

Gaia-ESO progress update – open clusters

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The consortium is growing

- 400++ CoIs
- 95+ institutes
- 19 working groups
- active wiki communications:
300+ users
130+ visits/day



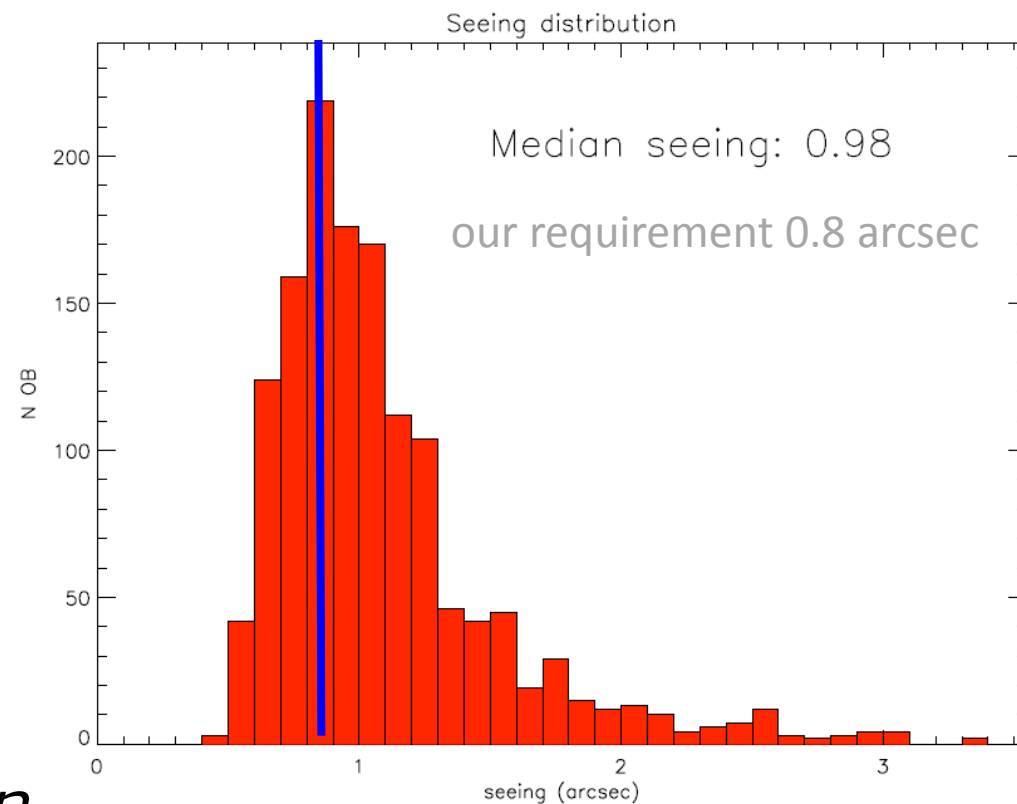
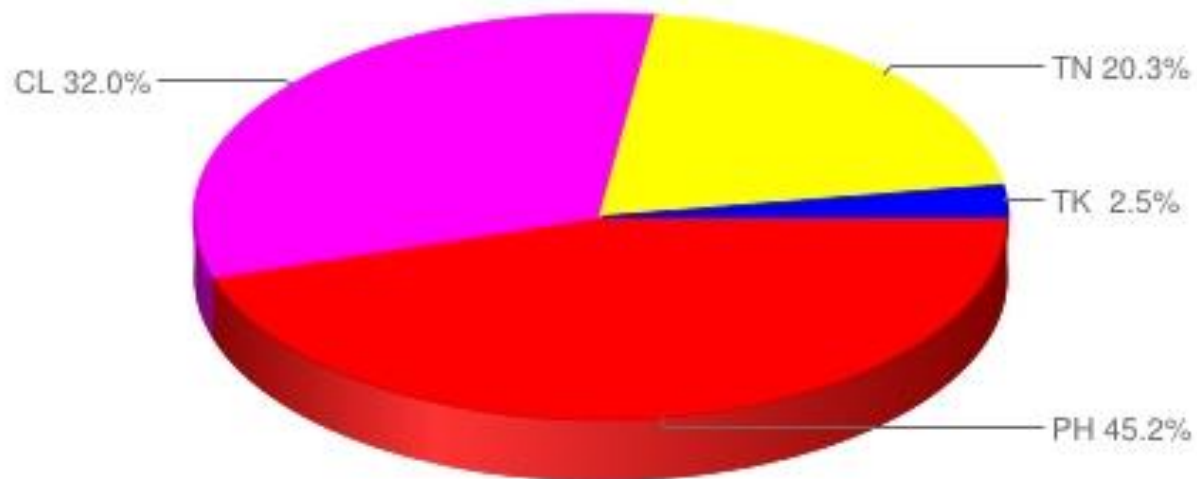
Co-PIs: Gerry Gilmore¹³⁷⁰, Sofia Randich¹³³⁵
CoIs: M. Asplund¹⁴⁹⁰, J. Binney¹⁶¹¹, P. Bonifacio¹⁵⁸⁸, J. Drew¹⁶⁶⁸, S. Feltzing¹⁴⁷³, A. Ferguson¹⁶⁴⁹, R. Jeffries¹¹³², G. Micela¹³⁴⁴, I. Negueruela⁷⁶⁰⁹, T. Prusti¹²⁷⁸, H-W. Rix¹⁴⁸⁹, A. Vallenari¹³⁴³, D. Aden¹⁴⁷³, L. Affer¹³⁴⁴, J-M. Alcalá¹³⁴⁰, E. Alfaro¹³⁰², C. Allende Prieto¹³⁰³, G. Altavilla⁷⁵³⁰, J. Alves¹⁸⁰³, T. Antoja¹⁴²², F. Arenou¹⁵⁸⁸, C. Argiroffi¹⁸⁸³, A. Asensio Ramos¹³⁰³, C. Babusaux¹⁵⁸⁸, C. Baller-Jones¹⁴⁸⁹, L. Balaguer-Nunez¹⁸²¹, B. Barbuy¹⁸²⁸, G. Barisevicius¹³⁷⁶, D. Barrado v Navascues¹⁰⁸⁸, C. Battistini¹⁴⁷³, I. Bellas-Velidis¹⁵⁵⁵, M. Bellazzini¹³²⁹, V. Belokurov¹³⁷⁰, M. Bergemann¹⁴⁹⁰, G. Bertelli¹³⁴³, K. Biazzo¹³³⁵, O. Bienayme¹⁵⁸², J. Bland-R. Blomme¹⁶⁵⁰, C. Boeche²¹¹², S. Bonito¹³⁴⁴, S. Boudresult¹²⁴², J. Bouvier¹⁴⁴⁹, I. Brandao¹²⁰⁰, A. Brown¹⁷¹⁶, J. de Brujine¹²⁷⁸, M. Burleigh¹²⁴⁴, J. Caballero¹²⁶¹, F. Calura¹¹⁹⁷, R. Capuzzo-Dolcetta¹⁸⁵⁷, M. Caramazza¹³⁴⁴, G. Carraro¹²⁶¹, S. Casewell¹²⁴⁴, S. Chapman¹³⁷⁰, C. Chiappini¹¹³⁵, Y. Chorniy¹³⁷⁶, N. M. Cignoni⁷⁵³⁰, G. Cocozza⁷⁵³⁰, M. Colless¹⁰¹⁷, R. Collet¹⁴⁹⁰, M. Collins¹⁴⁸⁹, M. Covino¹³⁴⁰, D. Crnojevic¹⁶⁴⁹, M. Cropper¹²⁴², M. Cunha¹²⁰⁰, F. Damiani¹³⁴⁴, L. Delgado¹⁵⁰², S. Duffau²¹¹², S. Van Eck¹³⁵⁸, B. Edvardsson⁶¹⁸¹, H. Enke¹¹³⁵, N.W. Evans¹³⁷⁰, L. Eyer¹³⁷⁷, B. Famaey¹⁵⁸², M. Fellhauer¹⁸²⁴, I. Ferreras¹²⁴², G. Fiorentino¹⁴²², E. Flaccomio¹³⁴⁴, C. Flynn²⁰⁴⁴, D. Folho¹²⁰⁰, E. Franciosini¹³³⁵, A. Frasca¹³⁴¹, K. Freeman¹¹³⁹, Y. Fremat¹⁶⁵⁰, B. Gaensicke¹²⁴¹, J. Gameiro¹²⁰⁰, S. Geier⁵⁶⁷⁷, D. Geisler¹⁸²⁴, B. Gibson¹¹⁹⁷, A. Gomboc¹⁹⁹⁵, A. Gomez¹⁵⁸⁸, R. Gonzalez Hernandez¹³⁹³, E. Grebel²¹¹², R. Greimel¹⁴²³, M. Grundahl¹³⁸⁸, M. Guarcello¹³¹², B. Gustafsson²⁰⁷⁹, P. Hadrava¹¹¹⁶, D. Hambly¹⁶⁴⁹, P. Hammersley¹²⁵⁸, C. Hansen²¹¹², M. Haywood¹⁵⁸⁸, U. Heiter⁶¹⁸¹, A. Helmi¹⁴²², G. Hensler¹⁸⁹³, A. Herrero¹³⁹³, V. Hill¹⁵⁰¹, S. Hodgkin¹³⁷⁰, N. Huelamo⁸⁵⁴⁵, A. Huxor²¹¹², R. Ibata¹⁵⁸², M. Irwin¹³⁷⁰, R. Jackson¹¹³², R. de Jong¹¹³⁵, P. Jonker¹⁶⁸⁰, S. Jordan²¹¹², C. Jordi¹⁸²¹, A. Jorissen¹³⁵⁸, D. Katz¹⁵⁸⁸, D. Kawata¹²⁴², S. Keller¹¹³⁰, N. Kharchenko¹¹³⁵, R. Klement¹⁴⁸⁰, A. Klutsch¹⁸⁰³, J. Knude¹⁹⁶⁶, A. Koch¹²⁴⁴, O. Kochukhov⁶¹⁸¹, M. Kontizas¹⁵⁶⁰, S. Koposov¹³⁷⁰, A. Korn⁶¹⁸¹, P. Koubzky¹¹¹⁶, A. Lanzafame¹⁸⁷⁴, R. Lallement¹⁵⁸⁸, P. de Laverny¹⁵⁰¹, F. van Leeuwen¹³⁷⁰, B. Lemasle¹⁴²², G. Lewis²⁰⁴⁴, K. Lind¹⁴⁹⁰, H.P.E. Lindstrom¹⁹⁶⁶, J. Lopez Santiago¹⁸⁰³, P. Lucas¹⁶⁶⁸, H. Ludwig²¹¹², T. Lueftinger¹⁸⁹³, L. Magrini¹³³⁵, J. Maiz Apellaniz¹³⁹², J. Maldonado¹⁸⁰³, G. Marconi¹²⁶¹, G. Matijevic¹⁹⁹⁵, R. McMahon¹³⁷⁰, S. Messina¹³⁴¹, M. Meyer¹³⁷⁷, A. Miglio¹³⁵⁹, S. Mikolaitis¹³⁷⁶, I. Minchev¹¹³⁵, D. Minniti¹⁸⁰¹, A. Moitinho⁸⁸⁴⁸, N. Molawi¹⁵⁵³, Y. Momany¹²⁶¹, L. Monaco¹²⁶¹, M. Montalto¹²⁰⁰, M.J. Monteiro¹²⁰⁰, R. Monier⁵⁶⁹⁵, D. Montes¹⁸⁰³, A. Mora¹³⁵⁰, E. Moraux¹⁴⁴⁹, T. Morel¹³⁵⁹, A. Morino¹⁴⁹⁰, N. Mowlavi¹⁵⁸³, A. Mucciarelli⁷⁵³⁰, U. Munari¹³⁴³, R. Napiwotzki¹⁶⁶⁸, N. Nardetto¹⁸²⁴, T. Naylor¹¹³⁰, G. Nelemans¹⁶³⁸, S. Okamoto¹⁶¹⁶, S. Ortolani⁶³¹¹, G. Pace¹²⁰⁰, F. Palla¹³³⁵, J. Palous¹¹¹⁶, E. Pancino¹³³⁷, R. Parker¹³⁷⁷, E. Paunzen¹⁸⁹³, J. Penarrubia¹⁸²⁸, I. Pillitteri¹³¹², G. Piotto¹³⁴³, H. Posbic¹⁵⁸⁸, L. Prisinzano¹³⁴⁴, E. Puzeras¹³⁷⁶, A. Quirrenbach²¹¹², S. Ragaini⁷⁵³⁰, D. Ramano¹³³⁷, J. Read¹³⁷⁷, M. Read¹⁶⁴⁹, A. Recio-Blanco¹⁵⁰¹, C. Reyles¹⁵⁹², N. Robichon¹⁵⁸⁸, A. Robin¹⁵⁹², S. Roeser²¹¹², F. Royer¹⁵⁸⁸, G. Ruchti¹⁴⁹⁰, A. Ruzicka¹¹¹⁶, S. Ryan¹⁶⁶⁸, N. Ryde¹⁴⁷³, G. Sacco¹⁶⁴⁵, N. Santos¹²⁰⁰, J. Sanz Forcada¹⁴⁵⁶, L.M. Sarro Baro⁵⁶⁸⁸, L. Sbordone¹¹³⁰, E. Schilbach²¹¹², S. Schmeja²¹¹², O. Schnurr¹¹³⁵, R. Schoenrich¹⁴⁹⁰, R-D. Scholz¹¹³⁵, G. Seabroke¹²⁴², S. Sharma²⁰⁴⁴, G. De Silva¹⁰¹⁷, R. Smljanic¹²⁶⁸, M. Smith¹⁶¹⁶, E. Solano⁸⁵⁴⁵, C. Soubiran¹⁵⁹², S. Sousa¹²⁰⁰, A. Spagna¹³⁴⁶, M. Steffen¹¹³⁵, M. Steinmetz¹¹³⁵, B. Stelzer¹³⁴⁴, E. Stempels⁶¹⁸¹, H. Tabernero¹⁸⁰³, G. Tautvaisiene¹³⁷⁶, F. Thevenin¹⁵⁹¹, J. Torra¹⁸²¹, M. Tosi¹³³⁷, E. Tolstoy¹⁴²², C. Turon¹⁵⁸⁸, M. Walker¹³¹², N. Walton¹³⁷⁰, J. Wambsganss²¹¹², C. Worley¹⁵⁹¹, K. Venn²⁰⁶¹, J. Vink¹¹¹¹, R. Wyse¹⁴¹⁹, S. Zaggia¹³⁴³, W. Ziegler¹⁸⁹³, M. Zoccali¹⁸⁰¹, J. Zorec¹³⁶¹, D. Zucker¹⁴⁷⁷, T. Zwitter¹⁹⁹⁵

Outline

- Observations and target sample
- Operations
- Analysis cycles and releases
- Management
- Science ...-only a few remarks
- Focus on open cluster progress

Observations - statistics

- 31 observing runs completed (since Jan. 2012) = 172/300 nights
- time lost: 15 % weather, 2.4 % tech., 2.8 % ToOs → 35 nights

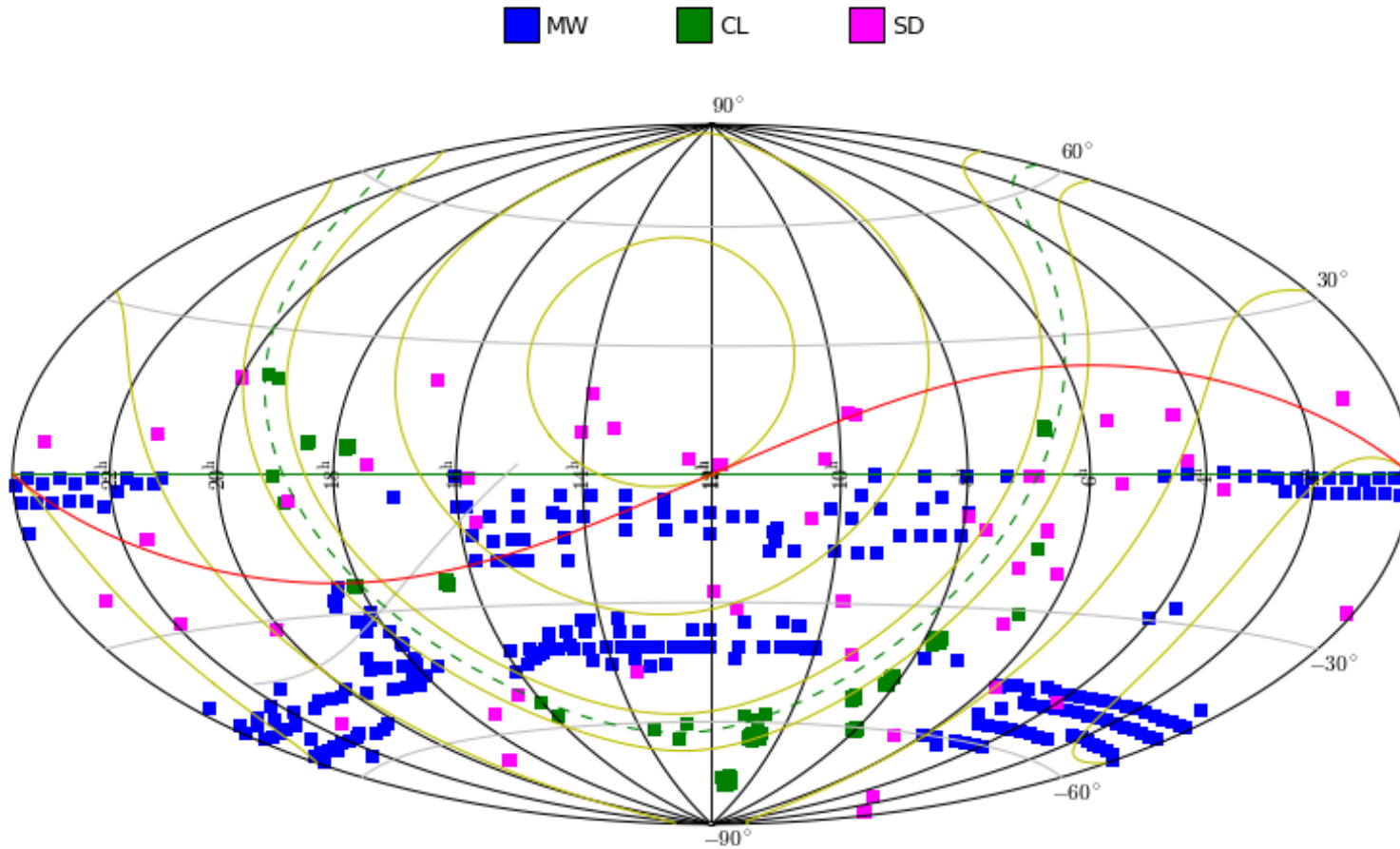


Statistics updated up to next to the last run

Observations – target sample (up to July 2014)

- ~**53,000** (21,000 CL) science targets
- ~48000 Giraffe (int. res), ~5000 UVES (high res)
- > **5000 calibrators** (RVs, benchmarks, GCs, CoRoT giants)
- **27** open clusters completed/started
- Wide **variety of MW fields**: outer thick disc --> Bulge
- Several **x 1000 spectra** from **ESO archive**
- **SNR distributions “stable”**

Observations – target sample



Operations (3 cycles completed, cycle 4 starting)

- **Data Reduction and RVs:**
 - ▶ **CASU: 8 Giraffe setups** - new pipeline developed –ok, but sky subtraction; goal RV accuracy achieved
 - ▶ **Arcetri: 3 UVES setups** - partnership with ESO –ok; 520nm not perfect yet
- **Spectrum Analyses and homogenization**
 - ▶ Model atmospheres, synthetic spectra, and line list (version control) -ok
 - ▶ Implementation of multi-purpose Fixed Format FITS template –ok
 - ▶ WG recommended parameters, through node result combination -ok
 - ▶ Top-level Survey-wide homogenisation team –ok, **achieved for DR2 APs**
 - ▶ **CoRoT** analysis proceeding in **parallel**
 - ▶ **iDR4 kick-off meeting (Sept. 2014):** several things to be improved identified
- **Edinburgh Archive (WFAU):** –ok (but long timescales), new data-model for iD4

See talks by A. Korn, R. Blomme, C. Davenhall, T. Masseron, K. Lind, P. Jofre

Analysis cycles and releases

INTERNAL RELEASES OF SPECTRA
RVs, PHOTOMETRY, ETC.

INTERNAL RELEASES OF
PRODUCTS

RELEASES TO ESO



Analysis cycles

Analysis cycles and releases

INTERNAL RELEASES OF SPECTRA
RVs, PHOTOMETRY, ETC.

iDR1: 6 months
9/2012 ✓

iDR2: 18 months
7/2013 ✓

iDR3: 24 months
3/2014 incremental ✓

iDR4: 31 months
to start **now**

Analysis cycles and releases

INTERNAL RELEASES OF SPECTRA
RVs, PHOTOMETRY, ETC.

INTERNAL RELEASES OF
PRODUCTS

iDR1: 6 months
9/2012 ✓

WG rec. APs + abun.
8/2013 ✓

iDR2: 18 months
7/2013 ✓

Hom. APs, WG rec. or
node abun., 7/14 ✓

iDR3: 24 months
3/2014, incremental ✓

Hom. APs, WG rec. or
node abundances

iDR4: 31 months
to start now

Hom. APs + abundances
Spring 2015

Analysis



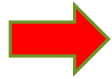
Analysis cycles and releases

INTERNAL RELEASES OF SPECTRA
RVs, PHOTOMETRY, ETC.

INTERNAL RELEASES OF
PRODUCTS

RELEASES TO ESO

iDR1: 6 months
9/2012 ✓



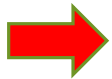
WG rec. APs + abun.
8/2013 ✓

iDR2: 18 months
7/2013 ✓



Hom. APs, WG rec. or
node abun., 7/14 ✓

iDR3: 24 months
3/2014 incremental ✓



Hom. APs, WG rec. or
node abundances

iDR4: 31 months
to start now



Hom. APs + abundances
Spring 2015

selected iDR1 spectra
8/2013 (11/2013) ✓

spectra up to Dec.
2013; iDR2 and iDR3
products.
< 15/2/2015

Management

- Last SC meeting Feb. 2014 – no major issues since then
- PI telecons with spectrum analysis WGs since iDR3
- ESO/PSSP 2nd year review:
 - ▶ report sent at the beginning of April 2014
 - ▶ review at ESO on April 30 2014: EXTREMELY POSITIVE FEEDBACK →

*The **Gaia-ESO** survey is a **particularly notable success**....the decision to force a **collaborative effort** between two initially disjoint proposals....proved **advantageous** for all concerned. The **legacy value of the survey data seems incontestable now that Gaia is operating successfully in orbit**. Gaia-ESO has currently completed about 1/3 of their envisaged programme, and it will be **important that they get sufficient time (including weather compensation) to complete systematic coverage of Milky Way populations as originally envisaged**.*

- Standard report to ESO/OPC submitted on Nov. 4

SCIENCE EXPLOITATION

this meeting !

Science exploitation - statistics

- Bottom up approach: 100++ Col science **projects** posted on wiki
- **32 refereed papers** (2/3 published/accepted) since August 2013; science + data release papers; several papers lead by students/young post-docs
- 4 A&A highlights + 3 A&A cover pages
- 2 Messenger articles
- Several presentations at meetings

The Gaia-ESO Survey: Abundance ratios in the inner-disk open clusters Trumpler 20, NGC 4815, NGC 6705*

L. Magrini¹, S. Randich¹, D. Romano², E. Friel³, A. Bragaglia², R. Smiljanic^{4,5}, H. Jacobson⁶, A. Vallenari⁷, M. Tosi⁸, L. Spina^{1,8}, P. Donati^{2,9}, E. Maiorca^{14,15}, F. Jiménez-Esteban¹⁶, D. Geisler¹⁷, N. Mowlavi¹⁸, C. Munoz¹⁷, I. San Roman¹⁷, C. Soubiran¹⁵, S. Villanova¹⁷, S. Zaggia⁷, G. Gilmore¹¹, M. Asplund¹⁹, S. Feltzing²⁰, R. Jeffries²², T. Bensby²⁰, P. Francois²¹, S. Koposov^{11,23}, A. J. Korn²⁰, E. Flaccomio¹², E. Pancino^{2,24}, A. Recio-Blanco²⁵, G. Sacco²⁶, M. T. Costado²⁶, E. Franciosini¹, P. Jofre¹¹, P. de Laverny²⁵, V. Hill²⁵, U. Heiter²⁷, A. Hourihane¹¹, R. Jackson²², L. Morbidelli¹, J. Lewis¹¹, K. Lind¹¹, T. Masseron¹¹, L. Prinsinzano¹², C. Worley¹¹

The Gaia-ESO Survey: the most metal-poor stars in the Galactic bulge

L. M. Howes^{1*}, M. Asplund¹, A. R. Casey², S. C. Keller¹, D. Yong¹, G. Gilmore¹, K. Lind^{2,3}, C. Worley², M. S. Bessell¹, L. Casagrande¹, A. F. Marino¹, D. M. Nataf¹, C. I. Owen¹, G. S. Da Costa¹, B. P. Schmidt¹, P. Tisserand¹, S. Randich², A. Vallenari⁶, C. Allende Prieto^{7,8}, T. Bensby⁵, E. Flaccomio⁹, A. Recio-Blanco¹², R. Smiljanic¹³, M. Bergemann², M. U. Heiter³, V. Hill¹², A. Hourihane², P. Jofre², E. Maiorca⁴, T. Masseron², L. Morbidelli⁴

The Gaia-ESO Survey: Kinematic structure in the Gamma Velorum cluster*

R. D. Jeffries¹, R. J. Jackson¹, M. S. Bessell², G. G. Sacco⁶, E. Bragaglia³, G. Micela⁴, E. Alfaro⁵, L. Magrini⁶, L. Morbidelli⁷

The Gaia-ESO Survey: CNO abundances in the open clusters Trumpler 20, NGC 4815, and NGC 6705*

G. Tautvaišienė¹, A. Drazdauskas¹, Š. Mikolaitis^{1,2}, G. Barisevičius¹, E. Puzeras¹, E. Stonkutė¹, Y. Chorniy¹, L. Magrini³, D. Romano⁴, R. Smiljanic^{5,6}, A. Bragaglia⁴, G. Carraro⁷, E. Friel⁸, T. Morel⁹, E. Pancino^{4,10}, P. Donati⁴, F. Jiménez-Esteban¹¹, G. Gilmore¹², S. Randich³, R. D. Jeffries¹³, A. Vallenari¹⁴, T. Bensby¹⁵, E. Flaccomio¹⁶, A. Recio-Blanco², M. T. Costado¹⁷, V. Hill¹², P. Jofre¹², C. Lardo⁴, P. de Laverny², T. Masseron¹², L. Morbidelli³, S. G. Sousa¹⁸, S. Zaggia⁴

The Gaia-ESO Survey: the chemical composition from the first intermediate-age cluster

Š. Mikolaitis^{1,2}, V. Hill¹, A. Recio-Blanco¹, P. de Laverny², D. Romano¹⁰, G. Gilmore³, S. Randich⁴, S. Feltzing⁵, A. Bragaglia¹⁰, E. Flaccomio⁹, A. C. Lanzafame¹¹, E. Pancino¹², M. T. Costado⁸, F. Damiani⁶, A. Hourihane³, P. Jofre³, L. Sbordone¹⁶, S. G. Sousa^{17,1}

Gaia-ESO Survey: Empirical classification of stars in the Gamma Velorum cluster, and calibration of spectral indices

F. Damiani¹, L. Prinsinzano¹, G. Micela¹, S. Randich², G. Gilmore³, J. E. Drew⁴, R. D. Jeffries⁵, Y. Frémat⁶, E. J. Alfaro⁷, T. Bensby⁸, A. Bragaglia⁹, E. Flaccomio¹⁰, A. C. Lanzafame¹⁰, E. Pancino^{9,11}, A. Recio-Blanco¹², G. G. Sacco², R. Smiljanic^{13,14}, R. J. Jackson⁵, P. de Laverny¹², L. Morbidelli², M. T. Costado⁷, P. Jofre³, K. Lind³, and M. T. Costado⁷, P. Jofre³, K. Lind³, and M. T. Costado⁷

The Gaia-ESO Survey: radial metallicity gradients and age-metallicity relation of stars in the Milky Way disk*

M. Bergemann¹, G. R. Ruchti², A. Serenelli³, S. Feltzing², A. Alves-Brito^{4,23}, M. Asplund⁴, T. Bensby², P. Grueters⁵, U. Heiter⁵, A. Hourihane¹, A. Korn⁵, K. Lind¹, A. Marino⁴, P. Jofre¹, T. Nordlander⁵, N. Ryde², C. C. Worley¹, G. Gilmore¹, S. Randich⁹, A. M. N. Ferguson¹⁰, R. D. Jeffries¹¹, G. Micela¹², I. Negueruela¹³, T. Prusti¹⁴, H-W. Rix¹⁵, A. Vallenari¹⁶, E. J. Alfaro²¹, C. Allende Prieto⁷, A. Bragaglia¹⁶, S. E. Koposov^{1,8}, E. Pancino^{17,9}, A. Recio-Blanco¹⁰, R. Smiljanic^{19,20}, N. Walton¹, M. T. Costado²¹, E. Franciosini⁶, V. Hill¹⁸, C. Lardo¹⁷, P. de Laverny¹⁸, G. G. Sacco⁶, G. Kordopatis¹, and C. Lardo¹⁴, K. Lind², and E. Maiorca⁶

The Gaia-ESO Survey: the Galactic Thick to Thin Disc transition*

A. Recio-Blanco¹, P. de Laverny¹, G. Kordopatis², A. Helmi³, V. Hill¹, G. Gilmore², R. Wyse⁴, V. Adibekyan⁵, S. Randich⁶, M. Asplund⁷, S. Feltzing⁸, R. Jeffries⁹, G. Micela¹⁰, A. Vallenari¹¹, E. Alfaro¹², C. Allende Prieto¹³, T. Bensby⁸, A. Bragaglia¹⁴, E. Flaccomio¹⁰, S. E. Koposov^{2,20}, A. Korn¹⁵, A. Lanzafame¹⁶, E. Pancino^{14,17}, R. Smiljanic^{18,19}, R. Jackson⁹, J. Lewis², L. Magrini⁶, L. Morbidelli⁶, L. Prinsinzano¹⁰, G. Sacco⁶, C. C. Worley², A. Hourihane², M. Bergemann², M. T. Costado¹², U. Heiter¹⁵, P. Jofre², C. Lardo¹⁴, K. Lind², and E. Maiorca⁶

Gaia-ESO Survey: the Galactic Thick to Thin Disc transition*


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The Gaia-ESO Survey: metallicity of the Chamaeleon I region*


L. Spina¹, S. Randich¹, F. Palla¹, K. Biazzo², G. G. Sacco¹, E. J. Alfaro³, E. Franciosini¹, L. Magrini¹, L. Morbidelli⁷, A. Frasca⁴, V. Adibekyan⁴, E. Delgado-Mena⁴, S. G. Sousa^{4,5}, J. I. González Hernández^{6,7}, D. Montes⁸, I. Tabernero⁸, G. Tautvaišienė⁹, R. Bonito¹⁰, A. C. Lanzafame¹¹, G. Gilmore¹², R. D. Jeffries¹³, A. Vallenari¹⁴, T. Bensby¹⁵, A. Bragaglia¹⁶, E. Flaccomio¹⁰, A. J. Korn¹⁷, E. Pancino^{16,18}, A. Recio-Blanco¹⁹, R. Smiljanic²⁰, M. Bergemann¹², M. T. Costado³, F. Damiani¹⁰, V. Hill¹⁹, A. Hourihane¹², P. Jofre¹², P. de Laverny¹⁹, C. Lardo¹⁶, T. Masseron¹², L. Prinsinzano¹⁰, C. C. Worley¹²

Top level science goals addressed + many unanticipated results

Publication policy reminder



The only astrophysical parameters which may be analysed in a publication are the “best” parameters: photometric, spectroscopic, astrophysical parameters, elemental abundances, velocities, etc, and their random and systematic uncertainties, held in the Survey archive. Publication based on any other data requires prior special agreement with the Co-PIs.

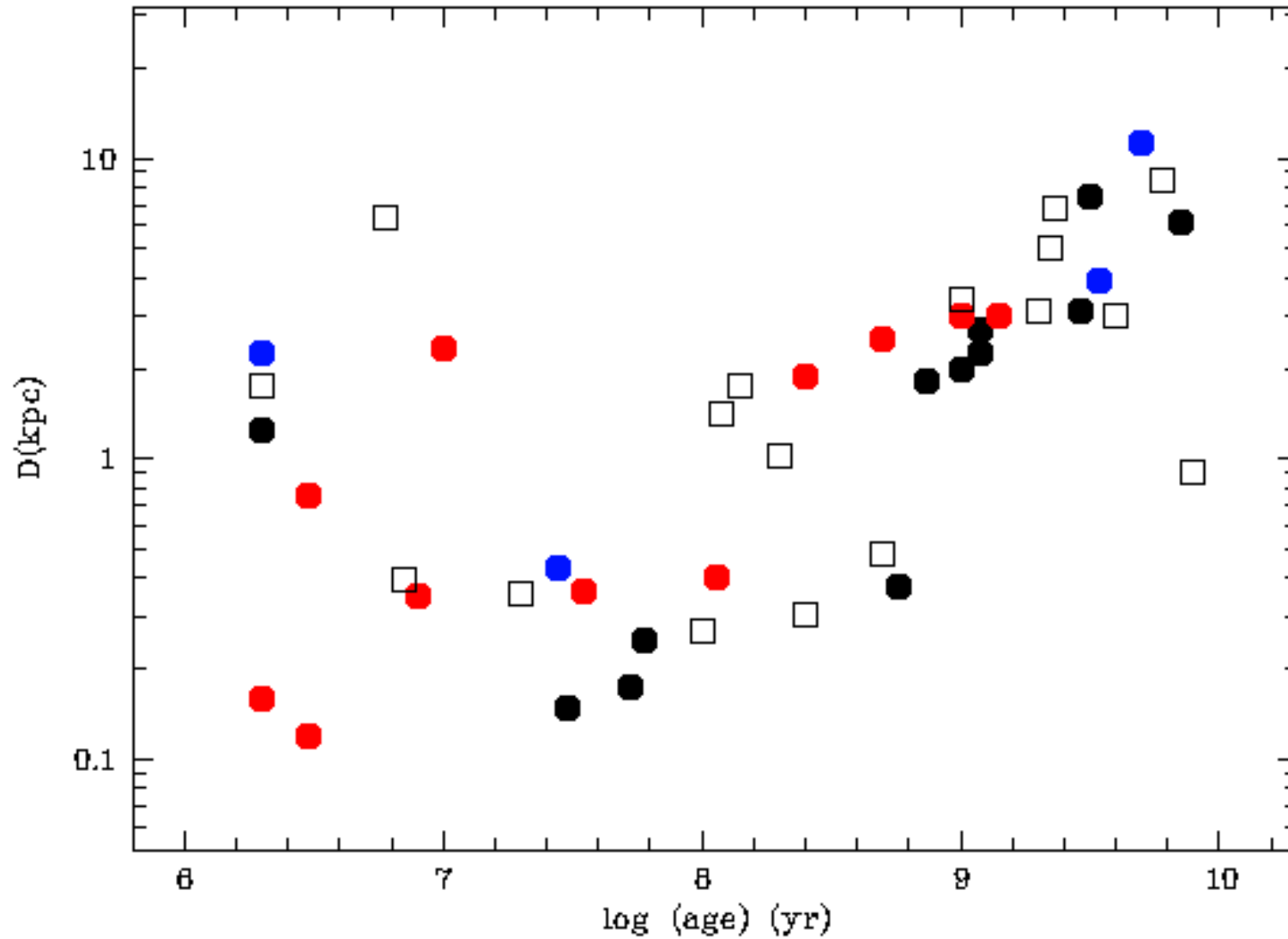


- Note: “best” parameters are not necessarily WG15 recommended one; instructions on the parameters that can be used are given by the PIs in the release announcement
- ask the PIs **before** writing papers

Update on open clusters

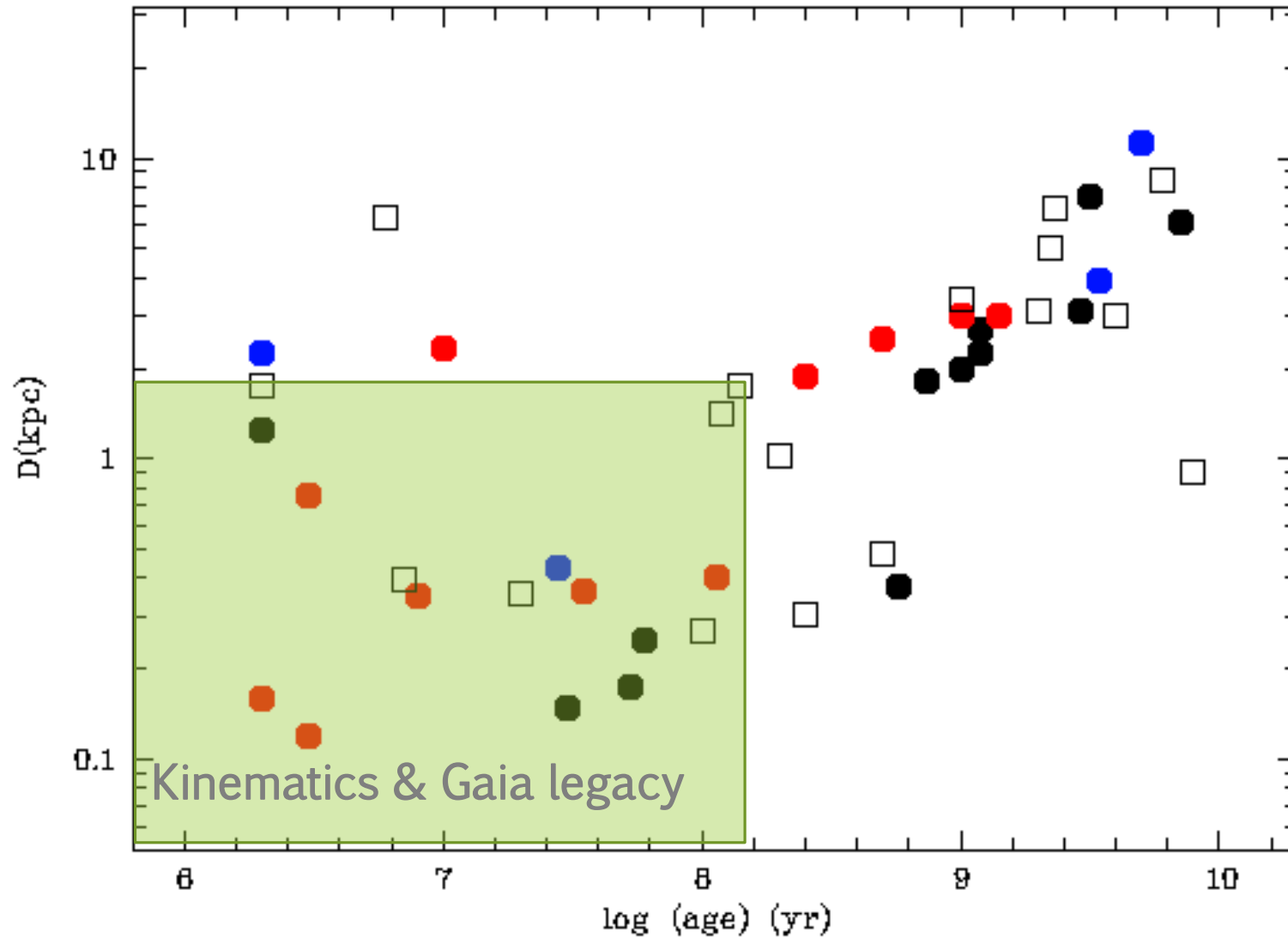
Observed cluster sample

- iDR2
- iDR3
- iDR4
- protected



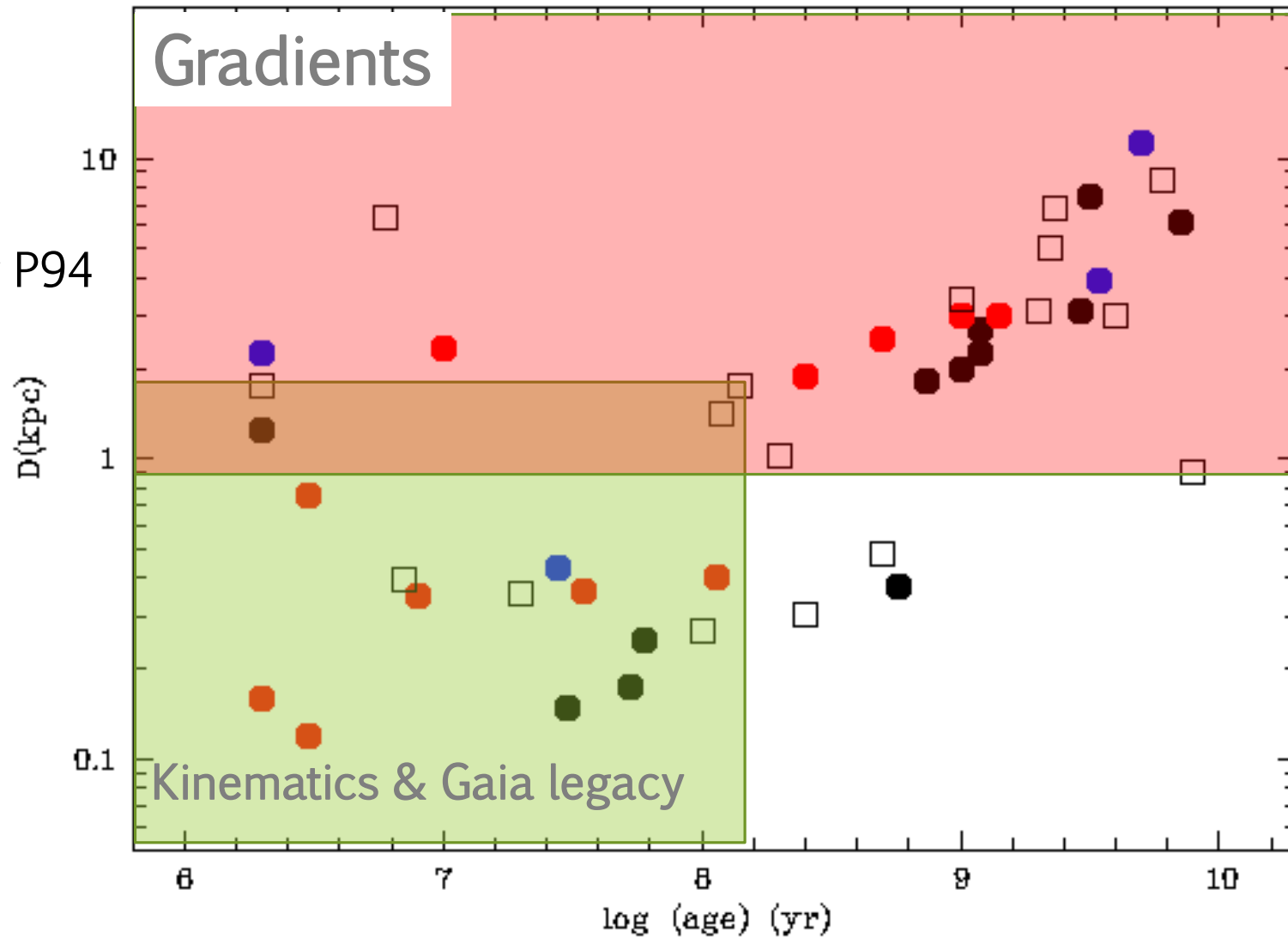
Observed cluster sample

- iDR2
- iDR3
- iDR4
- protected



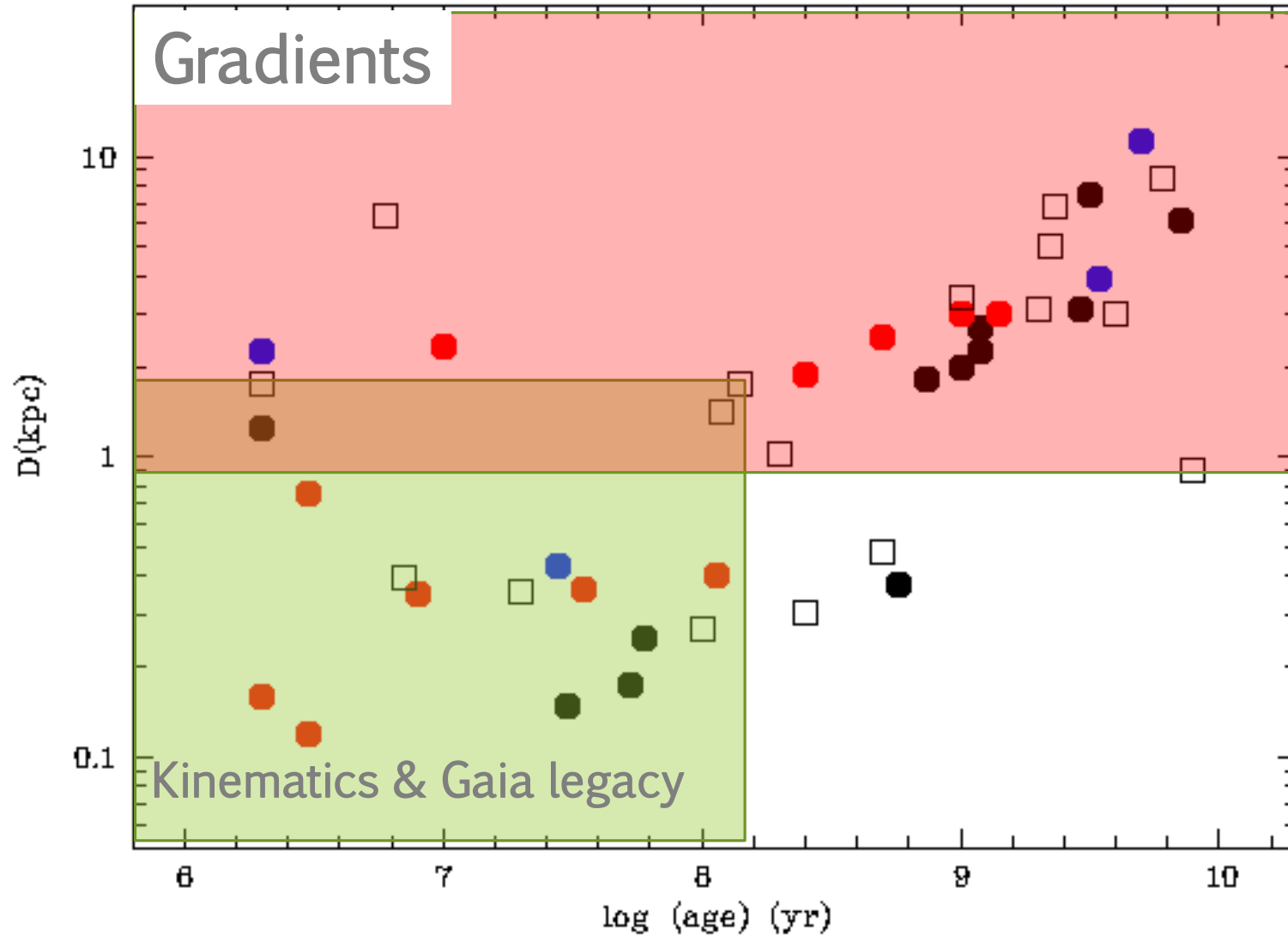
Observations – cluster sample

- iDR2
- iDR3
- iDR4
- protected for P94 and P95



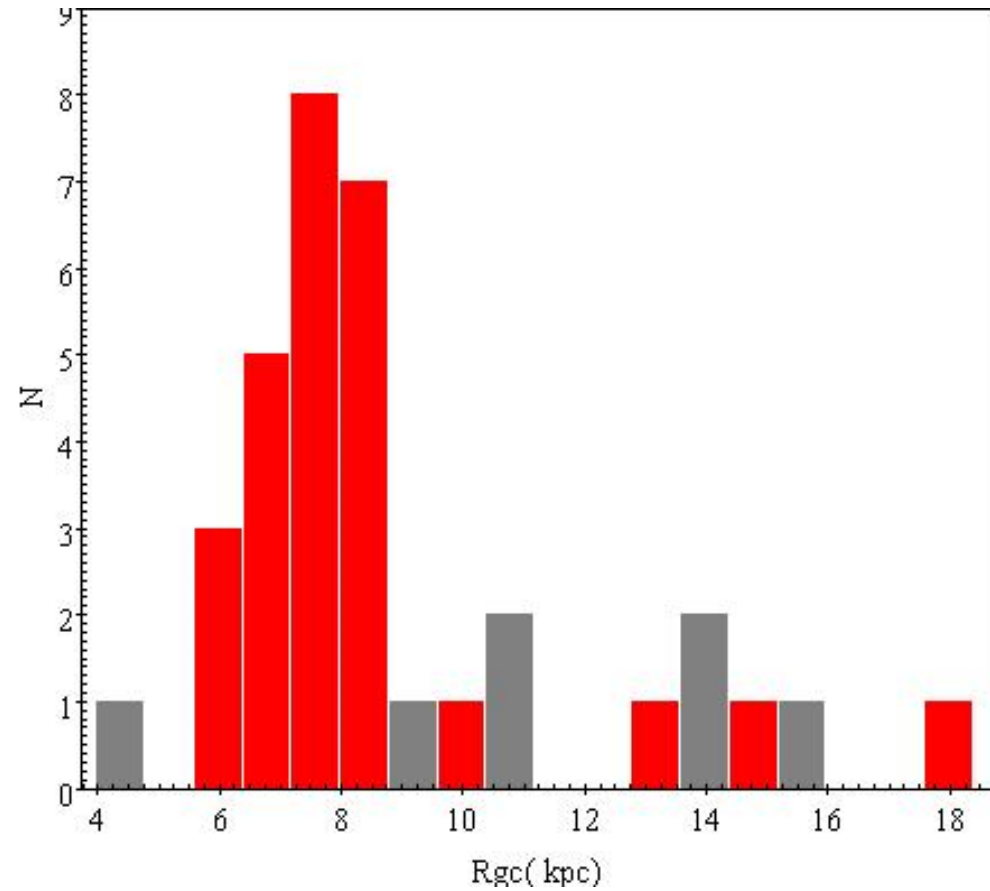
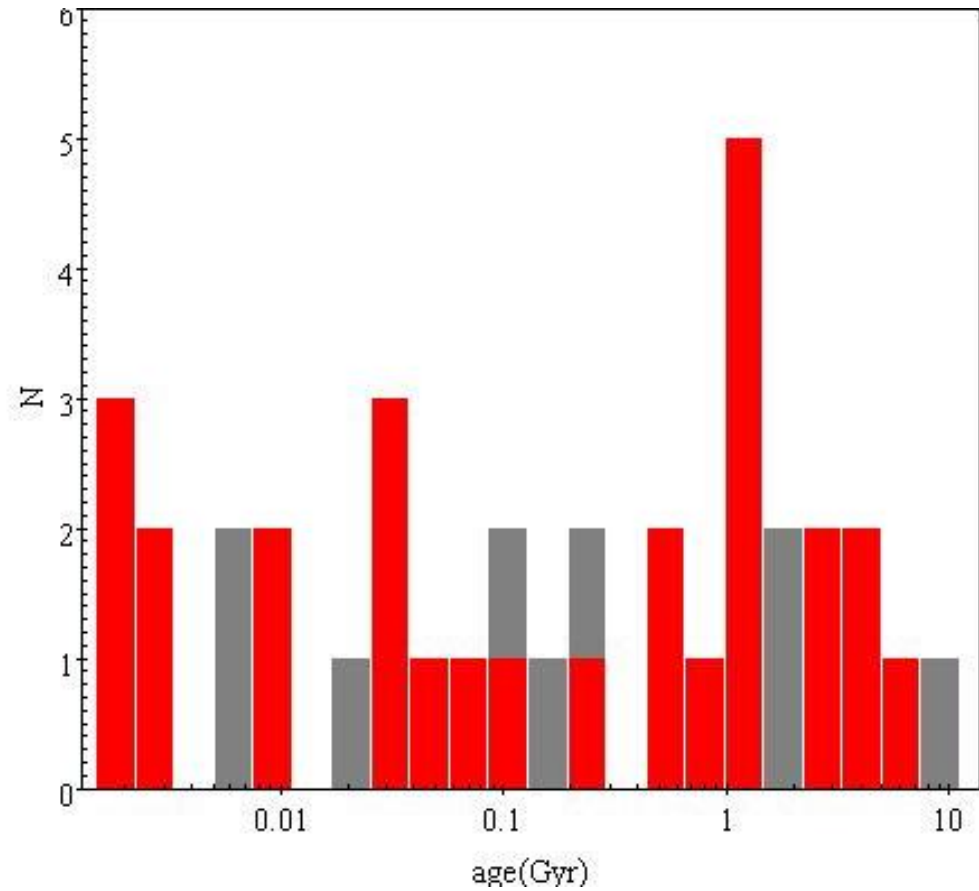
Observed cluster sample

- iDR2
- iDR3
- iDR4
- protected



All: stellar evolution

Observed cluster sample

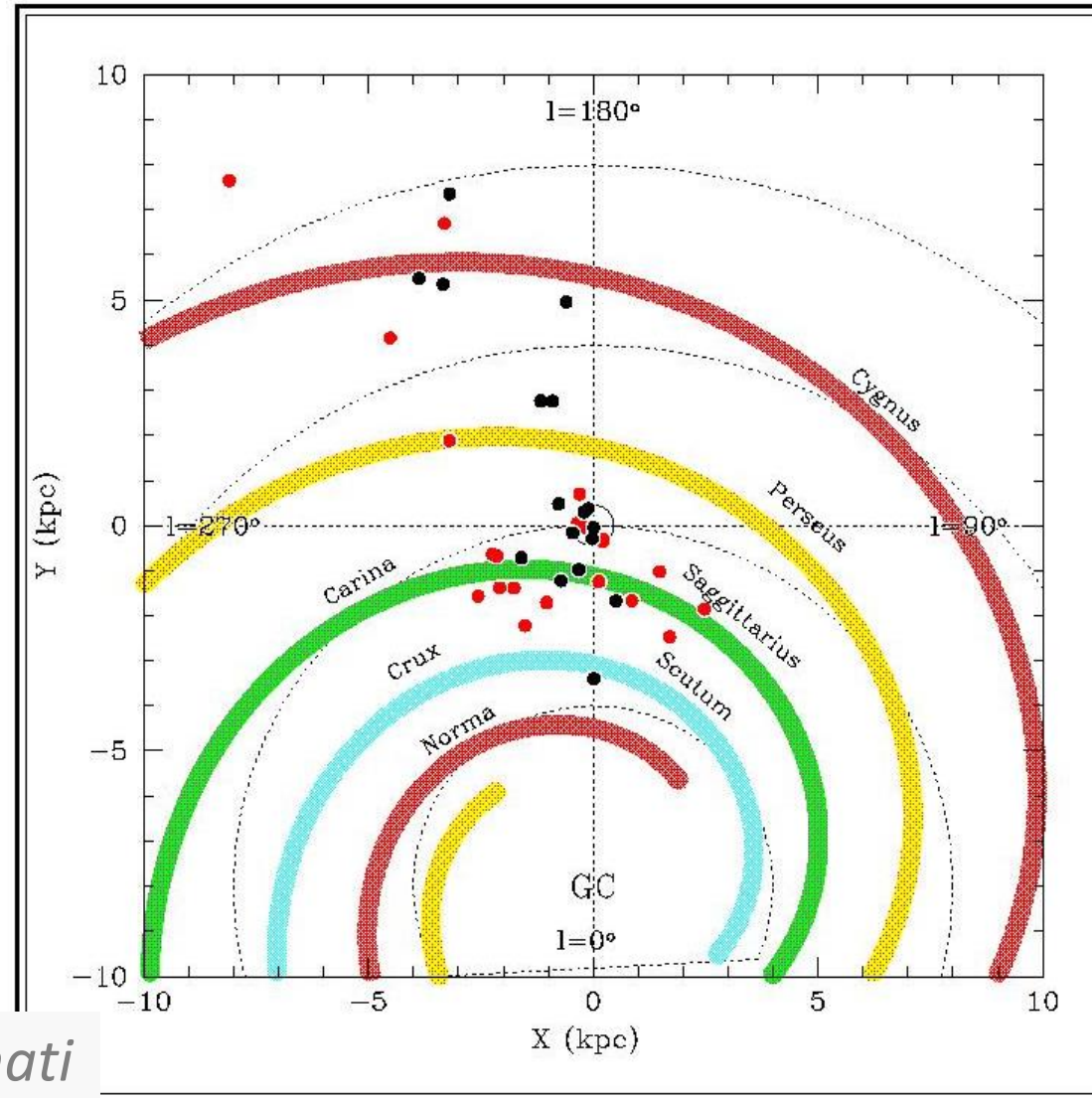


Observed
Protected

Observed cluster sample

Observed
Protected

z sampling to
be improved



Courtesy L. Magrini & P. Donati

How are we doing – observing strategy

All stellar-types (O-M dwarfs;MS-evolved giants) ✓

Unbiased for Giraffe ✓ → only 20 – 40 % confirmed as members

High prob. members for UVES : ok for old clusters (90% members), too few members (20-50 %) for young clusters

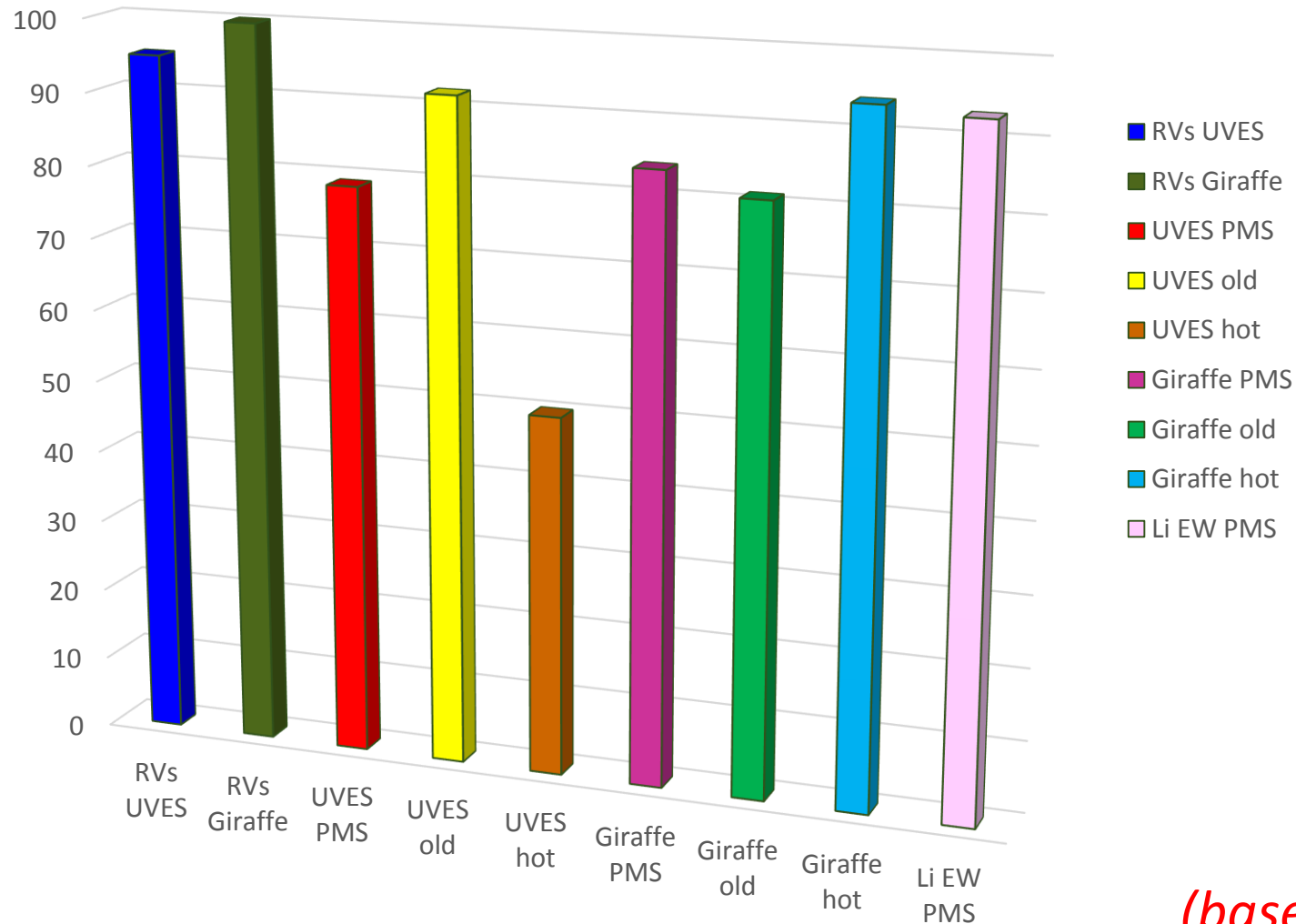
Uniform across clusters ✓

Sample also external cluster regions ✓

High level of contamination: novel science results confirm that this is an excellent strategy. But we should scientifically exploit the contaminants!

How are we doing – RVs and parameters

% of stars with parameter determined (independent of accuracy)



- Excellent fraction of stars with parameter determination (including $\log g$ from HR15N!)
- RV accuracy close to the original goals
- APs and abundance accuracies and precisions to be improved

(based on iDR2+iDR3)

How are we doing – science

The Gaia-ESO Survey: Abundance ratios in the inner-disk open clusters Trumpler 20, NGC 4815, NGC 6705*

L. Magrini¹, S. Randich¹, D. Romano², E. Friel³, A. Bragaglia², R. Smiljanic^{4,5}, H. Jacobson⁶, A. Vallenari⁷, M. Tosi⁸, L. Spina^{1,8}, P. Donati^{2,9}, E. Maiorca^{14,15}, F. Jiménez-Esteban¹⁶, D. Geisler¹⁷, N. Mowlavi¹⁸, C. Munoz¹⁷, I. San Roman¹⁷, C. Soubiran¹⁵, S. Villanova¹⁷, S. Zaggia¹, G. Gilmore¹¹, M. Asplund¹⁹, S. Feltzing²⁰, R. Jeffries²², T. Bensby²⁰, P. Francois²¹, S. Koposov^{11,23}, A. J. Korn²⁰, E. Flaccomio¹², E. Pancino^{2,24}, A. Recio-Blanco²⁵, G. Sacco²⁶, E. Franciosini¹, P. Jofre¹¹, P. de Laverny²⁵, V. Hill²⁵, U. Heiter²⁷, A. Hourihane¹¹, R. Jackson²², L. Morbidelli¹, J. Lewis¹¹, K. Lind¹¹, T. Masseron¹¹, L. Prisinzano¹², C. Worley¹¹

The Gaia-ESO Survey: the most metal-poor stars in the Galactic bulge

L. M. Howes^{1*}, M. Asplund¹, A. R. Casey², S. C. Keller¹, D. Yong¹, G. Gilmore¹, K. Lind^{2,3}, C. Worley², M. S. Bessell¹, L. Casagrande¹, A. F. Marino¹, D. M. Nataf¹, C. I. Owen¹, G. S. Da Costa¹, B. P. Schmidt¹, P. Tisserand¹, S. Randich², A. Vallenari⁶, C. Allende Prieto^{7,8}, T. Bensby⁵, E. Flaccomio⁹, A. Recio-Blanco¹², R. Smiljanic¹³, M. Bergemann², M. T. Costado⁷, U. Heiter³, V. Hill¹², A. Hourihane², P. Jofre², E. Maiorca⁴, T. Masseron², L. Morbidelli¹

The Gaia-ESO Survey: Kinematic structure in the Gamma Velorum cluster*

R. D. Jeffries¹, R. J. Jackson¹, M. S. Bessell², G. G. Sacco⁶, E. Bragaglia³, S. Feltzing⁹, G. Micela¹⁰, E. Allende Prieto¹¹, L. Magrini⁶, L. Morbidelli¹

The Gaia-ESO Survey: CNO abundances in the open clusters Trumpler 20, NGC 4815, and NGC 6705*

G. Tautvaišienė¹, A. Drazdauskas¹, Š. Mikolaitis^{1,2}, G. Barisevičius¹, E. Puzeras¹, E. Stonkutė¹, Y. Chorniy¹, L. Magrini³, D. Romano⁴, R. Smiljanic^{5,6}, A. Bragaglia⁴, G. Carraro⁷, E. Friel⁸, T. Morel⁹, E. Pancino^{4,10}, P. Donati⁴, F. Jiménez-Esteban¹¹, G. Gilmore¹², S. Randich³, R. D. Jeffries¹³, A. Vallenari¹⁴, T. Bensby¹⁵, E. Flaccomio¹⁶, A. Recio-Blanco², M. T. Costado¹⁷, V. Hill¹², P. Jofre¹², C. Lardo⁴, P. de Laverny², T. Masseron¹², L. Morbidelli³, S. G. Sousa¹⁸, S. Zaggia⁴

The Gaia-ESO Survey: the chemical composition from the first inter-discs

Š. Mikolaitis^{1,2}, V. Hill¹, A. Recio-Blanco¹, P. de Laverny², D. Romano¹⁰, G. Gilmore³, S. Randich⁴, S. Feltzing⁵, A. Bragaglia¹⁰, E. Flaccomio⁹, A. C. Lanzafame¹¹, F. M. T. Costado⁸, F. Damiani⁶, A. Hourihane³, P. L. Sbordone¹⁶, S. G. S. Zaggia⁴

The Gaia-ESO Survey*: Stellar content and elemental abundances in the massive cluster NGC 6705

A. Recio-Blanco¹, P. de Laverny¹, G. Kordopatis², A. Helmi³, V. Hill¹, G. Gilmore², R. Wyse⁴, V. Adibekyan⁵, S. Randich⁶, M. Asplund⁷, S. Feltzing⁸, R. Jeffries⁹, G. Micela¹⁰, A. Vallenari¹¹, E. Alfaro¹², C. Allende Prieto¹³, T. Bensby¹⁴, A. Bragaglia¹⁴, E. Flaccomio¹⁰, S. E. Koposov^{2,20}, A. Korn¹⁵, A. Lanzafame¹⁶, G. Sacco¹⁷, R. Smiljanic^{18,19}, R. Jackson⁹, J. Lewis², L. Magrini⁶, L. Morbidelli¹, L. Prisinzano¹⁰, G. Sacco⁶, C. C. Worley², A. Hourihane², M. Bergemann², M. T. Costado¹², U. Heiter¹⁵, P. Jofre², C. Lardo¹⁴, K. Lind², and E. Maiorca⁶

Gaia-ESO Survey: Empirical classification of VLT/Giraffe spectra in the wavelength range 6440–6810 Å in the γ Velorum cluster, and calibration of spectral indices***

F. Damiani¹, L. Prisinzano¹, G. Micela¹, S. Randich², G. Gilmore³, J. E. Drew⁴, R. D. Jeffries⁵, Y. Frémat⁶, E. J. Alfaro⁷, T. Bensby⁸, A. Bragaglia⁹, E. Flaccomio¹⁰, A. C. Lanzafame¹⁰, E. Pancino^{9,11}, A. Recio-Blanco¹², G. G. Sacco², R. Smiljanic^{13,14}, R. J. Jackson⁵, P. de Laverny¹², L. Morbidelli², M. T. Costado⁷, P. Jofre³, K. Lind³, and M. T. Costado⁷, P. Jofre³, K. Lind³, and M. T. Costado⁷

The Gaia-ESO Survey: radial metallicity gradients and age-metallicity relation of stars in the Milky Way disk*

M. Bergemann¹, G. R. Ruchti², A. Serenelli³, S. Feltzing², A. Alves-Brito^{4,23}, M. Asplund⁴, T. Bensby², P. Gruitters⁵, U. Heiter⁵, A. Hourihane¹, A. Korn⁵, K. Lind¹, A. Marino⁴, P. Jofre¹, T. Nordlander⁵, N. Ryde², C. C. Worley¹, G. Gilmore¹, S. Randich⁹, A. M. N. Ferguson¹⁰, R. D. Jeffries¹¹, G. Micela¹², I. Negueruela¹³, T. Prusti¹⁴, H-W. Rix¹⁵, A. Vallenari¹⁶, E. J. Alfaro²¹, C. Allende Prieto⁷, A. Bragaglia¹⁶, S. E. Koposov^{1,8}, E. Pancino^{17,9}, A. Recio-Blanco¹², R. Smiljanic^{19,20}, N. Walton¹, M. T. Costado²¹, E. Franciosini⁶, V. Hill¹⁸, C. Lardo¹⁷, P. de Laverny², G. Sacco⁶, G. Kordopatis²

The Gaia-ESO Survey: metallicity of the Chamaeleon I star formation region*

L. Spina¹, S. Randich¹, F. Palla¹, K. Biazzo², G. G. Sacco¹, E. J. Alfaro³, E. Franciosini¹, L. Magrini¹, L. Morbidelli¹, A. Frasca², V. Adibekyan⁴, E. Delgado-Mena⁴, S. G. Sousa^{4,5}, J. I. González Hernández^{6,7}, D. Montes⁸, H. Tabernero⁸, G. Tautvaišienė⁹, R. Bonito¹⁰, A. C. Lanzafame¹¹, G. Gilmore¹², R. D. Jeffries¹³, A. Vallenari¹⁴, T. Bensby¹⁵, A. Bragaglia¹⁶, E. Flaccomio¹⁰, A. J. Korn¹⁷, E. Pancino^{16,18}, A. Recio-Blanco¹⁹, R. Smiljanic²⁰, M. Bergemann¹², M. T. Costado³, F. Damiani¹⁰, V. Hill¹⁹, A. Hourihane¹², P. Jofre¹², P. de Laverny¹⁹, C. Lardo¹⁶, T. Masseron¹², L. Prisinzano¹⁰, C. C. Worley¹²

Top level science goals addressed + many unanticipated results

Concluding remarks

- Gaia-ESO is nominally half-way, but 20 % time lost
- We are on track, although several aspects can/should be improved (e.g., accuracy of APs/abundances, calibrations, timescales,..)
- iDR4 (spectra until July 2014) is starting → products in the Spring
- ESO is so far happy with us
- Excellent science! **Looking forward to many more results during this meeting and in the next months!**
-and looking forward to feedback on any aspects