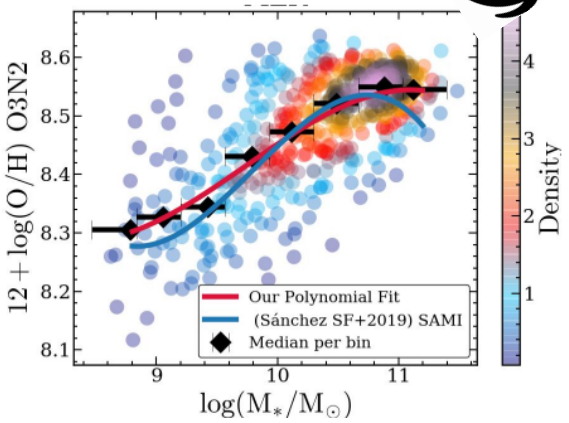
Bulges are older and more metal-rich and form earlier than discs

(Mendez-Abreu+19)

P. Alvarez-Hurtado: MZR

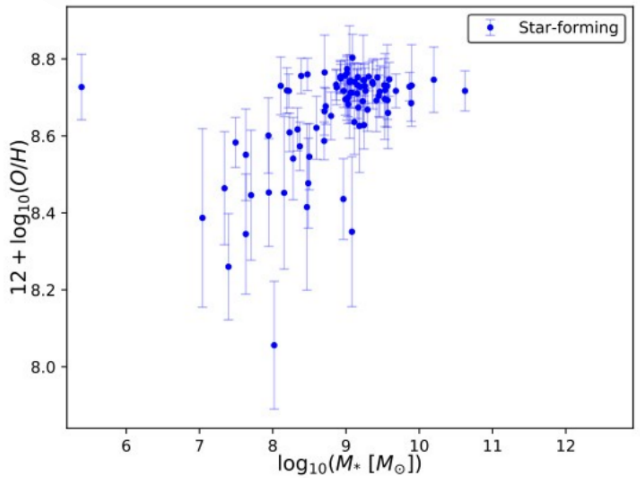
its functional form depends on statistical criteria → Generate non-existing secondary realtions! Careful!

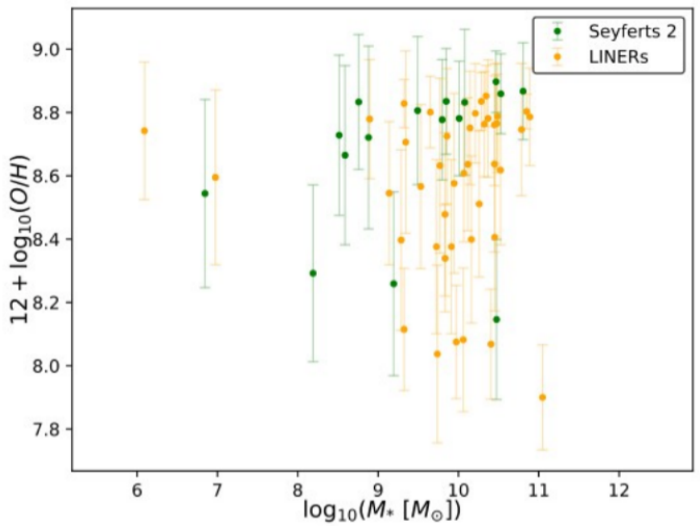


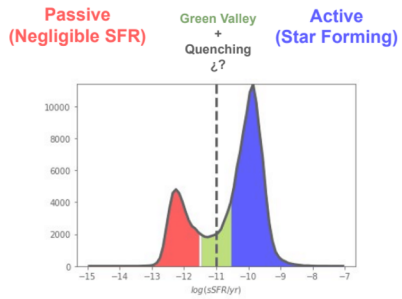


B. Perez: Palomar Spectroscopic Survey

HII-CHI_MISTRY code → Metallicity relation for the nuclear regions of galaxies



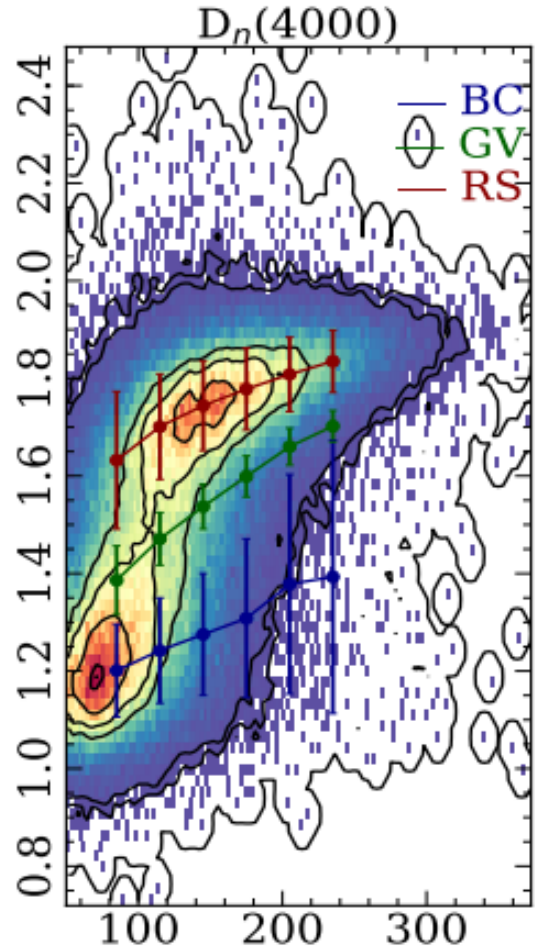




J. Angthopo: SDSS

Green Valley galaxies using D4000 break → dust resilient

Quicker transition from BC to GV and slower from GV to RS

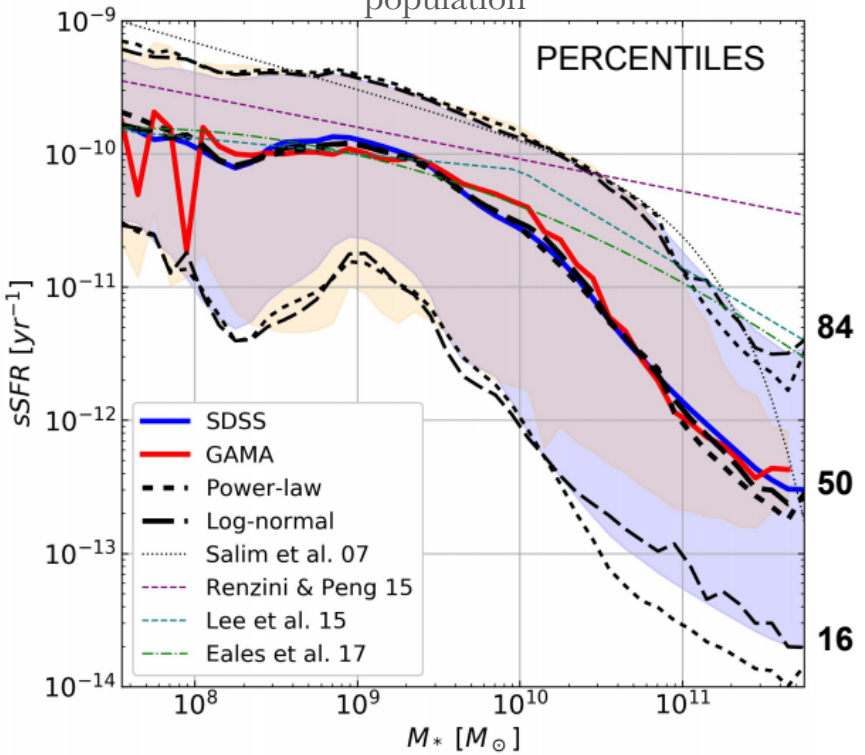


(Angthopo+19,+20)

P. Corcho-Caballero: SDSS+GAMA

No bimodality→

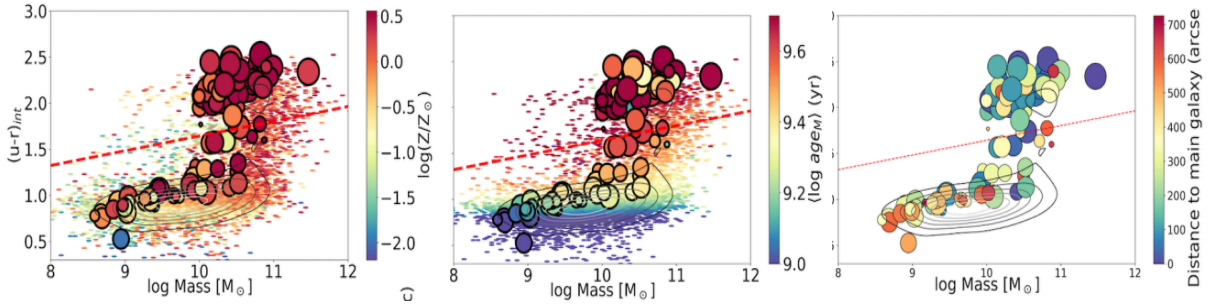
local Universe population has a single probability distribution + shallow power-law tails for the passive population



The nearby Universe: Global Scaling Relations

J.E. Rodriguez-Martin: J-PAS

Cluster 1001 environment study of stellar populations → red galaxies are the closest to the BCG, most of the galaxies high t_{form} but low tau for RS

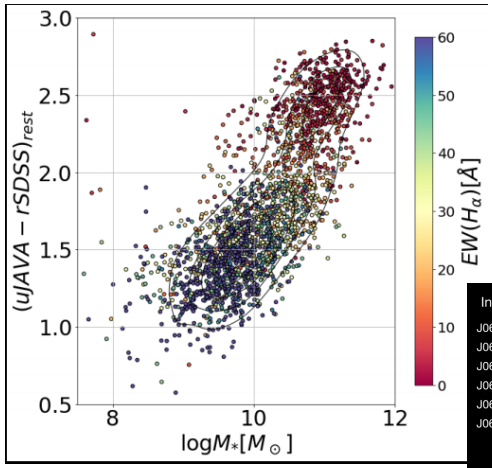


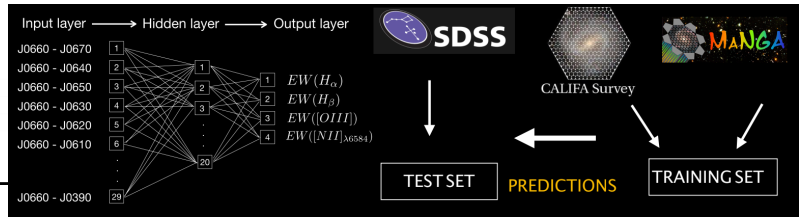
J-PAS
Javalambre Physics of the Accelerating Universe Astrophysical Survey

G. Martinez-Solaeche: J-PAS

New method ANN (Artificial Neural Network) →

Classify galaxies, measure emission lines, BPT diagrams, and study the luminosity function



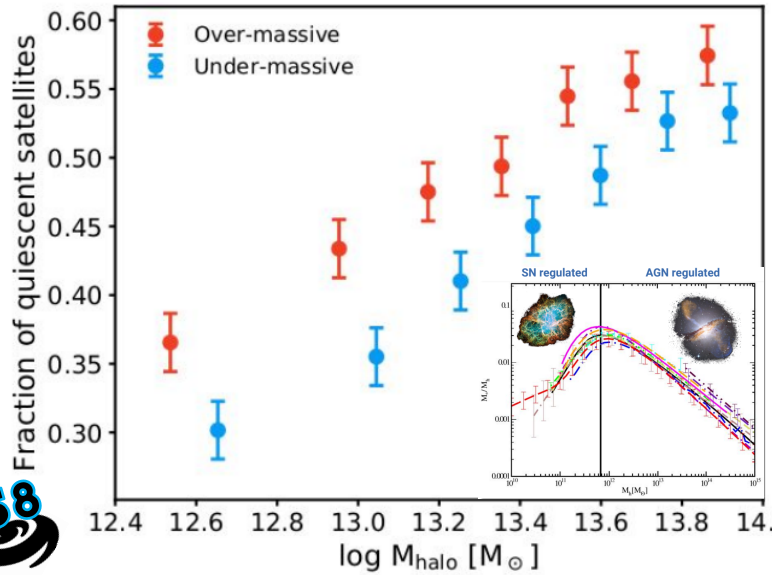


I. Martin-Navarro:

BH feedback rules →

halos hosting more massive black holes have an enhanced population of quiescent satellite galaxies and a hotter intracluster medium

(Martin-Navarro+19)

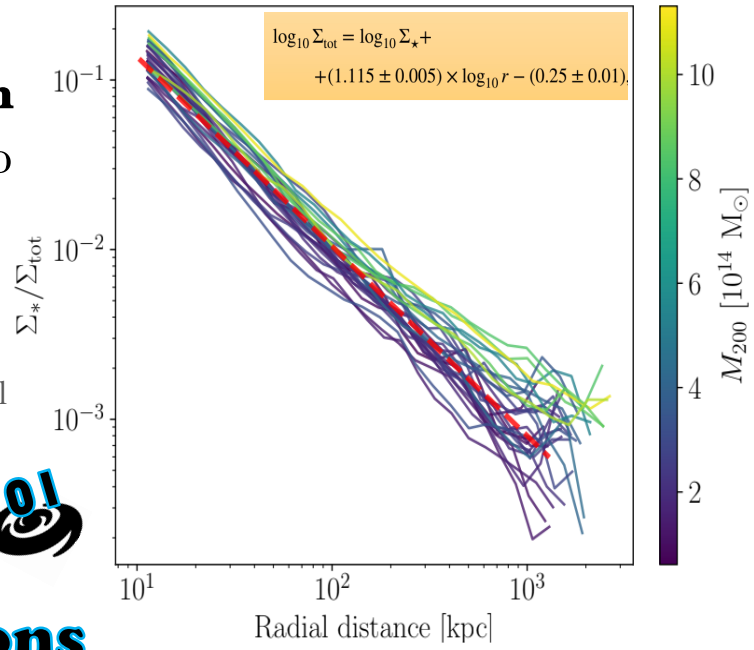


I. Alonso Asensio:

C-EAGLE Simulation

method to calculate halo mass and mass density from the ICL stellar mass density →

shape of the stellar mass distribution follows that of the total matter even more closely than observed, although their radial profiles differ



The nearby Universe: Global Scaling Relations

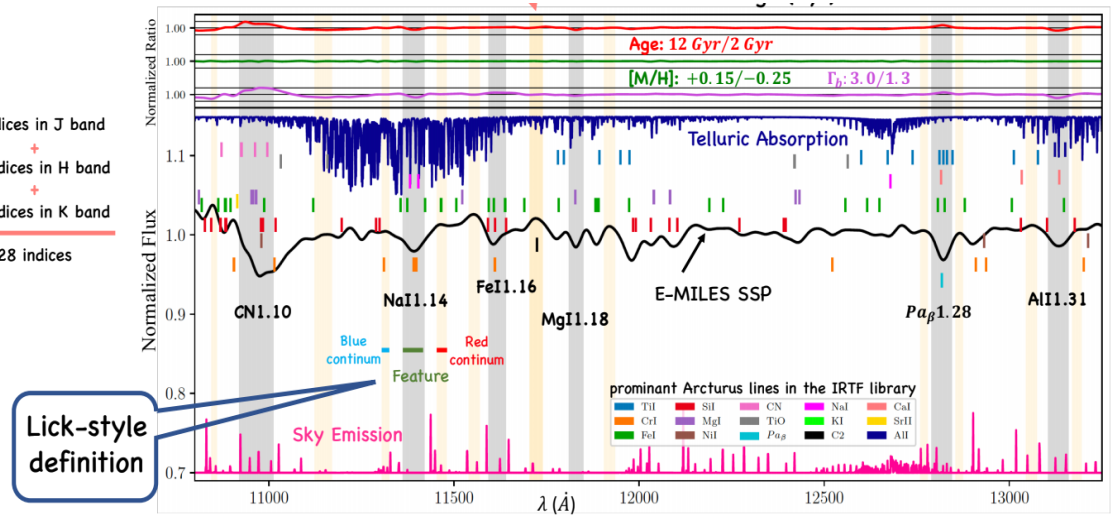
E. Eftekhari: NIR spectral indices

J, H, K bands covered →

galaxy evolution studies in the NIR

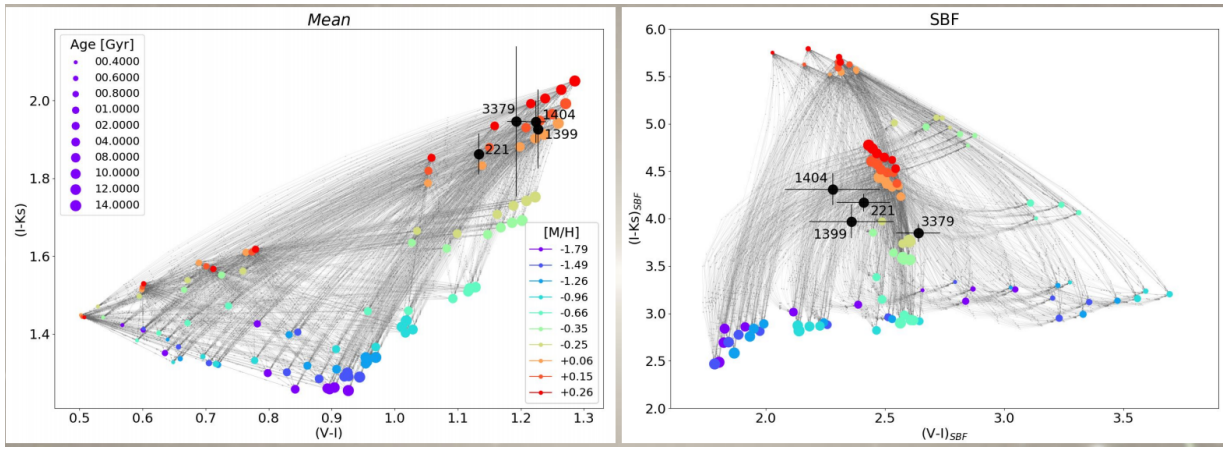
8 indices in J band
+
10 indices in H band
+
10 indices in K band

28 indices

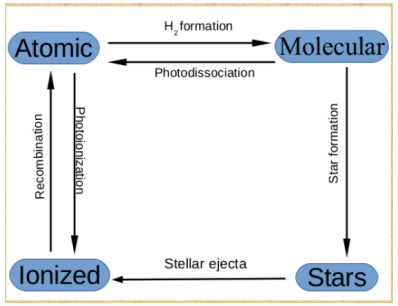


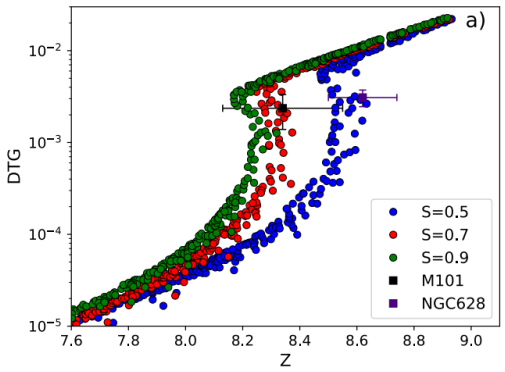
P. Rodriguez Beltran: Surface Brightness Fluctuations

Reveal the metal-poor content in metal-rich ETGs



Muliphase code for galactic chemical evolution: metals and dust



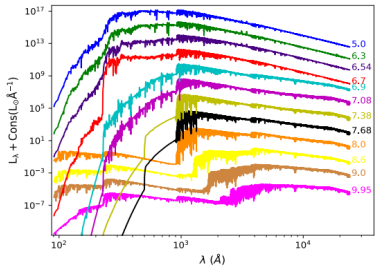


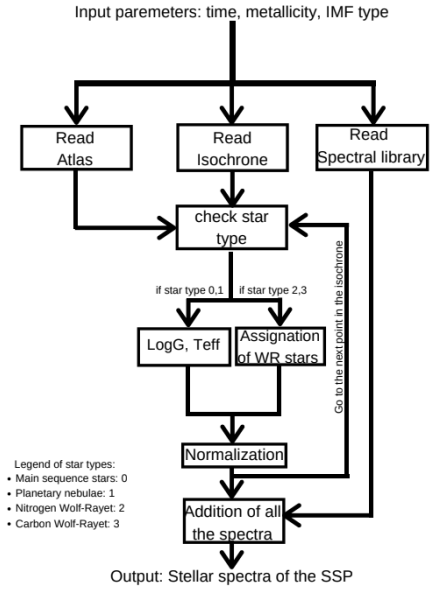
I. Millan Irigoyen:

Models reproduce the DTG-Z relations at high, med Z, but not in the low

HR-pyPopStar

Python-based updated version of PopStar of high resolution SSPs





Let's see what new discoveries lay ahead!

Local Universe is very diverse... and fun!