SEA Virtual Science Meeting 2020

RC3: La Vía Láctea y sus componentes

82 contributions

20’ Summary of main results in the presented contributions

25’ Open discussion on hot topics in the study of the MW and its components

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15:30-16:15h
Tuesday, July 14th 2020

Milky Way's Formation and evolution

(a) VL026 - *Gallart et al.*
Uncovering the birth of the Milky Way through accurate stellar ages with Gaia

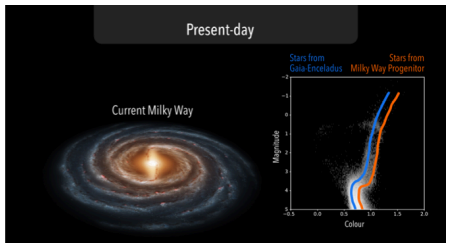
(b) VL058 - *Mor et al.*
Gaia mission data reveals a re-ignition of star formation in the Milky Way's disc about 5 billion years ago

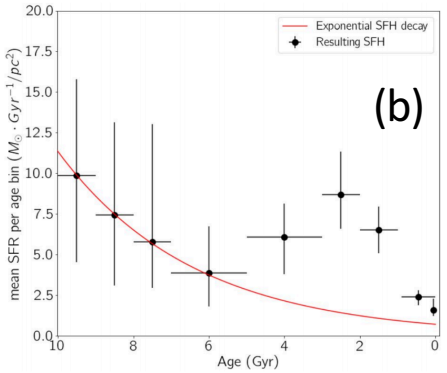
(c) VL069 - *Roca-Fàbrega et al.*
The bimodal A(Li) distribution of Milky Way's thin disk stars and the Galactic scale events

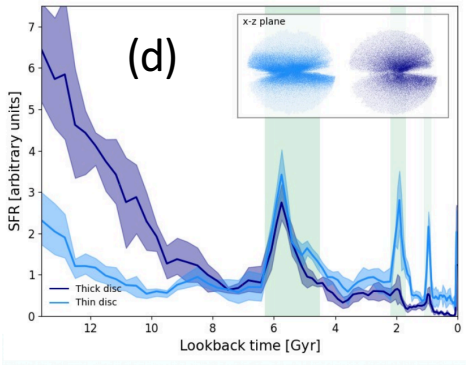
(d) VL074 - *Ruiz-Lara et al.*
The recurrent impact of the Sagittarius dwarf on the Milky Way star formation history

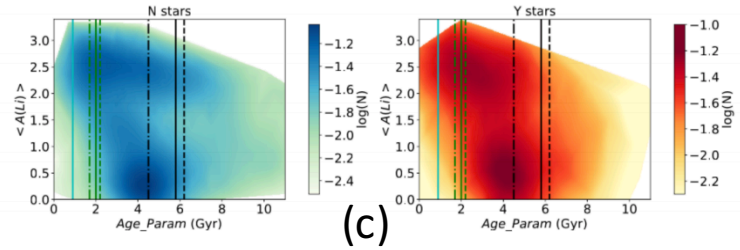
(e) VL078 - *Sotillo-Ramos et al.*
The diverse evolutionary pathways of Milky Way-like galaxies with TNG50

(a)







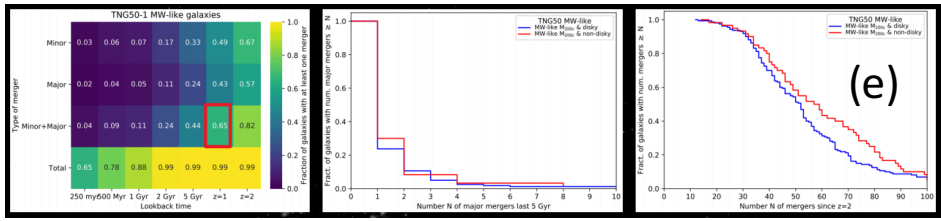


- High quality data from Gaia, combined with chemistry from APOGEE and GALAH surveys, and with theory/simulations, allowed the community to **study the mass accretion history of the MW**.

- Several groups are reporting **new findings on the formation of the thin and thick disks structures**, and also of the stellar halo.

- Events that drove to the formation of the current Galaxy components are **well detected as imprints in the MW's stars chemistry and kinematics**.

- **Cosmological simulations** are playing an important role when trying to understand the effects of Galactic scale events on the MW star formation history.



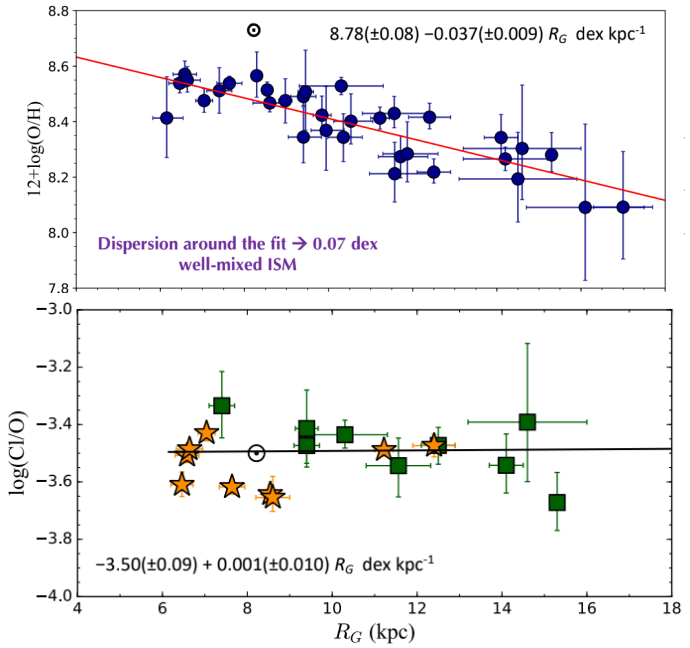
Milky Way's chemistry

(f) VL008 - *Arellano-Córdova et al.*
Understanding the chemical evolution of C, O, N, Ne, S, Cl and Ar in the Milky Way using H II regions

(g) VL013 - *Carbajo-Hijarrubia et al.*
Status of the OCCASO survey for the analysis of the chemistry of the Galactic disc

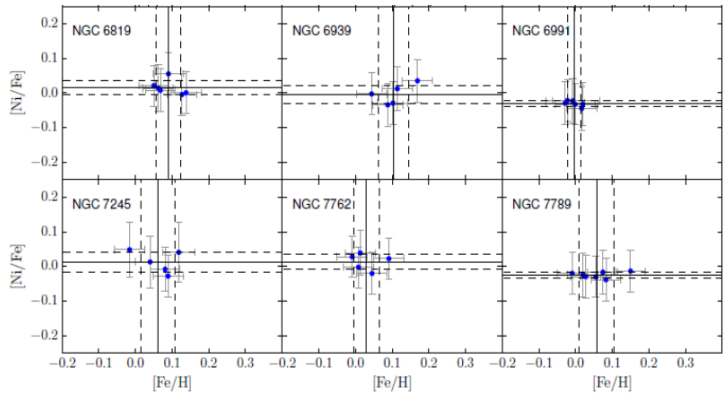
(h) VL082 - *Viscasillas Vázquez*
Chemical abundances of s- and r-process elements in the Solar Vicinity3

(f)



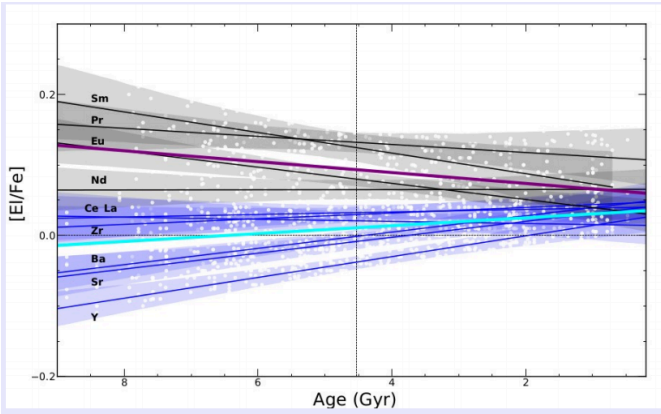
- **Radial profiles and temporal evolution of metal abundances,** both in individual and cluster stars, are being used by many researchers to different scenarios of formation and evolution of the MW components.

- **Comparison with external galaxies** show that the MW behaves similarly to other spiral galaxies.



(g)

(h)



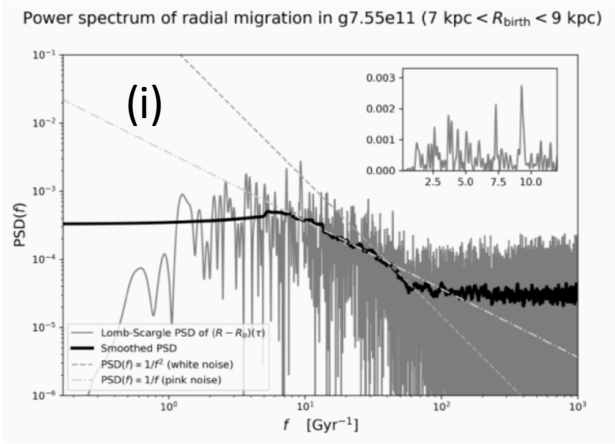
Kinematics of MW stars

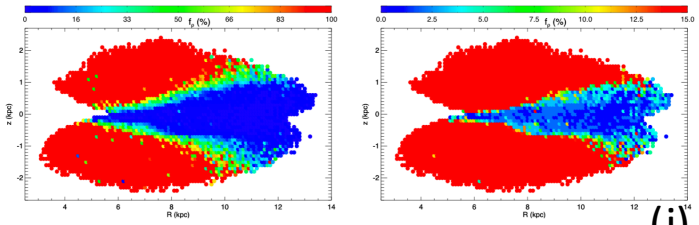
(i) VL004 - *Anders et al.*
Stellar radial migration as a subdiffusive process

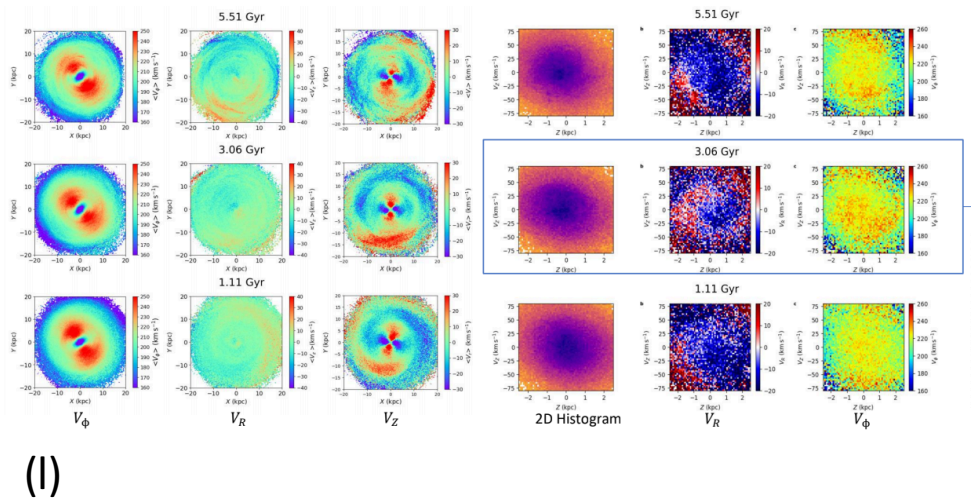
(j) VL005 - *Anguiano*
The Stellar Velocity Distribution Function in the Milky Way Galaxy

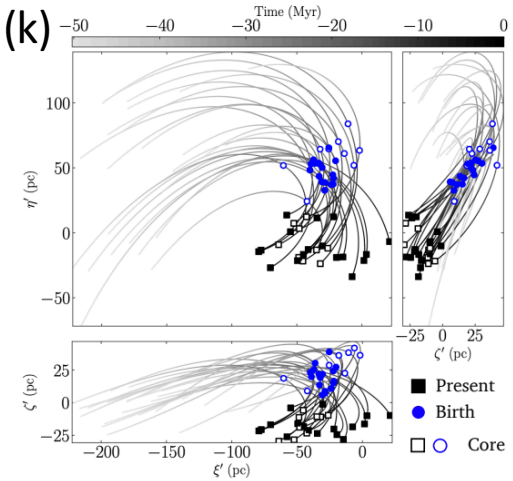
(k) VL018 - *Miret-Roig et al.*
Dynamical traceback age of the Beta Pictoris moving group

(l) VL027 - *García-Conde et al.*
Phase spirals in cosmological simulations









- High precision Gaia DR2 kinematics are used by several groups to get a better modelling of the **thin-thick disk components and its evolution in time** (e.g. radial migration).

- **Cosmological simulations have shown to be good tools** to better understand formation and evolution of **kinematic structures** in the MW thin disk.

Stellar structures - Disk

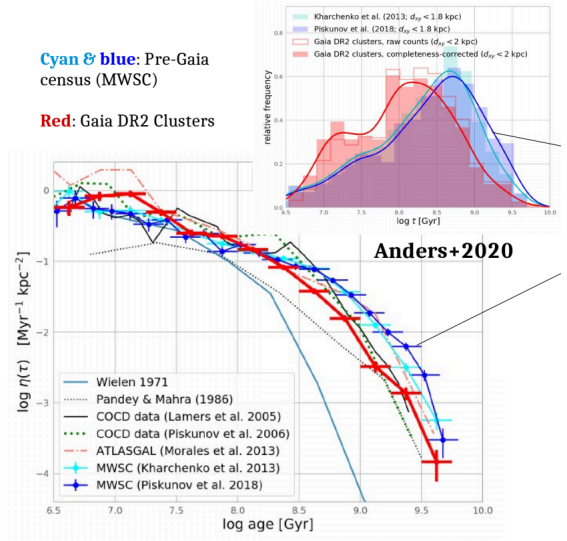
(m) VL016 - *Anders et al.*
Reanalysing the Galactic open-cluster population in light of Gaia DR2

(n) VL017 - *Chrobakova et al.*
Structure of the outer galactic disk with Gaia DR2

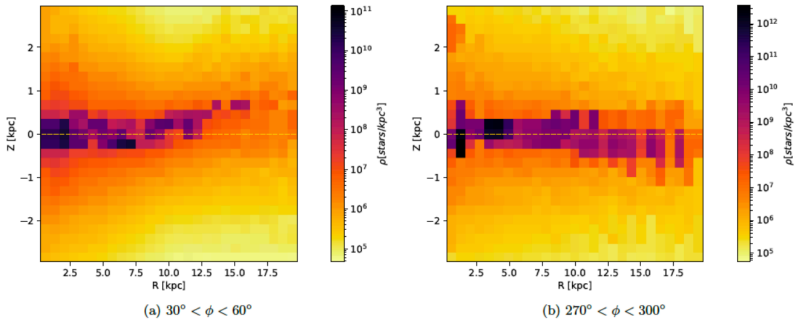
(o) VL062 - *Pardo-Araujo et al.*
Probing the precessing bar model for the Galactic warp origin

(p) VL073 - *Romero-Gómez et al.*
Dissecting the Galactic bar using Gaia observables and statistical techniques

(m)



(n)



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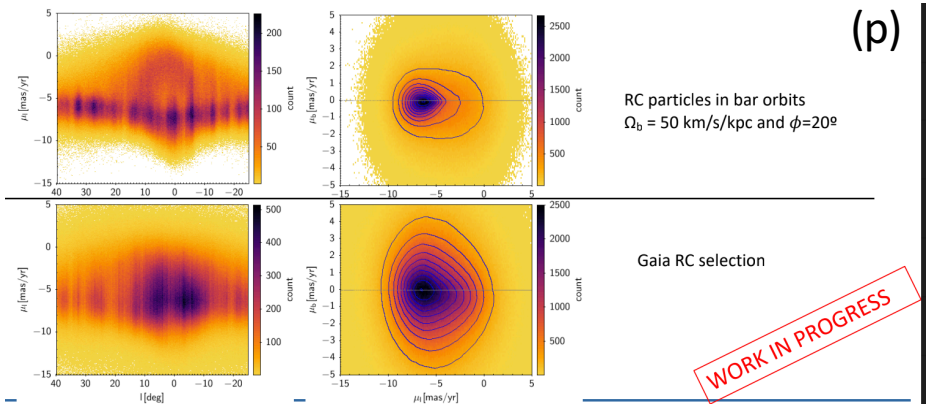
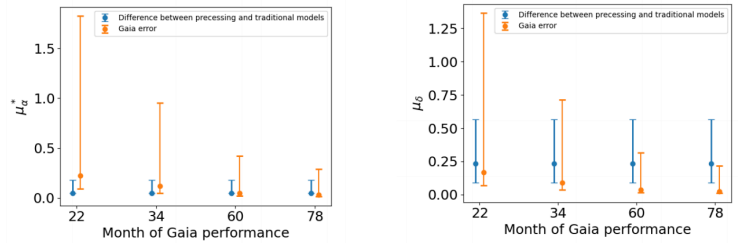


- Several colleagues are analyzing the MW disk. They compared Gaia data with theoretical models to better understand the **formation and nature of the Warp**.
- The **galactic bar** is also deeply analyzed by applying statistical techniques on the Gaia DR2 data.
- A **new OC's catalogue** from Gaia DR2 has been obtained. OC's stellar age function needs to be revised.

(o)



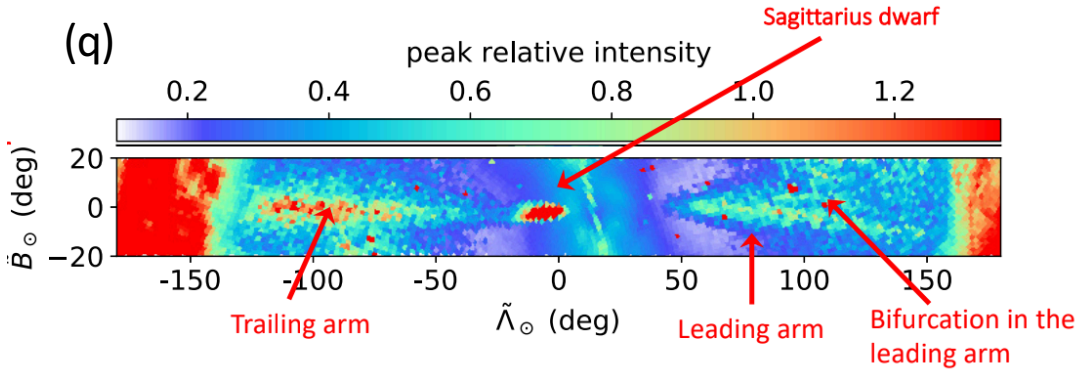
Stellar structures – halo and outer disk

(q) VL006 - *Antoja et al.*
The Sagittarius stream with Gaia data

(r) VL055 - *Miró-Carretero et al.*
Tracing in stellar tidal streams in the Milky Way halo with the J-PLUS photometry

(s) VL066 - *Ramos et al.*
The Halo-Disc dynamical coupling. Gaia blind detection of the Monoceros and ACS structures

(q)



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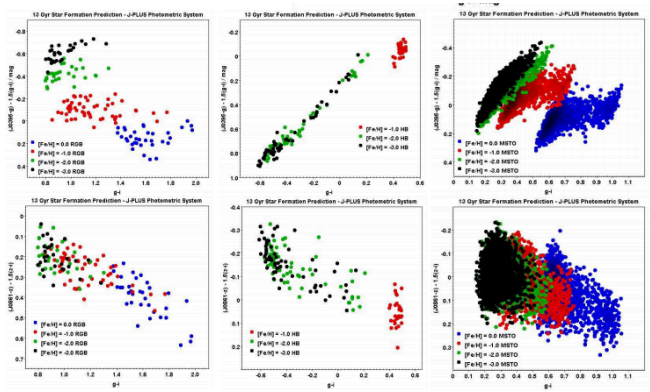

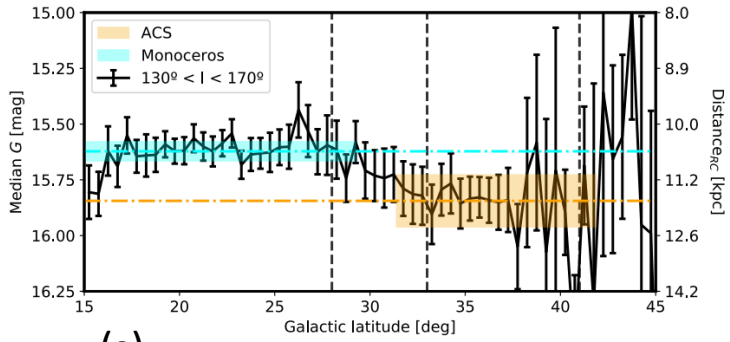

(s)

- Many research groups are working on the analysis of the **halo substructure embedded in GaiaDR2**, using novel techniques. In particular, results from the analysis of the **Sagittarius and its stream** are a clear example of how halo stellar structures give us information on the formation and evolution of our Galaxy.

- Some groups study the presence of new **structures in the outer disk,** that may be a consequence of strong perturbations over the MW's disk.

Some questions / hot topics to be discussed

- MW formation history with Gaia DR3 + RAVE + APOGEE + … will new data be good enough to finally solve some of the still open key/fundamental questions (bar formation and properties, spiral arms, recent perturbers)?

- Is there a flattening of the O/H in the inner disk? What about metallicity gradients in general? Can old/new radial migration scenarios predict/fit new observations?

- The MW's bar: Old, young, long, short, metal rich, metal poor?

- How to break degeneracies on the identification of disk structures caused by external perturbations (streams, warp, stripped stars from the outer MW disk, …)