IVANNA ESCALA

Assistant Professor ⋄ Institute of Astrophysics, Pontificia Universidad Católica de Chile
ivanna.escala@uc.cl ⋄ ivaescala.github.io

EDUCATION

California Institute of Technology (Caltech) Sep 2015 - Jun 2020
Ph.D., M.S. in Astrophysics

University of California, San Diego (UCSD) Sep 2011 - Jun 2015
B.S. in Physics with Specialization in Astrophysics (Magna Cum Laude)

RESEARCH & WORK EXPERIENCE

Assistant Professor July 2026 - Present
Institute of Astrophysics, Pontificia Universidad Católica de Chile (IA-PUC)

Postdoctoral Fellow Sep 2024 - June 2026
Space Telescope Science Institute (STScI)

Carnegie-Princeton Postdoctoral Fellow Aug 2022 - Jul 2024
Princeton University

Carnegie-Princeton Postdoctoral Fellow Aug 2020 - Jul 2022
Carnegie Observatories

Postdoctoral Researcher, Caltech Astronomy Jul 2020
with E. N. Kirby (Caltech)

Graduate Student Researcher, Caltech Astronomy Sep 2015 - Jun 2020
with E. N. Kirby (Caltech), K. M. Gilbert (STScI),
A. Wetzel (UC Davis), and P. F. Hopkins (Caltech)

Visiting Student Research Collaborator, Princeton Astrophysics Feb 2019 - Jan 2020
with J. Greene (Princeton)

Graduate Teaching Assistant, Caltech Astronomy Sep 2016 - Jun 2017

- Ay 123: Stellar Structure & Evolution *(with L. Hillenbrand)*
- Ay 21: Galaxies & Cosmology *(with G. Djorgovski)*
- Ay 126: Interstellar & Intergalactic Media *(with S. Kulkarni)*

Undergraduate Student Researcher, UCSD Physics Jun 2014 - Aug 2015
with A. J. Burgasser (UCSD) and D. Kereš (UCSD)

Academic Student Employee, UCSD Physics & Mathematics Sep 2013 - Jun 2014

SELECTED HONORS & AWARDS

Carnegie-Princeton Fellowship — Feb 2020
Carnegie Observatories & Princeton University

France A. Córdova Tombrello Scholar — Jun 2019
California Institute of Technology

Caltech Leadership Award — Jun 2017
California Institute of Technology

Women Mentoring Women Candace Rypisi Outstanding Mentor — Jun 2017
California Institute of Technology

National Science Foundation Graduate Research Fellowship — Apr 2017

Ford Foundation Predoctoral Fellowship — Apr 2017

National Science Foundation Graduate Research Fellowship, Honorable Mention — Apr 2016

Phi Beta Kappa New Initiate Scholarship — Jun 2015
University of California, San Diego

Phi Beta Kappa — Jun 2015
University of California, San Diego

Physical Sciences Dean's Undergraduate Award for Excellence — May 2015
University of California, San Diego

California Alliance for Minority Participation (CAMP)
Statewide Symposium Special Merit in Science & Engineering Award — Feb 2015
Irvine, CA, USA

SELECTED INVITED COLLOQUIA & SEMINARS

Center for Theory & Computation (CTC) Seminar
University of Maryland — Feb 2026

Pontficia Universidad Católica de Chile Colloquium — Sep 2025

Yale Data Science x Astrophysics Seminar — Nov 2024

Institut de Ciències del Cosmos Seminar
Universitat de Barcelona — Jan 2024

Konigstuhl Colloquium
Max Planck Institute for Astronomy — Apr 2023

Columbia Astrophysics Seminar — Feb 2023

Rutgers Astrophysics Seminar — Oct 2022

Carnegie Observatories Colloquium — June 2022

Joint UCSD-SDSU Astronomy Seminar — May 2022

Notre Dame Astrophysics Seminar — Apr 2022

University of Pennsylvania Astrophysics Seminar — Feb 2022

The Ohio State University CCAPP Seminar — Nov 2019

SELECTED CONFERENCE PRESENTATIONS

IAU 403: The Hidden Beauty of Galactic Outskirts (contributed talk) — Oct 2025
Córdoba, Spain

XMC II. Clouds over Yellowstone (contributed talk) — May 2025
Bozeman, Montana

The Milky Way Assembly Tale (contributed talk) — May 2024
Bologna, Italy

The Milky Way Is Not an Island (contributed talk) — Jan 2024
Sesto, Italy

Metal Production & Distribution in a Hierarchical Universe II (contributed talk) — Nov 2023
Santiago, Chile

Early Disk Galaxy Formation from JWST to the Milky Way (contributed talk) — Feb 2023
Kuala Lumpur, Malaysia

Linking the Galactic and the Extragalactic (contributed talk) — Dec 2022
Wollongong, Australia

Testing Hierarchical Assembly with Roman
240$^{\text{th}}$ Meeting of the American Astronomical Society (invited) — Jun 2022
Pasadena, CA

Press Conference Briefing
240$^{\text{th}}$ Meeting of the American Astronomical Society — Jun 2022
Pasadena, CA

STScI Symposium. The Local Group: Assembly and Evolution (contributed talk) — Sep 2020
Baltimore, MD, USA (virtual)

Stellar Archaeology & the First Stars, Kavli IPMU (contributed talk) — Dec 2018
Tokyo, Japan

Large Surveys of the Great Andromeda Galaxy (contributed talk) — Jul 2017
Leiden, the Netherlands

APPROVED PROGRAMS

co-I Roman Cycle 1 GAS (significant contributor)
Large program, 310.7 hrs awarded

"A Roman Legacy Survey of M31 and M33", PI Gilbert; Escala simulations WG lead

PI JWST/NIRSpec MOS, NIRCam
Small program, 25.0 hrs awarded (6.9 hr NIRCam parallels)

"How Extreme is Pegasus W? Testing Galaxy Evolution at the Lowest Stellar Masses", Cycle 4 GO 7196

PI Magellan/IFUM
2 nights awarded & experience observing: integral field spectroscopy

"Surveying Satellite Populations Beyond the Local Group: Spatially Resolved Chemical Abundances in M104 Dwarf Galaxies", 2023A

PI Magellan/IMACS
12.5 nights awarded & experience observing: multi-object spectroscopy

"NGC 3109: Stellar Halo Formation on the Scales of Low-Mass Galaxies", 2023A
"Chemical Abundances as a Probe of Hierarchical Galaxy Formation on Small Scales", 2020B, 2021B, 2022B

co-I Keck/DEIMOS (significant contributor)
2 nights awarded: multi-object spectroscopy
>20 nights total experience observing as co-I (2016B – Present)

"M31: The Milky Way's Foil for Studying Hierarchical Galaxy Formation"
PI Kirby, co-I Escala, ID: 2020B_C237

co-I Subaru/HSC (significant contributor)
Approx. 6 hr awarded (queue observing)

"A Holistic View of Andromeda's Assembly History: in support of Subaru/PFS, Keck/DEIMOS, and Subaru/HSC"
PI Kirby, co-I Escala, ID: 2019B_C219 (Subaru/Keck exchange)

PROFESSIONAL SERVICE

Space Telescope Science Institute Summer Colloquium Series (HotSci) Co-Organizer	2025
James Webb Space Telescope Telescope Allocation Committee *Panel Support Scientist*	Cycle 4 *2024–2025*
Session Chair, Galactic Frontiers: Dwarf Galaxies in the Local Volume and Beyond	Jul 2023
NSF NOIRLab Telescope Allocation Committee Member	Semester 2022A, 22B, 23A, 23B
Monthly Notices of the Royal Astronomical Society – Referee	2021 – Present
AAS Journals – Referee	2022 – Present
AAS Representative, Congressional Day Visit	Mar 2019

LEADERSHIP & MENTORSHIP EXPERIENCE

Postdoctoral Representative to the Executive Committee of STScI	2025 – 2026
Princeton Astrophysics Mentorship Program Co-Organizer	2023
Carnegie Astrophysics Summer Student Internship Program – Mentor / Volunteer	2022, 2021
UC Santa Cruz Science Intership Program (SIP) Mentor	2022
Carnegie Postdoc Co-Representative	Nov 2021 – Jul 2022

Caltech Graduate Student Council – Associate Director	2018–2019
Caltech Women in Physics, Math, and Astronomy – Founding President	2016–2018
Caltech Astronomy Graduate Outreach Coordinator	2017–2018
Caltech Graduate Student Council – Secretary	2017–2018
Caltech Women Mentoring Women – Mentor	2018, 2017, 2016
Caltech Summer Research Connection Program – Mentor	2017, 2016
UCSD Undergraduate Women in Physics – Board Member	2015, 2014

SELECTED OUTREACH ACTIVITIES

NASA Universe of Learning (speaker)	Aug 2025
Science Internship Program 2022 Plenary Session (speaker) *Santa Cruz, CA, USA (virtual)*	Aug 2022
Astronomy on Tap, Trenton (speaker) *Trenton, NJ, USA*	Feb 2019
Caltech Astronomy Stargazing & Lecture Series (speaker) *Pasadena, CA, USA*	Jun 2017
Palomar Observatory Greenway Talk Series (speaker) *Palomar Mountain, CA, USA*	Jan 2017
Southern California Physics Graduate Admissions Bootcamp (guest speaker) *La Jolla, CA, USA*	Aug 2017, Aug 2016
Astronomy on Tap, Los Angeles (speaker) *Pasadena, CA, USA*	Dec 2016

PUBLICATIONS

ADS Publications List: `https://ui.adsabs.harvard.edu/public-libraries/RLaeE2rTTcaHoJglE3Lmlg`
ORCID: 0000-0002-9933-9551

First Author

1. "Scylla at APOGEE: The Impact of Starbursts on the Chemical Evolution of the Magellanic Clouds" **Escala, I.**, McQuinn, Kristen B.W., Hasselquist, Sten, Cohen, Roger E., Johnson, James W., Hayes, Christian R., Burhenne, Clare, Ji, Alexander P., Lindberg, Christina W., Yanchulova Merica-Jones, Petia, Choi, Yumi, Dolphin, Andrew E., Williams, Benjamin F., Murray, Claire E., ApJ, 2026, in press. arXiv:2603.25909

   Fitted galactic chemical evolution models to APOGEE chemical abundances in the LMC and SMC in a modern statistical framework, using constraints from Scylla CMD-based star formation histories, to systematically investigate the impact of starbursts on interacting pairs of low-mass galaxies.

2. "Kinematical Modeling of the Resolved Stellar Outskirts of M32: Constraints on Tidal Stripping Scenarios"
   Escala, I., Grion Filho, D., Gilbert, K. M., Guhathakurta, P., Cullinane, L., Fardal, M., Tollerud, E., Chen, Z., Hyver, M., Williams, B. F., AJ, 2025, 991, 31

   Applied a novel methodology to model the kinematics of the resolved stellar outskirts of the rare compact elliptical satellite galaxy, M32, to show that it likely formed in a tidal stripping scenario.

3. "Resolved SPLASH Chemodynamics in Andromeda's PHAT Stellar Halo and Disk: On the Nature of the Inner Halo Along the Major Axis"
   Escala, I., Quirk, A. C. N., Guhathakurta, P., Gilbert, K. M., Wojno, J. L., Cullinane, L., Williams, B. F., Dalcanton, J., 2023, AJ, 165, 75

   Combined spectra from the SPLASH survey and photomtery from the PHAT survey to perform the first large-scaled chemodynamical analysis of M31's disk region (4–20 projected kpc). Found direct evidence for kicked-up disk stars in M31's halo and a single thickened disk structure.

4. "Kinematics and Metallicity of Red Giant Branch Stars in the Northeast Shelf of M31"
   Escala, I., Gilbert, K. M., Fardal, M., Guhathakurta, P., Sanderson, R. E., Kalirai, J. S., Mobasher, B., 2022, AJ, 164, 19.

   Performed first chemodynamical analysis of M31's NE shelf, a prominent tidal shell. Conclusively demonstrated that M31's major system of tidal features has a common origin in a single massive merger that also produced its Giant Stellar Stream.

5. "Elemental Abundances in M31: Gradients in the Giant Stellar Stream"
   Escala, I., Gilbert, K. M., Wojno, J., Kirby, E. N., Guhathakurta, P., 2021, AJ, 162, 45

   Analyzed data from the Elemental Abundances in M31 survey in the Giant Stellar Stream to measure a metallicity gradient, arguing that its chemical abundance patterns may favor an $L_\star$ progenitor.

6. "Elemental Abundances in M31: Properties of the Inner Stellar Halo"
   Escala, I., Kirby, E. N., Gilbert, K. M., Wojno, J., Cunningham, E. C., Guhathakurta, P., 2020, ApJ, 902, 51

   Measured abundances for about 200 stars in M31's halo (far from the disk, <35 projected kpc). Found evidence for a negative metallicity gradient, suggesting distinct halo formation mechanisms. Demonstrated that M31's halo formed from progenitors with high star formation efficiency.

7. "Elemental Abundances in M31: A Comparative Analysis of Alpha and Iron Abundances in the Outer Disk, Giant Stellar Stream, and Inner Halo"
   Escala, I., Gilbert, K. M, Kirby, E. N., Wojno, J., Cunningham, E. C., Guhathakurta, P., 2020, ApJ, 889, 177

   Measured the first chemical abundances in M31's inner halo and M31's outer disk. Showed that M31's halo could not have formed from progenitors similar to its dwarf satellite galaxies, and that its disk abundances could potentially support a recent merger-driven global starburst.

8. "Elemental Abundances in M31: Alpha and Iron Element Abundances from Low-Resolution Resolved Stellar Spectroscopy in the Stellar Halo"
   Escala, I., Kirby, E. N., Gilbert, K. M., Cunningham, E. C., Wojno, J., 2019, ApJ, 878, 42

   Developed and tested a Python-based spectral synthesis pipeline to measure chemical abundances from low-to-moderate resolution stellar spectra of individual red giant branch stars in M31.

9. "Modeling chemical abundance distributions for dwarf galaxies in the Local Group: the impact of turbulent metal diffusion"

Escala, I., Wetzel, A., Kirby, E. N., Hopkins, P. F., Ma, X., Wheeler, C., Kereš, D., Faucher-Giguère, C.-A., Quataert, E., 2018, MNRAS, 474, 2194

Investigated the simulated chemical abundance distributions of dwarf galaxies in the FIRE simulations, showing that a subgrid prescription for metal mixing produces more realistic results.

Second or Third Author

1. "Implications for a High Mass M31: M33's Orbital History and M31's Response to the Passage of M33"
   Patel, E., Garavito-Camargo, N., **Escala, I.**, ApJ, 2025, ApJ, 985, 121

2. "IFUM Integrated Field Spectroscopy of Ten M104 Satellite Galaxy Candidates"
   Crosby, E., Mateo, M., **Escala, I.**, Jergen, H., Muller, O., Pawlowski, M. S., MNRAS, 2025, 536, 2072

3. "Elemental Abundances in And XIX From Coadded Spectra"
   Cullinane, L. R., Gilbert, K M., **Escala, I.**, Wojno, J. L., Kirby, E. N., Kvasova, K. A., Tollerud, E., Collins, M. L. M., Rich, R. M., ApJ, 2024, 972, 133

4. "Elemental Abundances in M31: First Alpha and Iron Abundance Measurements in M31's Giant Stellar Stream"
   Gilbert, K. M., Kirby, E. N., **Escala, I.**, Wojno, J., Kalirai, J. S., Guhathakurta, P., 2019, ApJ, 883, 128

5. "Elemental Abundances in M31: The Kinematics and Chemical Evolution of Dwarf Spheroidal Satellite Galaxies"
   Kirby, E. N., Gilbert, K. M., **Escala, I.**, Wojno, J., Guhathakurta, P., 2020, ApJ, 159, 46

Co-Author

1. "A Chemodynamical Census of the Milky Way's Ultra-Faint Compact Satellites. I. A First Population-Level Look at the Internal Kinematics and Metallicities of 19 Extremely-Low-Mass Halo Stellar Systems"
   Cerny, W., Li, T. S., Pace, A. B., Simon, J. D., Geha, M., Ji, A. P., Drlica-Wagner, A., Bruce, J., Gnedin, O. Y., Bell, E. F., Mau, S., **Escala, I.**, Bissonette, D., Savino, A., Chiti, A., Kirby, E. N., ApJ, submitted. arXiv: 2602.17652

2. "The structure of the stellar halo of the Andromeda galaxy explored with the NB515 for Subaru/HSC. I.: New Insights on the stellar halo up to 120 kpc"
   Ogami, I., Tanaka, M., Komiyama, Y., Chiba, M., Guhathakurta, P., Kirby, E. N., Wyse, R. F. G., Filion, C., Gilbert, K. M., **Escala, I.**, Mori, M., Kirihara, T., Tanaka, M., Ishigaki, M. N., Hayashi, K., Lee, M. G., Sharma, S., Kalirai, J. S., Lupton, R. H., MNRAS, 2025, 536, 530

3. "Eridanus III and DELVE 1: Carbon-rich Primordial Star Clusters or the Smallest Dwarf Galaxies?"
   Simon, J. D., Li, T.S., Ji, A. P., Pace, A, B., Hansen, T. T., Cerny, W., **Escala, I.**, Koposov, S. E., Drlica-Wagner, A., Mau, S., Kirby, E. N., ApJ, 2024, 976, 256

4. "Chemical Cartography of the Sagittarius Stream with Gaia"
   Cunningham, E. C., Hunt, J. A. S., Price-Whelan, A. M., Johnston, K. V., Ness, M. K., Lu, Y., **Escala, I.**, Stelea, I. A, ApJ, 2024, 963, 95

5. "TREX: Kinematic Characterisation of a High-Dispersion Intermediate-Age Stellar Component in M33"

Cullinane, L. R., Gilbert, K. M., Guhathakurta, P., Quirk, A. C. N., **Escala, I.**, Smercina, A., Williams, B. F., Tollerud, E., Qu, J., McConnel, K., 2023, ApJ, 958, 157

6. "HALO7D III: Chemical Abundances of Milky Way Halo Stars from Medium Resolution Spectra"
McKinnon, K. A., Cunningham, E. C., Rockosi, C. M., Guhathakurta, P., **Escala, I.**, Kirby, E. N., Deason, A. J., ApJ, 2023, 951, 43

7. "Elemental Abundances in M31: Individual and Coadded Spectroscopic [Fe/H] and [α/Fe] throughout the M31 Halo with SPLASH"
Wojno, J. L., Gilbert, K. M., Kirby, E. N., **Escala, I.**, Guhathakurta, P., Beaton, R. L., Kalirai, J., Chiba, M., Majewski, S. R., ApJ, 2023, 951, 12

8. "Spiral Arms are Metal Freeways: Azimuthal Gas-Phase Metallicity Variations in Simulated Cosmological Zoom-in Flocculent Disks"
Orr, M. E., Burkhart, B., Wetzel, A., Hopkins, P. F., **Escala, I. A.**, Strom, A. L., Goldsmith, P. F., Pineda, J. L., Hayward, C. C., Loebman, S. R., MNRAS, 2023, 521, 3708

9. "Reading the CARDS: the Imprint of Accretion History in the Chemical Abundances of the Milky Way's Stellar Halo"
Cunningham, E. C., Sanderson, R. E., Johnston, K. V., Panithanpaisal, N., Ness, M. K., Wetzel, A., Loebman, S. R., **Escala, I.**, Horta, D., Faucher-Giguère, C.-A., 2022, ApJ, 934, 172

10. "Gas infall and radial transport in cosmological simulations of Milky Way-mass disks"
Trapp, C., Kereš, D., Chan, T. K., **Escala, I.**, Hummels, C., Hopkins P. F., Faucher-Giguère, C.-A., Murray, N., Quataert, E., Wetzel, A., MNRAS, 2022, 509, 4149

11. "Elemental Abundances in M31: Iron and Alpha Element Abundances in M31's Outer Halo"
Gilbert, K. M., Wojno, J., Kirby, E. N., **Escala, I.**, Beaton, R., Guhathakurta, P., Majewski, S., 2020, ApJ, 160, 41

12. "Elemental Abundances in M31: [Fe/H] and [alpha/Fe] in M31 Dwarf Galaxies Using Coadded Spectra"
Wojno, J., Gilbert, K. M., Kirby, E. N., **Escala, I.**, Beaton, R., Tollerud, E., Majewski, S., Guhathakurta, P., 2020, ApJ, 895, 78

13. "Reconciling Observed and Simulated Stellar Halo Masses"
Sanderson, R. E., Garrison-Kimmel, S., Wetzel, A., Chan, T. K., Hopkins, P. F., Kereš, D., **Escala, I.**, Faucher-Giguère, C.-A., Ma, X., 2018, ApJ, 869, 12

14. "FIRE-2 simulations: physics versus numerics in galaxy formation"
Hopkins, P. F., Wetzel, A., Kereš, D., Faucher-Giguère, C.-A., Quataert, E., Boylan-Kolchin, M., Murray, N., Hayward, C. C., Garrison-Kimmel, S., Hummels, C., Feldmann, R., Torrey, P., Ma, X., Anglés-Alcázar, D., Su, K. Y., Orr, M., Schmitz, D., **Escala, I.**, Sanderson, R., Grudić, M., Hafen, Z., Kim, J. H., Fitts, A., Bullock, J. S., Wheeler, C., Chan, T. K., Elbert, O. D., Narayanan, D., 2018, MNRAS, 480, 800

15. "The First Brown Dwarf/Planetary-mass Object in the 32 Orionis Group"
Burgasser, A. J., Lopez, M. A., Mamajek, E. E., Gagné, J., Fahertry, J. K., Tallis, M., Choban, C., Tamiya, T., **Escala, I.**, Aganze, C., 2016, ApJ, 820, 32

16. "Auroral Radio Emission from Late L and T Dwarfs: A New Constraint on Dynamo Theory in the Substellar Regime"

Kao, M., Hallinan, G., Pineda, J. S., **Escala, I.**, Burgasser, A. J., Bourke, S., Stevenson, D., 2016, ApJ, 818, 2

17. "Characterization of the Very-low-mass Secondary in the GJ 660.1AB System"
Aganze, C., Burgasser, A. J., Faherty, J. K., Choban, C., **Escala, I.**, Lopez, M. A., Jin, Y., Tamiya, T., Tallis, M., Rockward, W., 2016, AJ, 151, 46

Conference Proceedings & White Papers

1. "Galactic Archaeology with the Subaru ʻŌnohiʻula Prime Focus Spectrograph Strategic Program"
Chiba, Masashi, Wyse, Rosemary F., Kirby, Evan N., et al. (incl. Escala, I.) 2026, arXiv:2604.09875

2. "Why the Northern Hemisphere Needs a 30-40 m Telescope and the Science at Stake: Resolved Stellar Populations Studies in M31 and its Satellites"
Gallart, C., Fernandez-Alvar, E., Queiroz, A.B.A., et al. (incl. Escala, I.) 2026, arXiv:2512.14788

3. "On the [α/Fe] bimodality of the M31 disks"
Nidever, D., Gilbert, K., Tollerud, E., Siders, C., **Escala, I.**, Allende Prieto, C., Smith, V., Cunha, K., Debattista, V., Ting, Y.-S., Kirby, E. 2023, arXiv:2306.04688

4. "Optimizing Roman's High Latitude Wide Area Survey for Low Surface Brightness Astronomy"
Montes, M. et al. (incl. Escala, I.) 2023, arXiv:2306.09414

5. "RomAndromeda: The Roman Survey of the Andromeda Halo"
Dey, A., Najita, J., Filion, C., Han, J. J., Pearson, S., Wyse, R., Thob, A. C. R. et al. (incl. Escala, I.) 2023, arXiv:2306.12302

6. "Construction of an $L_\star$ Galaxy: the Transformative Power of Wide Fields for Revealing the Past, Present and Future of the Great Andromeda System"
Gilbert, K., Tollerud, E., et al. (incl. Escala, I.) 2019, BAAS, 51, 540