



MW-Gaia WG4 Workshop

Science and technology roadmap for μ s studies of the Milky Way

Lund (Sweden), 18th-20th July 2023

The workshop [Science and technology roadmap for \$\mu\$ s studies of the Milky Way](#) took place as hybrid at the Lund Observatory, Sweden, from 18th to 20th July 2023.

This was the fifteenth workshop of the CA18104 COST Action MW-Gaia and the fifth workshop of the Working Group 4 (WG4). The format of the workshop was highly interactive with a preference of in person participation. All presentation can be found at the meeting webpage.

Scientific motivation of the workshop

This workshop presented the Action's science roadmap/case for sub- μ s astrometry in delivering the next advances in our understanding of the Milky Way. The Action influence the future development of Astrometry in Europe. The White Paper to be developed through WG4, will define a science and technical roadmap for the development of next generation astrometry missions. This will be of significant use for exploitation by the European community when responding to opportunities in proposing future space missions, e.g. ESA calls. This workshop involved scientists with interests in next generation Astrometry.

Day One

Session 1: Next generation astrometry in the context of Voyage 2050, had David Hobbs (Lund) as chair and also gave the introductory talk "The GaiaNIR Mission", and three talks:

- ✓ "The JASMINE Mission" by Daisuke Kawata (London)
- ✓ "The Theia Mission" by Fabien Malbet (Grenoble)
- ✓ "A brief review of 70 years with astrometry. From meridian circles to Gaia and beyond" by Erik Høg (Lund)

Session 2: WG1: The Milky Way as a Galaxy: key issues for GaiaNIR, had Xavier Luri (Barcelona) as chair.

- ✓ "Stellar populations in the Galactic bulge: orbital-chemical analysis" by Cristina Chiappini (Potsdam)
- ✓ "GaiaNIR mock catalogues to study the capabilities towards the inner disc" by Mercè Romero-Gómez & Teresa Antoja (Barcelona)
- ✓ "The Milky Way Halo with GaiaNIR" by Alis Deason (Durham, online)
- ✓ "Massive young open clusters" by Ignacio Negueruela (Alicante)

- ✓ “Galactic Archaeology to its limits“ by Else Starkenburg (Groningen, online)

Day two

Session 3: WG2: The Life and Death of Stars: key issues for GaiaNIR with Gisella Clementini (Bologna) as chair.

- ✓ “RR Lyrae stars as distance indicators and metallicity tracers: impact of Gaia and GaiaNIR” by Tatiana Muraveva (Bologna, online)
- ✓ “Star clusters and the Galactic mid-plane“ by Tristan Cantat (Heidelberg)
- ✓ “Explore the population of metal-rich RR Lyrae stars with GaiaNIR” by Giuliano Iorio (Padova)

Session 4: WG3: Planetary Systems Near and Far: key issues for GaiaNIR with Santi Roca Fàbrega (Lund) as chair.

- ✓ “The Solar System at mas and μ s accuracy” by Paolo Tanga (Nice)
- ✓ “Exoplanet demographics in the 2050s: How does GaiaNIR fit in?” by Alessandro Sozzetti (Torino)
- ✓ “Inspection of exoplanetary system properties near and far” by René Heller (Göttingen, online)
- ✓ “Lessons learned from Gaia toward μ s astrometry on small solar system bodies” by Daniel Hestroffer (Paris)

Session 5: WG5: Impact, Inclusiveness and Outreach: building the GaiaNIR community inclusively, with Sergei Klioner (Dresden) as chair.

- ✓ “Beyond the Data: Engaging the Public with Astrometry Missions through Visualisations and Fascinating Insights” by Stefan Jordan (Heidelberg)
- ✓ “Engaging minorities in science: A Latin American perspective” by Luis Aguilar (Mexico)
- ✓ “Gaia mission: challenges in communication for large data releases” by Tineke Roegiers (Leiden)

Session 6: WG4: Gaia Fundamentals: Space and Time: key issues for GaiaNIR with Sonia Anton (Coimbra) as chair.

- ✓ “A new experiment in near-field cosmology” by Joss Bland-Hawthorn (Sydney, online)
- ✓ “Developments of relativistic aspects of Gaia for next generation astrometry” by Sergei Klioner (Dresden)
- ✓ “Influence and detection of gravitational waves in Gaia-like astrometry” by Robin Geyer (Dresden)
- ✓ “The Gaia bright reference frame using binaries” by Eero Vaher (Lund)

Day three

Session 7: Technical challenges with Nic Walton (Cambridge) as chair.

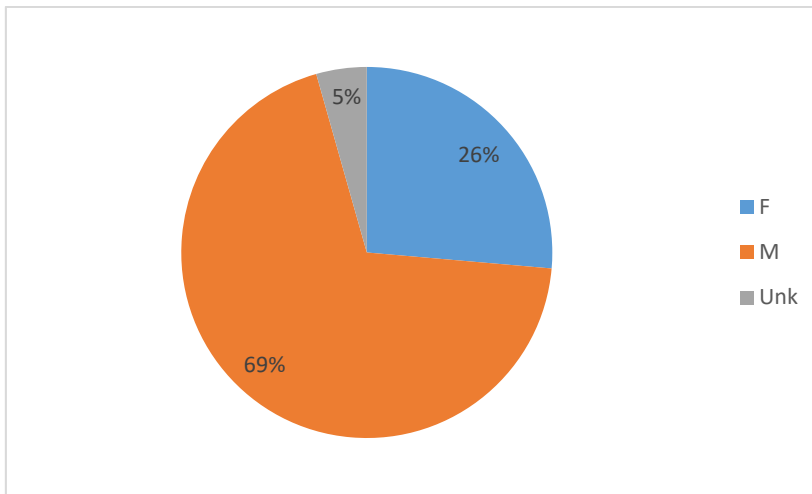
- ✓ “NIR Detector options” by Guy Rixon (Cambridge)
- ✓ “GaiaNIR Photometric Systems” by Josep Manel Carrasco (Barcelona)
- ✓ “Infrared Full Sky Scanning Mission as a Data Processing Challenge” by Wolfgang Loeffler (Heidelberg)

- ✓ “Experiences from the Gaia in-flight instrument modelling and suggestions for GaiaNIR” by Nicholas Rowell (Edinburgh)
- ✓ “Detection of multiple stellar systems from modern-precision single-epoch photometry” by Gregor Traven (Ljubljana)

Session 8: GaiaNIR discussion, challenges, and next steps. Chairs of the session David Hobbs (Lund) & Nic Walton (Cambridge)

- ✓ How does GaiaNIR rank in national funding programs?
- ✓ Open discussion on who needs to do what first
- ✓ Roadmap towards an L5 proposal

The workshop in numbers

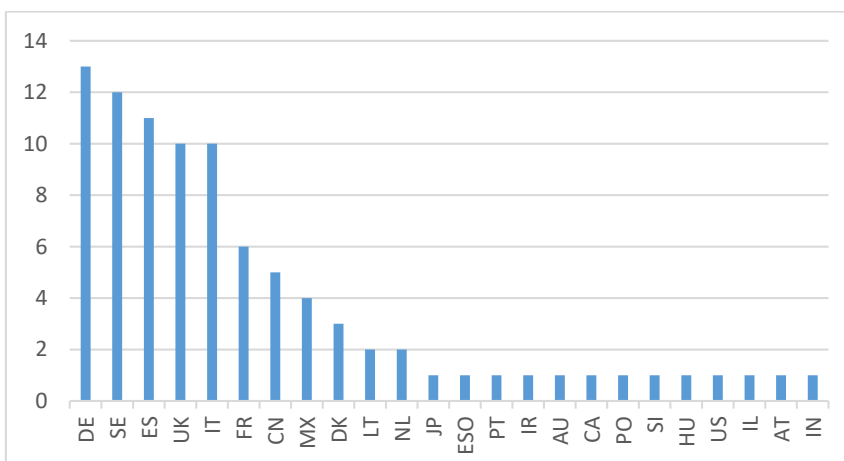


The workshop was attended by 91 researchers (41 remotely, 45%), 26% of them female (5% unknown).

The SOC and LOC had a 44 (4 out of 9) and a 20% (1 out of 5) of female researchers respectively.

There were 8 chairs, 2 (25%) of them female.

From the total, 5 participants (5%, including invited speakers) had financial support by the COST Action (40% female).



There were researchers from 24 different countries in Europe (mostly from Germany and Sweden) and China, Mexico, Japan, Chile, Australia, Canada, India, US and Israel.

There were 30 presentations (20% female). 25% of female participants presented while 38% of male participants did.

Report prepared by Lola Balaguer-Núñez.

Images:

https://www.astro.lu.se/sites/astro.lu.se/files/styles/lu_wysiwyg_full_desktop/public/2023-02/PillarsOfCreation_0.jpg.webp?itok=lyOnPgO-

Group photo:

https://www.astro.lu.se/sites/astro.lu.se/files/styles/lu_wysiwyg_full_desktop/public/2023-07/GroupPhoto.jpg.webp?itok=2IUqQH8L