

# Gabriela Calistro Rivera

ESO Postdoctoral Fellow

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## Research Interests

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- The role of molecular gas in galaxy evolution.
- Multi-wavelength spectral energy distributions of galaxies and AGN
- The co-evolution of galaxies and black-holes.
- Obscured star-formation and AGN activity in the early Universe.

## Education and Research Experience

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Sept 2019 -	<b>ESO Postdoctoral Fellow</b>	European Southern Observatory, Germany
Nov 2014 - Jan 2019	<b>Ph.D. in Astronomy</b> Thesis: <i>Colours of the extreme Universe - Panchromatic study of galaxies and AGN</i> Supervisors: Dr. Jacqueline Hodge, Prof. Huub Röttgering	Leiden Observatory, the Netherlands
May - Aug 2014	<b>Research Project</b> Project: <i>The SEDs of Dust Obscured Galaxies</i> Supervisor: Dr. Joseph Hennawi	Max Planck Institute for Astronomy, Germany
Oct 2011- April 2014	<b>M.Sc. in Physics</b> Thesis: <i>SED Fitting and Classification of Obscured AGN</i> Supervisors: Dr. Joseph Hennawi, Dr. Elisabeta Lusso	Heidelberg University / Max Planck Institute for Astronomy, Germany
June - Aug 2010	<b>Research Project</b> Project: <i>Ultra-compact Dwarf Galaxies: Remnants of Galaxy Disruption?</i> Supervisor: Dr. Thorsten Lisker	Astronomisches Rechen-Institut (ARI), Germany
Oct 2008- July 2011	<b>B.Sc. in Physics</b> Thesis: <i>The Lensed Temperature Anisotropy of the CMB</i> Supervisor: Prof. Matthias Bartelmann	Heidelberg University / Institute of Theoretical Astrophysics, Germany

## Scientific Talks

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I have delivered more than 20 scientific talks at conferences, workshops and seminars. I was invited to give 2 review talks on spectral energy distribution fitting of galaxies and AGN. I contributed 10 presentations at international conferences and I was also invited to give seminars in 8 different Astronomy institutes.

### Invited talks at conferences and workshops:

2018	CANDELS: The art of measuring physical parameters in galaxies	Riverside - USA
2018	Lorentz Center workshop on Photometric Redshifts	Leiden - the Netherlands

### Contributed talks at conferences and workshops:

2018 (Nov)	IAU S18: Challenges in Panchromatic Galaxy Modelling	Osaka, Japan
2018	The ISM as a window onto galaxy evolution - Symposium EWASS18	Liverpool, UK
2017	Distant Galaxies from the Far South	Bariloche - Argentina
2016	LOFAR Science Meeting	Leiden, Netherlands
2016	The Cosmic Dawn of Galaxy Formation	Paris, France
2016	AGN: What's in a name? - ESO workshop	Garching - Germany
2016	Latinamerican Regional IAU Meeting LARIM	Cartagena - Colombia
2015	Galaxy studies in the MIR - Symposium EWASS15	Tenerife, Spain

2015	The infrared-radio correlation - Special Session EWASS15	Tenerife, Spain
2014	Southern Cross Conference 2014 'Powerful AGN'	Port Douglas - Australia
<b>Invited seminar talks and collaborations visits:</b>		
2018	Galaxy Seminar at the CfA	Cambridge, USA
2018	Galaxy Formation Seminar at CCA	New York, USA
2018	Galaxy Seminar at Yale University	New Haven, USA
2018	ESO lunch talk	Garching, Germany
2018	ENIGMA Seminar at UCSB Santa Barbara <i>Collaboration with Dr. Joseph Hennawi (1 week)</i>	Santa Barbara, USA
2017	Visit at the Max Planck Institute for Radio Astronomy <i>Collaboration with Dr. Axel Weiss (1 week)</i>	Bonn, Germany
2017	LOFAR Science Seminar	ASTRON - Dwingeloo, The Netherlands
2016	Astronomy Seminar <i>Collaboration visits Prof. Martin Hardcastle (2 weeks)</i>	University of Hertfordshire, UK
2014	Seminar of Prof. Eisenstein's group	CfA, Harvard University, USA
<b>Technical schools:</b>		
2017	Summer School in Statistics for Astronomers <i>One week of lectures and programming at the Pennstate University</i>	State College, US
2014	LOFAR radio data processing school <i>One week hands-on technical school on big data and data reduction at ASTRON</i>	Dwingeloo, The Netherlands

## Publications

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First author: 3. Second author: 2. Total number of articles: 18, from which 13 are published or in press, 2 have been submitted by October 2018, and 3 are non-refereed or in preparation. Total citations: 142 (see List of Publications).

## Honours and awarded Grants

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2019	<b>IAU Astronomy for Development Grant</b> \$6 k as PI of the program COSMOamautas: Training Teachers in rural areas in Peru	
2018	<b>Leids Kerkhoven-Bosscha Fonds (LKBF)</b> \$1.4 k to visit different institutions in the USA.	Netherlands
2018	<b>IAU Travel grant</b> \$1.2k awarded to give a contributed talk in the IAU Symposium 314	Japan
2015 - 2016	<b>Leids Kerkhoven-Bosscha Fonds (LKBF)</b> \$1.8k for attending the Latin American Regional IAU Meeting (LARIM) and the Summer School in Statistics for Astronomers XIII/Penn State.	Netherlands
2013	<b>Best Poster Presentation Award</b> IAU Symposium 304 'Multiwavelength AGN Surveys and Studies'	Armenia
2012	<b>DAAD Fellowship for Master Studies (Equiv \$28k for 2 years)</b> Awarded for the best Bachelor graduates of the DAAD programme.	Germany
2008	<b>DAAD Fellowship for Bachelor Studies (Equiv \$31k for 3 years)</b> Awarded for the best high-school graduates from International-German schools. Chosen among schools from 50 different countries.	Germany

## Scientific Leadership and Teaching Activities

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2018 - 2019	<b>Supervision of a Master Student - Joost t' Hart</b> I <i>created</i> and am supervising the project 'Resolved SED-fitting of dusty galaxies at high-z'.	Leiden University
2018	<b>Supervision of a Bachelor Student - Danker Roozmond</b> I <i>created, planned and supervised</i> the project 'The AGN contribution in the ALESS SMG sample'. Project will be disseminated as a publication.	Leiden University
2017	<b>Supervision of a Bachelor Student - Auke Bruinsman</b> I supervised the project 'Spectral maps of radio jets in nearby galaxies.'	Leiden University
2017-2018	<b>Co-founder and organizer of the Leiden AGN Journal Club</b> Introduction of a biweekly journal club/ discussion/ show&tell; 13 participants.	Leiden Observatory
Sept 2015	<b>Organizer of the LOFAR Surveys Meeting 2015</b> I organized the scientific program and was in charge of the entire logistics of the international meeting of the LOFAR Surveys Consortium in 2015. The meeting hosted 80 participants with the aim of sharing the first science results of the LOFAR sky-surveys.	Leiden - The Netherlands
2016-2017	<b>Teaching Assistant 'Galaxies: Structure and Dynamics'</b> M.Sc. course, Prof. Rychard Bouwens	Leiden University
2012-2013	<b>Tutoring of Experimental Physics Lab for Physics</b> Electromagnetism lab for Bachelor students	Heidelberg University

## Telescope Experience

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### Radio and Sub-millimeter Interferometers:

2018	<b>ALMA Cycle 6 proposals</b> PI: Rybak, <i>Understanding high-redshift star-formation on 100-pc scales (5 h)</i> , accepted
2015	<b>LOFAR Cycle 5 &amp; 6</b> PI: Röttgering, <i>LOFAR surveys: Opening up a new window on the Universe, (1850 h)</i>

### Observing experience:

2016	<b>4 nights at the William Herschel Telescope</b> as Co-PI PI: Rigby, Redshift confirmation of starbursts and AGN	Santa Cruz de La Palma - Spain
2013	<b>5 nights at the NTT ESO Telescope, La Silla</b> as Co-PI PI: Hennawi, NIR spectroscopy. Redshift confirmation of QSOs.	La Silla - ESO Observatory - Chile

## Recent Outreach Activities

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2018	<b>Volunteer at the Discovery Club, Universe Awareness</b> Organized 3 week-ends of astronomy activities to groups of children that live in refugee centers in the Netherlands, with the aim to use astronomy to inspire, educate and entertain them.	Leiden, the Netherlands
2018	<b>Invited article in 'The Messenger' ESO Magazine</b> I was invited to write an article to present the results of Calistro-Rivera et al. (2018) as a highlight of ALMA science in the <i>The Messenger</i> magazine.	

## Languages

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Spanish (native), English (fluent), German (fluent), Italian (fluent), French (moderate), Dutch (moderate)

## References

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- **Asst. Prof. Jacqueline A. Hodge**  
Leiden Observatory, The Netherlands  
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- **Prof. Ian Smail**  
Durham University, UK  
ian.smail@durham.ac.uk
- **Prof. Huub Röttgering**  
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- **Assoc. Prof. Joseph F. Hennawi**  
UC Santa Barbara, USA  
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- **Prof. Martin Hardcastle**  
University of Hertfordshire, UK  
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- **Prof. Matthias Bartelmann**  
Heidelberg University, Germany  
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# List of publications

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First author: 3 (published), 1 (in prep). Second author: 2. Total number of articles: 18, from which 13 are published or in press, 2 have been submitted by October 2018, and 3 are non-refereed or in preparation. Total citations: 142.

## First and second author

1. Resolving the ISM at the peak of cosmic star formation with ALMA - The distribution of CO and dust continuum in  $z \approx 2.5$  sub-millimetre galaxies  
**Calistro-Rivera, G.**; Hodge, J.; Smail, I. et al. 2018, *ApJ*, 863, 56C, [CR18].
2. The LOFAR window on star forming galaxies and AGNs - curved radio SEDs and IR-radio correlation at  $0 < z < 2.5$ ,  
**Calistro-Rivera, G.**; Williams, W.; Hardcastle, M. et al. 2017, *MNRAS*, 469, 3468C, [CR17].
3. AGNfitter: A Bayesian MCMC Approach to Fitting Spectral Energy Distributions of AGNs,  
**Calistro-Rivera, G.**; Lusso, E.; Hennawi, J. et al. 2016, *ApJ*, 833, 98C, [CR16].
4. Resolved [CII]/CO/FIR continuum multi-tracer study of two  $z = 3$  dusty, star-forming galaxies  
Rybak, M.; **Calistro-Rivera, G.**; Hodge, J.; Smail, I.; et al. 2018, *ApJ*, submitted, [R,CR18].
5. LOFAR-Boötes: Properties of high- and low-excitation radio galaxies at  $0.5 < z < 2.0$ ,  
Williams, W.; **Calistro-Rivera, G.** et al. 2018, *MNRAS*, 475, 3429W, [W,CR18].

## Contributing author

6. Overdensity of SMGs around the  $z = 2.3$  MAMMOTH-1 nebula – The environment and the powering of an ELAN  
Arrigoni Battaia F., et al. (including **Calistro-Rivera, G.**) 2018, *A&A*, in press
7. LoTSS/HETDEX: Disentangling star formation and AGN activity in lensed radio-quiet quasars  
Stacey H. R., et al. (including **Calistro-Rivera, G.**) 2018, *A&A*, in press
8. LoTSS/HETDEX: Optical quasars -I. Low-frequency radio properties of optically selected quasars  
Gürkan, G. et al. (including **Calistro-Rivera, G.**) 2018, *A&A*, in press
9. The LOFAR Two-metre Sky Survey. II. First data release  
Shimwell, T. W., et al. (including **Calistro-Rivera, G.**) 2018, *A&A*, in press
10. The Far-Infrared Radio Correlation at low radio frequency with LOFAR/H-ATLAS,  
Read, S.C. et al. (including **Calistro-Rivera, G.**) 2018, *MNRAS*, 480, 5625R
11. LOFAR/H-ATLAS: the low-frequency radio luminosity-star formation rate relation,  
Gürkan, G. et al. (including **Calistro-Rivera, G.**) 2018, *MNRAS*, 475, 3010G
12. A Spatially Resolved Study of Cold Dust, Molecular Gas, H II Regions, and Stars in the  $z = 2.12$  SMG ALESS67.1,  
Chen, Chian-Chou et al. (including **Calistro-Rivera, G.**) 2017, *ApJ*, 846, 108C
13. The LOFAR Two-metre Sky Survey. I. Survey description and preliminary data release,  
Shimwell, T. W. et al. (including **Calistro-Rivera, G.**) 2017, *MNRAS*, 598A, 104S
14. The Lockman Hole project: LOFAR observations and spectral index properties of low-frequency radio sources,  
Mahoney, E.K et al. (including **Calistro-Rivera, G.**) 2016, *MNRAS*, 463.2997M
15. ALMA reveals evidence for spiral arms, bars and rings in high-redshift submillimeter galaxies  
Hodge, J. et al. (including **Calistro-Rivera, G.**) 2018, *ApJ*, submitted

## Publications in preparation and selected non-refereed publications:

16. The contribution of growing black-holes in dusty star-forming galaxies from the ALESS survey  
**Calistro-Rivera, G.**; Roozmond, D.; Vito, F. et al. (in preparation), to be submitted < 3 months. [CR19, in prep]
17. Resolving the Interstellar Medium at the Peak of Cosmic Star Formation  
**Calistro-Rivera, G.** & Hodge, J. 2018, *Invited article in The Messenger (ESO), No. 173 (Sept 2018)*
18. Fitting Spectral Energy Distributions of AGN - A Markov Chain Monte Carlo Approach  
**Calistro-Rivera, G.** et al. 2014, *Published on Proceedings of the IAU Symposia, IAU S304*