



MW-Gaia WGAll Workshop

The Milky Way Revealed by Gaia: The Next frontier: MW-Gaia Final Conference

Barcelona (Spain), 5th-7th September 2023

The workshop [The Milky Way Revealed by Gaia: The Next frontier: MW-Gaia Final Conference](#) took place as hybrid in the University of Barcelona, Spain, from 5th to 7th September 2023.

This was the sixteenth workshop of the CA18104 COST Action MW-Gaia and the only one regarding all of the Working Groups. The format of the workshop was based on invited talks (25+5min), contributed talks (15+5 min) and poster presentations (2-3 min)

There was an effort to include as many talks as possible. The selection of participants was based on the relevance of the proposed abstract, the importance of the workshop for the advancement of the career of the applicant as well as diversity (in gender, country, etc). As with all COST actions, early-career scientists were given priority. Researchers who had granted STSMs, VMs and ITCs during the Action were encouraged to present their research resulting from the exchanges.

Scientific motivation of the workshop

This conference aimed to highlight the broad range of results based on Gaia data releases, including outputs from the Action working groups, covering the Milky Way and beyond, stars and stellar clusters, Solar system and exoplanets, Gaia fundamentals, and impact, inclusiveness and outreach. The conference also looked ahead to the next generation of astrometry surveys.

There were five sessions corresponding to the five working groups: a report from each WG, followed by an invited talk and contributed and posters contributions for each WG.

Day One

First day began with a “Welcome to the meeting and Goodbye to the MW Gaia Action” from Nic Walton (Cambridge) and a few logistics words from Carme Jordi (Barcelona and host of the Action).

Sonia Anton (Coimbra) presented the report for WG4: Gaia Fundamentals: Space and Time and the invited was “Close stellar interactions from Gaia) by Nadejda Blagorodnova (Barcelona). Then there were four contributed talks:

- ✓ “Dynamical formation of Gaia BH1 in a young star cluster” by Sara Rastello (Barcelona)

- ✓ “Young Star Clusters Dominate the Production of Detached Black Hole-Star Binaries” by Ugo Niccolò Di Carlo (Trieste)
- ✓ “Unveiling black holes in open clusters” by Stefano Torniamenti (Padova)
- ✓ Natal Kicks on Compact Objects: Insights from Gaia’s Precision Astrometry” by Yue Zhao (Southampton)

And then three poster pitches:

- ✓ “Follow-up studies of Gaia transients with small and medium-sized telescopes: recent results and findings” by Vira Godunova (Kyiv)
- ✓ “Potential of Gaia BP/RP spectra and LDS sky surveys for study of high z Universe” by Rene Hudec (Ondrejov)
- ✓ Characterisation of Gaia alerts using the Virtual Observatory” (online) by Enrique Solano (Madrid)

Then the session dedicated to the WG2: The Life and Death of Stars, began with the report (online) by Gisella Clementini (Bologna), and the invited talk “Gaia RVS spectroscopy: do you really know it?” by Alejandra Recio-Blanco (Nice). Then we had six contributed talks

- ✓ “Young, (metal-)rich ad not alone: formation of thin-disc RR Lyrae stars through binary evolution” by Giuliano Iorio
- ✓ “A Multi-wavelength Study of the Galactic Point Sources in the MeerKAT Galactic Plane Survey with GAIA DR3” by Okwudili Daniel Egbo
- ✓ “The problem of variability of chemically peculiar Am stars” by Natalia Positek
- ✓ “The white dwarf population revealed by Gaia” by Santiago Torres Gil (Barcelona)
- ✓ “Kinematic study of the Orion Complex in the GAIA era” by Sergio Sánchez-Sanjuán
- ✓ “Fine structure in the Sigma Orionis cluster revealed by Gaia DR3” by Marusa Zerjal

And then ten poster pitches:

- ✓ “Analysis and Classification of Hot Subdwarfs Using Artificial Intelligence Techniques and Gaia DR3 data (online) by Carlos Viscasillas Vázquez (Vilnius)
- ✓ “Symbiotic stars in Gaia DR3” (online) by Jaroslav Merc (Prague)
- ✓ “Exploring chemical tagging limitations and feasibility with Gaia-ESO Survey“ by Helio Perottoni (Warsaw)
- ✓ “Spectral Classification of Gaia White Dwarfs within 500 pc using a Random Forest Algorithm” by Enrique Miguel García Zamora (Barcelona)
- ✓ “Population synthesis study of the Gaia single and binary white dwarf population within 100 pc” by Alejandro Santos García (Barcelona)
- ✓ “White dwarfs with infrared excess: Gaia and the Virtual Observatory” by Raquel Murillo-Ojeda (Madrid)
- ✓ “The Gaia color-magnitude diagram revealing the physics of white dwarfs” by Maria Camisassa (Barcelona)
- ✓ “Reactive collisions of electrons with molecular cations of astrophysical interest: effects to H₂⁺, HD⁺, H₃⁺” by Nicolina Pop (Bucharest)
- ✓ “Peculiar radial velocities and action values of red supergiant stars in RSGC4” by Sang-Hyun Chun (Daejeon)
- ✓ “New O and Be runaways stars found with Gaia DR3” by Mar Carretero-Castrillo (Barcelona)

To finish the day, we had the report of “WG5: Impact, Inclusiveness and Outreach” by Elsa Moreira (Porto) and the invited talk “The billion ways of using Gaia data” by Tineke Roegiers (Leiden). And a very inspirational contributed talk:

- ✓ “Impact, Inclusiveness and Outreach: Outputs from the MW-Gaia WG5 School” by Dionysios Gakis (Patras)

Day Two

The second day dedicated to Open Clusters inside WG2 began with five contribution talks:

- ✓ “The bright future of open clusters” by Antonella Vallenari (Padova)
- ✓ “Detection of open cluster rotation fields from Gaia DR3 proper motions” by André Moitinho (Lisboa)
- ✓ “Mass loss in open clusters” by Duarte Almeida (Lisboa)
- ✓ The new detection of blue straggler stars in 50 open clusters using Gaia DR3” by ChuanYan Li (Shanghai)
- ✓ “Evolution of the Vertical Distribution of Open Clusters in the Milky Way” by Sandro Moreira

And six poster pitches:

- ✓ “On the determination of stellar mass and binary fraction of open clusters within 500 pc” by Yueyue Jiang (Shanghai)
- ✓ “Taking the census of star clusters in the Milky Way” by Ariana Dias (Lisboa)
- ✓ “Calibrating APs of Gaia DR3 with Open Clusters” by Tong Tang (Shanghai)
- ✓ “Hunting for Neighboring Open Clusters with Gaia DR3: 101 New Open Clusters within 500 pc” by Songmei Qin (Shanghai)
- ✓ “Building the largest sample of open cluster masses with Gaia DR3” by Andrija Zupic (Barcelona)
- ✓ “Metallicity determination in open star clusters by exploring Gaia--J-PLUS synergy” (online) by Eduardo Machado Pereira (Rio de Janeiro)

After the coffee break the report on WG3: Planetary Systems Near and Far was presented (online) by Joris de Ridder (Leuven) and the invited talk “Gaia DR3 and colors of the Solar System” by Dagmara Oszkiewicz (Poznan), followed by four contributed talks:

- ✓ “Estimating the Shapes and Spins of Asteroids from GAIA DR3 Photometry” (online) by Eric MacLennan (Helsinki)
- ✓ “The Photocenter-Barycenter Effect in Gaia astrometry and its Impact on Asteroid Orbit Determination” (online) by Karolina Dziadura (Poznan)
- ✓ “Shape modelling and spectral classification of asteroids using data from the AS Vidojevica and Gaia DR3” by Gordana Apostolovska (Skopje)
- ✓ “Gaia mission: the true time saver for asteroids shape modelling and spectral classification” by Elena Vchkova Bebekovska (Skopje)

After lunch, Despina Hatzidimitriou (Athens) presented the report on “WG1: The Milky Way as a Galaxy”, followed by the invited talk “Chemodynamical models of the Milky Way” by Eugene Vasiliev (Cambridge). Then there were nine contributed talks:

- ✓ “Possible confirmation of the spiral density-wave structure in the solar neighborhood using about 650000 Gaia EDR3 stars” by Evgeny Griv (Be’er Sheva)
- ✓ “Spiral-like features in the disc revealed by Gaia DR3 radial actions” by Pedro Alonso Palicio (Nice)
- ✓ “Radial Wave in the Galactic Disk: New Clues to discriminate different Perturbations” by Chengye Cao (Shanghai)
- ✓ “Modeling the evolution of the Milky Way from Gaia DR3” by Annie Robin (Besançon)
- ✓ “Improving Galactic Disk simulations with Gaia” by Alessandro Mazzi (Padova)
- ✓ “GASTRO library: studying substructures of the Milky Way stellar halo with SPH + N-body single merger models” by João Antônio Silveira do Amarante (Barcelona)
- ✓ “Studying Jeans Equations in the Milky Way disk” by Orlin Koop (Groningen)
- ✓ “Gaia DR3 determination of the Galactic bar pattern speed” by Merce Romero-Gomez (Barcelona)
- ✓ “Unveiling the structure and kinematics of the Milky Way disk with A stars” by Judith Ardèvol (Barcelona)

And three poster pitches:

- ✓ “Measuring the Milky Way Potential with the Phase Snail in a Model Independent Way” by Rui Guo (Shanghai)
- ✓ “The star formation history of the Galactic disk from Gaia DR3 and the BGM FAST Galaxy model” by Marc del Alcázar i Julià (Barcelona)
- ✓ “Precise stellar ages for Galactic archaeology through machine learning” by Friedrich Anders (Barcelona)

Day Three

The third day we had eleven contributed talks:

- ✓ “Angular momentum of the Classical Cepheids and the spiral structure of the Milky Way” by Marcin Semczuk (Barcelona)
- ✓ “Structure, kinematics and time evolution of the Galactic Warp revealed by Classical Cepheids (online) by Mauro Cabrera (Montevideo)
- ✓ “The Outer Arm of the Milky Way from red clump stars” by Namita Uppal (Ahmedabad)
- ✓ “Beyond Gaia DR3: tracing the $[\alpha/M] - [M/H]$ bimodality from the Inner to the outer Milky Way disc with Gaia RVS and Convolutional Neural-Networks” by Guillaume Guiglion (Heidelberg)
- ✓ “Testing the Milky Way's age-metallicity-velocity dispersion relation and the low-mass star age-rotation-activity relation using white dwarf ages” by Alberto Rebassa-Mansergas (Barcelona)
- ✓ “The chemodynamical properties of the Galactic bulge” by Xiaojie Liao (Shanghai)

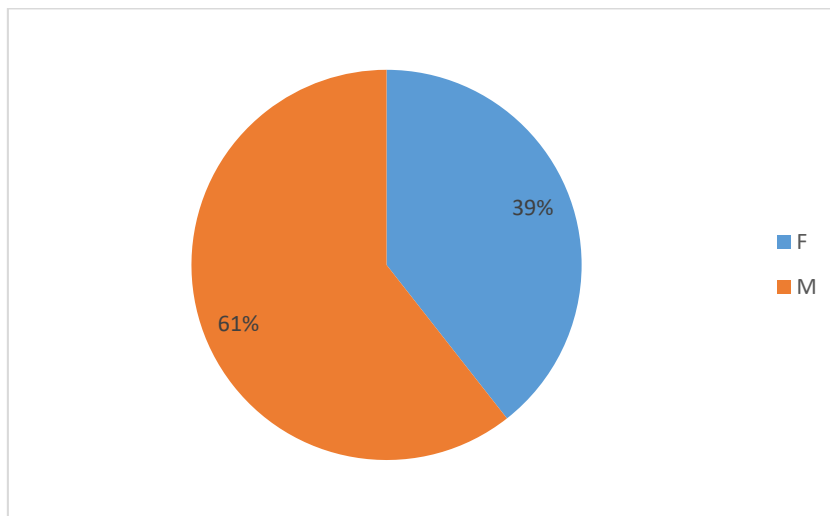
- ✓ “Precise abundances of Mg and neutron-capture elements in the Milky Way: chemodynamical relations using Gaia data and chemical evolution models” by Pablo Santos-Peral (Madrid)
- ✓ “Who is In, and Who is Not? Determining the Gaia Survey Selection Function” by Alfred Castro-Ginard (Leiden)
- ✓ “The mass-loss history of the Sagittarius dwarf galaxy” by Chervin Laporte et al. (Barcelona)
- ✓ “The Large Magellanic Cloud dynamics with high resolution glasses” by Óscar Jiménez Arranz (Barcelona)
- ✓ “Multiple phase spirals suggest multiple origins in Gaia DR3” (online) by Jason Hunt (New York)

And three poster pitches:

- ✓ “The Milky Way disc radial abundance gradient from planetary nebulae revealed by Gaia” (online) Oscar Cavichia (Itajubá)
- ✓ “Chemical footprints of the Galactic spiral arms revealed by Gaia DR3” (online) by Eloisa Poggio (Nice)
- ✓ “Where’s Waldo? Unveiling a metal-poor extension of the Milky Way thin disc with Pristine-Gaia- synthetic” by Isaure Gonzalez Rivera (Nice)

And the conference concluded with the “Final remarks” by Nicholas Walton (Cambridge)

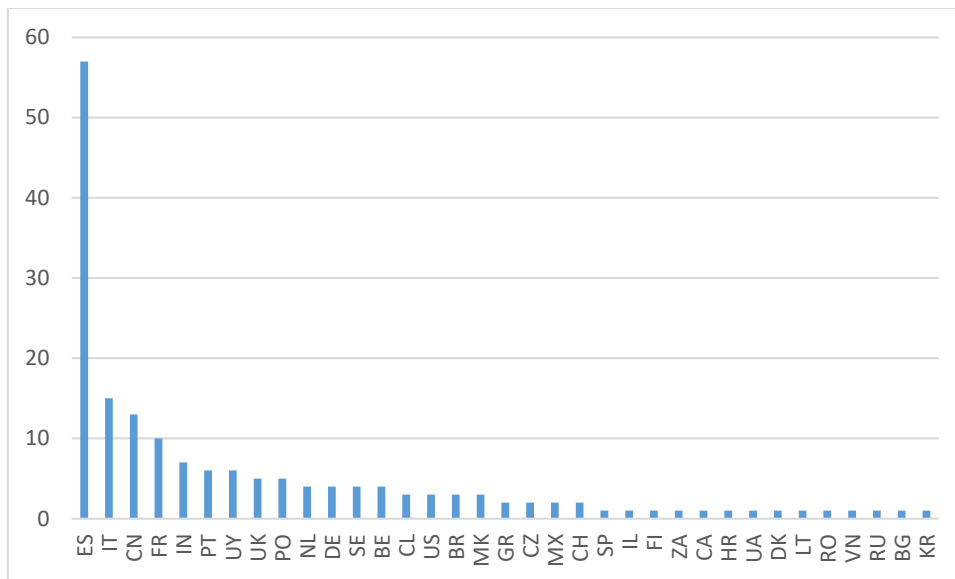
The workshop in numbers



The workshop was attended by 170 researchers (90 remotely, 8 combining both), 39% of them female.

The SOC and LOC had a 58 (7 out of 12) and a 88%(8 out of 9) of female researchers respectively. There were a 50% of female chairs of sessions (5 out of 10).

From the total, 21 participants (12%, including invited speakers) had financial support by the COST Action (52% female).



There were researchers from 35 different countries in Europe (mostly Spain), China, India, Chile, US, Brazil, Mexico, Canada, Vietnam, Korea, South Africa and Israel.

There were 70 presentations. 40% of female participants presented while 42% of male participants did. There were 5 Invited talks (80% female) and 41 Contributed talks (32% female) and 24 posters (42%female).

Regarding career stage there were 58 Early Career Researchers (34% of young researchers) and a 45% of them women.

Participation survey

After the conference a survey was sent to all participants and 54 answered (32%). In general, all the comments were positive from the participants in person and those online. The full set of answers can be found [here](#).

More than 75% of those that answered thought the length of the meeting, the length of the sessions and of the breaks were fair. More than 85% of the answers said the distribution of the sessions, days and overall schedule was satisfactory, good or very good. **More than 85% though the quality** of the invited speakers, contributed talks, general contents and overall quality was **very good or excellent**.

Regarding the interaction with other participants: 80% agree or strongly agree that the questions after each talk were useful and effectively organised, 78% agree or strongly agree that the scientific discussion was interesting and 61% agree or strongly agree that there was enough social interaction between participants besides the talks.

Some said there were too many talks, some complain that it should have been longer time given. The participants in person suffered when the air conditioning broke and made it more uncomfortable but fortunately it did not disturb the normal cadence of the conference.

Regarding participation. The answers came from 78% in person and 37% online (15% from office and 12% from home). A 15% used both possibilities to attend different sessions online or in person. An 89% would have preferred to participate in person, so

an 11% that were online would have preferred to come, that is similar to the percentage of people who had to cancel their in person participation last minute. More than 66% would prefer hybrid for future meetings.

65% attended more than 80% of the sessions. 70% attended the sessions more than 7 hours per day. Most difficulties to attend the conference were due to external duties, and a 30% did not have any difficulties. More than 52% participated in Q&A after talks, discussions or social events. More than 94% felt comfortable or very comfortable when they asked questions. Nobody felt any kind of misconduct or harassment during the meeting. More than 64% presented something on the conference (talk, report or poster)

Regarding the COST Action, more than a 44% were first time participants in a COST activity, and 24% received some financial support from COST. More than 69% of the participants were from COST countries, 12% from ITC countries and 19% International Partner Countries.

From those who answered the survey 60% were male, so extremely similar to the general participants to the conference. 38% were still students and 21% finished in the last 5 years, so a total of 59% of the responders were ESR.

Report prepared by Lola Balaguer-Núñez.

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