

Projects:

1. [The Gaia-LSST Synergy: from pulsating stars and star formation history to WD planets](#)

Members: [Gisella Clementini](#), [Michele Cignoni](#), [Felice Cusano](#), [Alessia Garofalo](#),
[Tatiana Muraveva](#)

Associated members: [Vincenzo Ripepi](#), [Roberto Silvotti](#)

2. [RR Lyrae, Cepheids and Luminous Blue Variables to constrain theory using LSST observations](#)

Members: [Ilaria Musella](#), [Maria Ida Moretti](#),

Associated members: [Marcella Marconi](#), [Marco Limongi](#), [Alessandro Chieffi](#).

GOALS:

Select a number of fields/targets within the reach of both Gaia and LSST, known to contain pulsating variable stars of different types spanning the whole classical instability strip (namely: RR Lyrae, Cepheids of different types, SX Phoenicis and Delta Scuti) for which both Gaia and other surveys' multi-band photometry, astrometry and spectroscopy already exist (with related extensive databases already available to us from the work in Gaia) or will soon become available to:

1. intercalibrate LSST/Gaia/etc. datasets
2. define the best cadence to optimally sample the light curve variation of the different types
3. test depth and completeness of the LSST observations in the selected fields to the purpose of star formation recovery
4. optimally translate different diagnostics used to characterize the above variability types and the theoretical tools into LSST passbands
5. compare LSST magnitude limits and performance with respect to Gaia in region of high crowding/absorption and optimize the related observations
6. quality assurance of the products (light curves, pulsation parameters etc.)

PROPOSED TARGETS (specific coordinates and number of fields to be finalized after Gaia DR2, on 25 April 2018)

1. a few selected fields with deep and multi-phase observations in the Magellanic System (LMC+SMC+Bridge and stream)
2. a few fields in properly selected classical dSphs (likely 1 field in Sculptor and 3 in Sagittarius or other systems/regions, to be finalized after Gaia DR2)
3. a few fields selected on globular clusters, ultrafaint dwarfs and streams (1 field in each system)

MILESTONES:

1. selection of specific targets (to be completed after Gaia DR2)
2. definition of exposure length, S/N limits, cadence
3. coordination with other groups interested in other targets in the same fields

DELIVERABLES:

1. Consolidated list of targets
2. Number of pointings and optimized cadence (scanning law) of the observations x each specific field
3. Tests on performance of different variability detection algorithms and tools (e.g. different classifier such as Random Forest, Bayesian network etc.)
4. Intercalibration relations
5. Theoretical tools into the LSST passbands
6. Quality assurance and validation tasks

TIME FRAME:

3 months from March 1st to May 31st (as in the Gantt chart that will follow later).