

Valeria Olivares

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I am an early career researcher in observational astrophysics who uses multi-wavelength observations to study the life-cycle of gas and AGN feedback of central galaxies in clusters and groups.

RESEARCH EXPERIENCE AND EMPLOYMENT

2024 – present	NASA NPP fellow AMES RESEARCH CENTER · USA 📍
2020 – 2024	Postdoctoral Researcher UNIVERSITY OF KENTUCKY · USA 📍 Multi-wavelength studies of clusters of galaxies.
2017 – 2020	Ph.D. in Astronomy & Astrophysics OBSERVATOIRE DE PARIS · France 📍 Thesis: "Unveiling the origin of filamentary structures around central galaxies in groups and cluster". Supervisors: Philippe Salome & Francoise Combes
2014 – 2016	Master in Science, mention Physics UNIVERSIDAD DE CONCEPCION · Chile 📍 Thesis: "SINFONI observations of high-redshift submillimeter galaxies". Supervisor: Ezequiel Treister
2010 – 2014	Astronomy degree, First Class Honours UNIVERSIDAD DE CONCEPCION · Chile 📍
2010 – 2013	Bachelor in Astronomy, First Class Honours UNIVERSIDAD DE CONCEPCION · Chile 📍 with First Class Honours

PROFESSIONAL EXPERIENCE

Mentoring

2021 – Current	PhD co-supervisor, University of Kentucky, USA. "The formation channels of multiphase gas in nearby early-type galaxies using MUSE and <i>Chandra</i> observations"
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Observing

2022	IRAM 30m telescope, PolyFix, 3 days in remote mode.
2017	IRAM 30m telescope, PolyFix, 2 nights in remote mode.
2016	Australia Telescope National Facility, Australia Telescope Compact Array (ACTA), 12 nights (onsite).
2015	Atacama Pathfinder EXperiment (APEX) telescope, bolometer arrays (LABOCA), 10 days (onsite).

Granted Observing Proposals

2023	113.26H3/113-B/2023, VLT, MUSE, 7 hrs (PI) grade C
2023	094226/2023, XMM-Newton, 50.00ks (co-PI)
2023	25800027/2023, XMM-Newton, 200.00ks (co-PI)
2023	25800027/2023, Chandra, 200.00ks (co-PI)
2023	25800020/2021, Chandra, 125.00ks (co-PI)
2023	112.25KS.001/112-A/2023, VLT, MUSE, 5 hrs (PI)
2023	112.25JS.001/112-A/2023, VLT, MUSE, 6 hrs (PI)
2022	110.2405.001/110-A/2022, VLT, MUSE, 20 hrs (PI)
2022	084-22/winter/2022, IRAM30m, 24 hrs, grade B (co-PI)
2022	030-22/summer/2022, IRAM30m, 11.5 hrs, grade A (PI)
2022	2022.1.01488.S/cycle9/2022, ALMA, 10 hrs, grade A (PI)
2021	2021.1.01626.S/cycle8/2021, ALMA, ACA, 7 hrs, grade B (co-PI)
2021	2021.1.00776.S/cycle8/2021, ALMA+ACA, 23 hrs, grade B (PI)
2021	23800288/2021, Chandra, 115.00ks (co-PI)
2021	090162/2021, XMM-Newton 155ks (co-PI)
2020	088208/2020, XMM-Newton, 65ks (co-PI)
2020	S20BD/Summer/2020, IRAM 30m, PolyFiX, 25.6 hours (co-PI)
2019	2019.2.00122.S/cycle 7/2019, ALMA, ACA instrument, 22.5 hrs (co-PI)
2019	2019.1.01665.S/cycle 7/2019, ALMA, 23 hrs no observed (co-PI)
2019	193-19/Winter/2019, IRAM 30m, PolyFiX, 13 hrs (co-PI)
2019	065-19/Summer/2019, IRAM 30m, PolyFiX, 25 hrs (co-PI)
2019	0102.A-0442/102-A/2019, VLT, MUSE, 8 hrs. (co-PI)

Astronomical Techniques

Chandra	Imaging and spectra analysis using CIAO, PyXSPEC and Sherpa
ALMA	Calibration and analysis using various versions of CASA.
Disk modeling	Using ^{3D} Barolo.
NOEMA/IRAM	Calibration and analysis using various using Gildas (MAPPING and CLASS).
MUSE/SINFONI	Data reduction and analysis using various ESOREX, PpXF, Platefit, & ZAP.
JVLA	Data calibration of 3GHz (S-Band) continuum survey (1 pointing, 190 hrs of data), using the JVLA pipeline, CASA and Python.

Computer Skills

Languages	Python, IDL/GDL, Cluster computing, LATEX
Operating systems	GNU/Linux, MacOS

Journal referee

Referee of the Astrophysical Journal (ApJ)
Referee of the Astrophysical Journal letters
Referee of the Astronomy & Astrophysics (A&A) journal
Referee of ESO proposals
Referee of ALMA proposals
Referee of the IRAM conference proceedings of 2022

Memberships/Collaborations

Member of the American Astronomical Society
Member of the LYRICS collaboration
Member of the CLoGS collaboration
Member of the Antlia collaboration
2014 – 2016 Former member of Astronomical Outreach Team (E.D.A), Department of Astronomy, University of Concepcion

Workshop and Training

11/2023	Training – "ALMA Data Reduction Party: Data Combination" / NRAO, Charlottesville, VA Comments: This program is designed to obtain images for at least a subset of their dataset (PIs). It was limited to 10 participants.
01/2022 - 05/2022	Training – "Leadership and Management in Action Program" / University of Kentucky & and University of Washington, USA Comments: Program designed to guide postdocs through some of the challenges and concerns that mentees and mentors encounter in mentoring relationships
10/2021 - 11/2022	Training: "Postdoc Mentoring Training" / University of Kentucky, USA Comments: Program designed to guide postdocs through some of the challenges and concerns that mentees and mentors encounter in mentoring relationships
10/2018	Training: "10th IRAM millimeter interferometry school" / Grenoble, FR " Comments: Workshop to acquire a knowledge of interferometry and data reduction techniques at millimeter wavelengths, with a emphasis on the NOEMA interferometer and its new capabilities
02/2016 - 02/2017	Science visit: Leiden Observatory, NL Comment: Research collaboration to develop a pipeline to do the data reduction and calibration of ~200 hours of S-Band JVLA data (one pointing)
06/2016	Training: "15th Synthesis Imaging Workshop" / NRAO and New Mexico Institute of Mining and Technology, Socorro, US Comments: The workshop comprised of a week of lectures on aperture synthesis theory and techniques.
10/2016	Training – "NOVA fall School" / Netherlands Institute for Radio Astronomy (ASTRON), NL
09/2015	Training: "Third La Serena School of Data Science" / AURA Campus, Chile. Workshop focused on applied tools for handling big astronomical data. At the end of the workshop a short science project was done : Looking for supermassive black hole binaries in CRTS data.

Teaching

2015	Teaching Assistant for Software and Astronomical data Analysis Classes Universidad de Concepción The responsibilities include creating and teaching tutorials, grading assignments, and occasionally giving lectures.
2014	Teaching Assistant for Programming Classes Universidad de Concepción The responsibilities include creating and teaching tutorials, grading assignments, and occasionally giving lectures.
2013	Teaching Assistant for Stellar Astrophysics Classes Universidad de Concepción The responsibilities include creating and teaching tutorials, and occasionally giving lectures.

Outreach

2023	Speaker at the "It's Eclipse Time!": Astronomy talk to kids of underrepresented background at the Public Library Lexington, US
2023	Speaker at the "Festival de la Astronomia" University of Kentucky, US Talk to more than 100 school students of underrepresented background.
2023	Speaker at the "Full STEM Ahead: Solar Telescopes" Astronomy talk to kids of underrepresented background at the Public Library Lexington, US
2014 – 2016	Advisor at the "Astronomical School Congress" Universidad de Concepción (CONICYT Project) Role: Tutor for the participants from elementary and middle schools for 7 scholar projects every year.
2016	Tutor at the "Astronomical School for Professors" Universidad de Concepción (CONICYT project) Role: Lectures for professors from middle and high schools.
2014 – 2016	Various outreach activities and lectures with elementary and middle school students as part of the E.D.A outreach team

Scientific meeting organization

2020	LOC of CLEARNESS IAP 2020: The Circum galactic medium around galaxies: when baryons invest haloS (22-26 June 2020, IAP, Paris)
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AWARDS & GRANTS

2024 – 2025	NASA NPP fellowship
2022	NRAO Student Observing Support (SOS) Program fellowship for the PhD student I co-supervised (scientific PI)
2021 – 2024	NSF grant (co-PI) 278,074 USD Collaborative Research: A Systematic and Comprehensive Study of Black Hole-Driven Turbulence in Massive Galactic Systems, n. 2107711.
2020	IAU travel grant / 500 EUR, awarded to participate of the IAU Symposium 359
2017 – 2020	IEcole Doctorale Astronomie & Astrophysique d'Ile-de-France (ED 127) 52,9200 EUR, for doctoral studies, FR (Awarded one of 18 French fellowships)
2018	Ecole Doctorale de Paris travel funding / 500 EUR, for attending Interferometry School, FR
2016	Leids Kerkhoven-Bosscha Fonds (LKBF) (Netherlands) / 1,000 EUR, for attending 15th Synthesis Imaging Workshop, US
2016	"Premio Universidad de Concepcion" for Academic Excellence / Universidad de Concepcion
2014 – 2015	Fellowship for Master Studies / 15,000 USD, Universidad de Concepcion

CONTRIBUTED AND INVITED TALKS

- 09/2024** A AGN feedback and Star Formation Across Cosmic Scales and Time, Italy (Invited speaker, to come)
04/2024 HEAD 21 meeting, Texas, USA (Contributed talk, to come)
08/2023 A journey through galactic environments, Porto Ercole, Italy (Contributed talk)
05/2023 Midwest Magnetic Fields Workshop 2023 (Contributed talk, online)
04/2023 KAAS meeting, University of Kentucky (Contributed talk)
02/2023 Astronomy seminar, University of Michigan (Invited Seminar)
02/2023 IFPU workshop: on complex dynamical systems in astrophysics, Trieste, IT (Invited seminar talk)
01/2023 AAS241 meeting, Seattle, US (Contributed talk)
12/2022 Multi-phase, Multi-temperature and Complex: how AGN feedback shapes the nature of the circum-galactic and halo gas in galaxy groups (ESO Garching) (Contributed talk)
07/2022 NAM2022, UK (via zoom) (Invited talk)
06/2022 AAS240 meeting, Pasadena, US (Invited conference press talk)
06/2022 AAS240 meeting, Pasadena, US (Contributed talk)
06/2022 Multiphase AGN Feeding & Feedback II, Sesto, IT (Invited talk)
04/2022 LYRICS meeting, Paris, FR (Seminar talk)
04/2022 Multi-line Diagnostics of the Interstellar Medium, Nice, FR (Contributed talk)
03/2022 Large-Volume Spectroscopic Analysis and Star-forming galaxies in the Era of JWST workshop (Via zoom) (Poster talk)
01/2022 XVII SOCHIAS Meeting, Santiago, CL (via zoom) (Contributed talk)
11/2021 The 1st KIAA Forum on Gas in Galaxies for Early Career Scientists, China (via zoom) (Contributed talk)
11/2021 KAS 2021 Annual Meeting, Kentucky, USA (via zoom) (Contributed talk)
06/2021 Galaxy Cluster Formation II, ESO, Germany (via zoom) (Poster talk)
04/2021 Kentucky Area Astronomical Society (KAAS) meeting, USA (via zoom) (Contributed talk)
01/2021 Astronomy seminar, University of Kentucky, USA (via zoom) (Invited seminar)
09/2020 Galaxy Cluster group meeting, CfA, USA (via Zoom) (Invited seminar)
03/2020 Galaxy Journal Club, Institut d'Astrophysique de Paris (IAP), FR (Invited talk)
03/2020 IAU Symposium 359, Bento Gonçalves, BR (Contributed talk & poster presentation)
07/2019 Tracing Cosmic Evolution with Clusters of Galaxies, Sesto, IT (Contributed talk)
06/2019 EWASS 2019 symposium, Lyon, FR (Contributed talk)
10/2018 IRAM Interferometry School 2018, Grenoble, FR (Poster talk)
09/2018 48th YERAC Young European Radio Astronomers Conference, ASTRON, NL (Contributed talk)
05/2017 Paris Observatory, FR (Invited seminar)
10/2016 NOVA fall School for Astronomy, ASTRON, NL (Contributed talk)
10/2015 Lunch Talk, Leiden Observatory, NL (Invited seminar)
07/2015 Galaxy Evolution Group, Universidad de Concepción, CL (Invited talk)
03/2015 Unveiling the AGN/Galaxy Evolution Connection 2015, Puerto Varas, CL (Poster talk)

PRESS RELEASES

- 06/2022** "Black Hole Activity not Evolving in Central Cluster Galaxies" – Press conference at the AAS 240 meeting in California, US.)
[from University of Kentucky](#), [from News Wise](#), and [from Astrobites](#)

REFERENCES

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|-------------------------------|---|
| Prof. Yuanyuan Su | University of Kentucky / yuanyuan.su@uky.edu |
| Prof. Philippe Salome | Paris Observatoire / philippe.salome@obspm.fr |
| Prof. Françoise Combes | Paris Observatoire / francoise.combes@obspm.fr |
| Dr. Massimo Gaspari | Princeton University / astro.princeton.edu |
| Dr. Stephen Hamer | University of Bath / S.L.Hamer@bath.ac.uk |

PAPERS

18 accepted refereed publications + 1 under review + 2 in prep
Total of 349 citations, h-index=8 for refereed publications (ui.adsabs.harvard.edu)

- 2023•sub** "H α and X-ray Surface Brightness Correlation of Filaments in Cooling Flow Clusters."
Valeria Olivares, Adrien Picquenot, Yuanyuan Su, Marie-Lou Gendron-Marsolais, Fiorella L. Polles, Massimo Gaspari, Paul Nulsen, **Submitted to Nature Astronomy** <https://doi.org/10.21203/rs.3.rs-3117255/v1>
- 2023** "The formation channels of multiphase gas in nearby early-type galaxies."
Ryan Eskenasy, **Valeria Olivares**, Yuanyuan Su, Yuan Li, Accepted for publication in MNRAS
- 2023** "The composition and thermal properties of a cool core lacking a brightest cluster galaxy."
Y. Su, F. Combes, **V. Olivares**, G. Castagnani, P. Torne, R. Weeren, Accepted for publication in MNRAS
- 2023** "X-ray Cavity Dynamics and their Role in the Gas Precipitation in Planck Sunyaev–Zeldovich (SZ) Selected Clusters."
V. Olivares, Y. Su, W. Forman, M. Gaspari, F. Andrade-Santos, P. Salome, P. Nulsen, A. Edge, F. Combes, and C. Jones, 2023, Accepted for publication in ApJ <https://iopscience.iop.org/article/10.3847/1538-4357/ace359>
- 2023** "Waking the monster: the onset of AGN feedback in galaxy clusters hosting young central radio galaxies."
F. Ubertosi, M. Gitti, F. Brighenti, **V. Olivares**, E. O'Sullivan, and G. Schellenberge, 2023, A&A, 673A, 52U <https://doi.org/10.1051/0004-6361/202345894>
- 2023** "Turbulence Traced with Multiphase Filaments in the Centers of Galaxy Clusters."
Ganguly, Shalini; Li, Yuan, **Olivares, Valeria**; Su, Yuanyuan; Combes, Francoise; Prakash, Sampadaa; Hamer, Stephen; Guillard, Pierre; Ha, Trung, 2023, FrASS.1038613G <https://doi.org/10.3389/fspas.2023.1138613>
- 2022** "AGN feedback duty cycle in Planck SZ selected clusters using Chandra observations."
V. Olivares, Y. Su, P. Nulsen, R. Kraft, T. Somboonpanyakul, F. Andrade-Santos, C. Jones, W. Forman, 2022 MNRAS 516L 101O <https://doi:10.1093/mnrasl/slac096>
- 2022** "Merger histories of brightest group galaxies from MUSE stellar kinematics."
I. Loubser , P. Lagos , A. Babul , E. O'Sullivan , S. L. Jung, **V. Olivares**, and K. Kolokythas, 2022 MNRAS, 515 1104L <https://doi.org/10.1093/mnras/stac1781>
- 2022** "Spatially-resolved properties of early-type group-dominant galaxies: gas content, ionisation mechanisms and metallicity gradients."
Lagos, P.; Loubser, S. I.; Scott, T. C.; O'Sullivan, E.; Kolokythas, K.; Babul, A.; Nigoche-Netro, A.; **Olivares, V**; Sengupta, C, 2022, MNRAS 516 5487L <https://academic.oup.com/mnras/article/516/4/5487/6694265>
- 2022** "AGN jets do not prevent the suppression of conduction by the heat buoyancy instability in simulated galaxy clusters."
Beckmann, Ricarda S., Dubois, Yohan, Pellissier, Alisson, Polles, Fiorella L., **Olivares, Valeria**, 2022 A&A 666A 71B <https://doi:10.1051/0004-6361/202243873>
- 2022** "Cosmic rays and thermal instability in self-regulating cooling flows of massive galaxy clusters."
Ricarda S. Beckmann, Yohan Dubois, Alisson Pellissier-Michel, **Valeria Olivares**, Fiorella L. Polles, Pierre Guillard, and Matthew D. Lehnert, 2022 A&A 665A, 129B <https://doi:10.1051/0004-6361/202142527>
- 2022** "Gas condensation in brightest group galaxies unveiled with MUSE. Morphology and kinematics of the ionized gas."
V. Olivares, P. Salome, S. L. Hamer, F. Combes, P. Guillard, R. S. Beckmann, M. D. Lehnert, O'Sullivan, R. Canning, F. L. Polles, et al., A&A, 666, A94 <https://doi.org/10.1051/0004-6361/202142475>
- 2021** "Excitation mechanisms in the intracluster filaments around the Brightest Cluster Galaxies."
F. L. Polles, P. Salome, F. Combes, P. Guillard, G. Pineau des Forets, **V. Olivares**, R. S. Beckmann, M. D. Lehnert, S. L. Hamer, R. Canning, F. Combes , Y. Dubois, A. C. Edge, A. C. Fabian, G. J. Ferland, S. L. Hamer, and M. D. Lehnert, et al. 2021, A&A, 651A, 13P <https://doi:10.1051/0004-6361/202039730>
- 2019** "Dense gas formation and destruction in a simulated Perseus-like galaxy cluster with spin-driven black hole feedback."
R. S. Beckmann, Y. Dubois, P. Guillard, P. Salome, **V. Olivares**, F. Polles, C. Cadiou, F. Combes, S. Hamer, M. D. Lehnert, and G. Pineau des Forets. 2019, A&A, A60, 631 <http://doi.org/10.1051/0004-6361/201936188>
- 2019** "Ubiquitous cold and massive filaments in cool core clusters."
V. Olivares, P. Salome, F. Combes, S. Hamer, P. Guillard, M. D. Lehnert, F. Polles, R. S. Beckmann, Y. Dubois, M. Donahue, A. Edge, A. C. Fabian, B. McNamara, T. Rose, H. Russell, G. Tremblay, A. Vantyghem, R. E. A. Canning, G. Ferland, B. Godard, M. Hogan, S. Peirani, G. Pineau des Forets. 2019, A&A, A22, 631 <http://doi.org/10.1051/0004-6361/201935350>

- 2019** "Driving massive molecular gas flows in central cluster galaxies with AGN feedback."
H. R. Russell, B. R. McNamara, A. C. Fabian, P. E. J. Nulsen, F. Combes, A. C. Edge, M. Madar, **V. Olivares**, P. Salome, A. N. Vantyghem. 2019, MNRAS, 490, 3025R <http://10.1093/mnras/stz2719>
- 2019** "Discovery of a diffuse optical line emitting halo in the core of the Centaurus cluster of galaxies: Line emission outside the protection of the filaments."
S. L. Hamer, A. C. Fabian, H. R. Russell, P. Salome, F. Combes, **V. Olivares**, F. L. Polles, A. C. Edge, R. S. Beckmann. 2019, MNRAS, 483 <http://doi.org/10.1093/mnras/sty3459>
- 2018** "Cold gas in a complete sample of group-dominant early-type galaxies?"
E. OSullivan, F. Combes, P. Salomé, L. P. David, A. Babul, J. M. Vrtilek, **V. Olivares**, S. Raychaudhury, G. Schellenberger. 2018, A&A, A126, 618 <http://doi.org/10.1051/0004-6361/201833580>
- 2016** "Spatially Resolved Spectroscopy of Sub-mm Galaxies at $z \simeq 2$ "
V. Olivares, E. Treister, G. Privon, S. Alaghband-Zadeh, C. Casey, S. Chapman, K. Schawinski, A. M. Swinbank, I. Smail, E. Gawiser, P. Kurczynski, N. Nagar, F. Bauer. 2016, ApJ, 827,570 <http://doi.org/10.3847/0004-637X/827/1/57>

CONFERENCE PROCEEDINGS

- 2022** "Gas condensation in Brightest Group Galaxies unveiled with MUSE"
V. Olivares, 2022, Multi-line Diagnostics of the Interstellar Medium, Nice, France, Edited by Bouscasse, L.; Kramer, C.; Gueth, F.; EPJ Web of Conferences, Volume 265, id.00015
<https://10.1051/epjconf/202226500015>
- 2021** "Ubiquitous cold and massive filaments in brightest cluster galaxies"
V. Olivares, P. Salome, 2021, Galaxy Evolution and Feedback across Different Environments. Proceedings of the International Astronomical Union, Volume 359, pp. 182-184
<https://10.1017/S1743921320002355>