PERSONAL INFORMATION

Carlos Gómez Guijarro

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Date of birth 26th Dec. 1990 | Nationality Spanish

RESERCH PROFILE

My scientific interest is to discover our cosmic origins by exploring the formation and evolution of the structures in our Universe. In my research I use both detailed and statistical studies of galaxy samples and multiwavelength datasets ranging from X-ray to radio, being PI and Co-I of numerous observing time proposals. I always envision my research with a local and an international scope, collaborating with both small teams and big international collaborations. I am very active in transmitting my results in international conferences and my knowledge by supervising students.

WORK EXPERIENCE

2019/10–current	CNRS postdoctoral researcher at UMR AIM (DAp) - CEA Paris-Saclay Laboratory of Cosmology and Galaxy Evolution (LCEG)
2015/10–2019/09	PhD Fellow at Cosmic Dawn Center, Niels Bohr Institute, University of Copenhagen, Denmark Prior 2018/07 PhD Fellow at Dark Cosmology Centre, Niels Bohr Institute
2017/04–06	Research internship at Cornell University, USA
2013/02–2015/09	Research assistant at UCM, Spain
2015/07	Research internship at IRyA, Mexico
2014/07–09	Summer research internship at IAC, Spain

EDUCATION

2015/10–2019/03	PhD in Astrophysics, Niels Bohr Institute, University of Copenhagen, Denmark PhD degree awarded on May 15, 2019 - Advisor: Sune Toft Thesis: Connecting the Extremes - High-redshift Starbursts as Progenitors of Massive Galaxies
2013/10–2014/09	Master of Science in Astrophysics, Universidad Complutense Madrid, Spain Awarded with a distinction in the course *Galaxy Formation and Evolution*
2008/10–2013/09	Bachelor of Science in Physics and Astrophysics, Universidad Complutense Madrid, Spain Long cycle degree of 5 years - Top 10% of the class - Awarded with 12 distinctions

COLLABORATIONS

International teams and projects

2023–	ALMA-FPA development study (co-I)
2022–	Public Release Imaging for Extragalactic Research (JWST), PRIMER (member)
2022–	The Cosmic Evolution Early Release Science Survey (JWST), CEERS (member)
2019–	GOODS-ALMA, 1.1mm galaxy survey (data manager)
2018–	BUFFALO, a HST survey in the Frontier Fields (member)
2015–	The Cosmic Evolution Survey, COSMOS (member)
2015–	SHARDS, an ESO/Gran Telescopio Canarias large program in GOODS-N and the Frontier Fields (member)

International collaborations

CEA Saclay/LAM (France), DAWN/DARK (Denmark), ESO (Germany), NOIRLab/Stanford University/NASA Ames/Cornell University (USA), IRyA (Mexico), CAB/IAC/UCM (Spain)

PUBLICATION SUMMARY

(as of 31th Januray 2023)

- 8 first-author publications in peer-reviewed journals with 256 citations
- 60 publications in peer-reviewed journals with 1814 citations
- H-index: 26

SCHOLARSHIPS AND AWARDS

2015/10–2019/03 PhD Fellowship, Niels Bohr Institute, University of Copenhagen, Denmark

2014/07–2014/09 Summer Grant at the IAC within the Program of Initiation to Astrophysical Research

2013–2014 Collaboration Scholarship by the Ministry of Education of the Spanish Government
Awarded to talented students to collaborate with a university department

2008–2009 Scholarship for Outstanding Students by the Education Office of the Community of Madrid
Awarded to students with the top grades at the Spanish University Access Test

KEY PRACTICAL SKILLS

Data reduction

- Processing of optical/near-IR imaging drizzled data (JWST, HST)
- Calibration and imaging of (sub)mm/radio interferometric data (ALMA, VLA)
- Processing of optical/near-IR spectroscopy (Keck/MOSFIRE, NOT/ALFOSC and FIES)
- Processing of X-ray imaging data (Chandra)

Data analysis

- Development of an aperture photometry code
- Development of an interferometric uv-plane stacking code
- Analysis of optical/near-IR and sub(mm)/radio imaging and spectra
- Source detection, photometry, and catalog build-up of optical/near-IR (SExtractor, aperture and model fitting photometry) and (sub)mm/radio (PyBDSF, photometry in image and uv-plane) data
- SED fitting of optical/near-IR (EAZY, FAST, LePhare) and far-IR/panchromatic (CIGALE) data
- Morphological fitting of optical/near-IR (GALFIT, Statmorph) and (sub)mm/radio (CASA, GILDAS) data
- Machine Learning techniques (CNN, Random forests)

Computing

- Programming: Python, R, C/C++, MATLAB - Mathematics: Maple, Mathematica
- Operating systems: Linux, Mac, Windows – Office automation: LaTeX, MS Office

Languages

- Spanish: Mother tongue
- English: Full working proficiency (C2)
- French: Limited working proficiency (B2)

OBSERVING TIME ALLOCATION AND EXPERIENCE

Proposal time allocation

Optical/near-IR:

PI – ESO/KMOS 112.25EX (2h B - *Resub*): Instantaneous star formation rate to uncover the role of compact star formation
PI – ESO/KMOS 110.23UN (8h B grade): Instantaneous star formation rate to uncover the role of compact star formation
Co-I – JWST-GO-03567 (47.6h): A deep dive into the physics of the first massive quiescent galaxies in the Universe
Co-I – ESO/X-Shooter 112.25C4 (53h A - *Resub*): Deep spectroscopy of bright red massive quiescent galaxies at z ~ 2.5 - 3
Co-I – ESO/FORS2 112.25JF (6h B grade): Unveiling Mpc-scale structure of a maturing protocluster at z = 3.61
Co-I – ESO/KMOS 111.24JS (31h B grade - *Resub*): The gas content of sub-millimeter compact galaxies at cosmic noon
Co-I – ESO/KMOS 110.240K (21.3h B grade): Uncovering the role of optically dark galaxies in an overdensity at z = 3.5
Co-I – ESO/X-Shooter 109.22Y5 (56h A grade): Deep spectroscopy of bright red massive quiescent galaxies at z ~ 2.5 - 3
Co-I – ESO/KMOS 109.23CE (31h B grade): The gas content of sub-millimeter compact galaxies at cosmic noon
Co-I – Keck/MOSFIRE S22A-046 (2nights): The emerge of the first quiescent galaxies – take 2
Co-I – Gemini/GMOS 21BCF05 (9.8h): Are submm compact main sequence galaxies actually faded starbursts?
Co-I – Keck/MOSFIRE S20B-031 (2nights): The emerge of the first quiescent galaxies
Co-I – Keck/MOSFIRE S20A-037 (1nights): Direct spectroscopic confirmation of z > 4 quiescent galaxies
Co-I – Keck/MOSFIRE S18B-040 (1nights): Direct spectroscopic confirmation of z > 4 quiescent galaxies
Co-I – HST GO 15117 (101orbits): BUFFALO
Co-I – Keck/MOSFIRE S17B-106 (1nights): Direct spectroscopic confirmation of z > 4 quiescent galaxies

(Sub)mm/radio:

PI – NOEMA W23CU (6h A grade): Dead or alive? A z = 4.106 quiescent galaxy with slow outflows
PI – VLA 22B-243 (13.2h B grade): The true extent of the cold gas content in a red sequence progenitor
PI – NOEMA W21CO (8h B grade): Uncovering a unique population of gas giants at z = 1.2
PI – NOEMA W19CV (7.3h B grade): Peering into the pace of massive galaxy evolution
Co-I – ALMA 2023.1.01571.S (36.4h C grade): On the formation of cosmic DUNES: The first dusty galaxies of the universe
Co-I – ALMA 2023.1.00837.S (1h A grade): Hidden in plain sight: dynamical mass estimates for a newly-discovered red monster at zspec~5.6 in the GOODS-S field
Co-I – ALMA 2023.1.00652.S (6.5h C grade): Unveiling the Mpc-scale structure of a maturing protocluster at z = 3.61

Co-I – ALMA 2023.1.00180.L (143.5h A grade): The COSMOS High-z ALMA-MIRI Population Survey (CHAMPS): A Wide-Area Comprehensive Survey of the Dusty Universe
Co-I – ALMA 2023.1.00170.S (6.7h B grade): Caught in the Web: ALMA Data for Every Sub-Millimeter Galaxy Over the COSMOS-Web Survey Field
Co-I – NOEMA S23CT (5.4h A grade): CII follow-up for a dusty star-forming galaxy at z=6.09
Co-I – NOEMA S23CY (12h A grade): Revealing the interstellar medium of two extremely massive galaxies at z > 7
Co-I – NOEMA W22DA (14h B grade): JWST and NOEMA unveil the nature of submm-compact galaxies
Co-I – VLA 22B-124 (67.1h B grade): A golden reference for ISM studies of distant normal galaxies: completion
Co-I – ALMA 2022.1.00884.S (8.7h A grade): Redshift scans for dusty star-forming galaxies at cosmic dawn
Co-I – NOEMA S22CN (20h A grade): Optically-dark galaxies in the EGS field
Co-I – VLA 22A-400 (60h B grade): High redshift star formation and AGN activity in the JWST CEERS public survey
Co-I – NOEMA M21AA (159h A grade): NOEMA forming-clusters evolution survey (NICE)
Co-I – VLA 21B-292 (60h C grade): High redshift star formation and AGN activity in the JWST CEERS public survey
Co-I – ALMA 2021.1.00815.S (39.8h C grade): Testing structure formation, quenching and gas accretion models
Co-I – VLA 21A-133 (165.5h B grade): A golden reference for ISM studies of distant normal galaxies
Co-I – VLA 21A-043 (11.5h C - *Resubmission*): Flares, breaks and warps in the outskirts of the HI and stellar disk of UGC11859
Co-I – VLA 20B-247 (24.2h C grade): Investigating possible non-gravitational ICM heating in a galaxy cluster at z = 2
Co-I – VLA 20A-485 (9h C grade): Flares, breaks and warps in the outskirts of the HI and stellar disk of UGC11859
Co-I – NOEMA 225-19 (22h B grade): Knocking on giant's door: A large-scale view of candidate z > 4 dusty galaxies
Co-I – ALMA 2018.1.01676.S (9.4h C grade): A total mass profile for a prototypical z ~ 4.6 massive star forming disk galaxy
Co-I – ALMA 2018.1.01225.S (19.4h C - *Resubmission*): What is the origin and subsequent evolution of starbursts at z ~ 2?
Co-I – ALMA 2016.1.01001.S (14.6h C grade): What is the origin and subsequent evolution of starbursts at z ~ 2?

Visitor observations — Gran Telescopio Canarias 10.4m (OSIRIS, 1night); Keck 10m (MOSFIRE, 2half-nights); Nordic Optical Telescope 2.6m (ALFOSC and FIES, 8nights); Calar Alto Observatory 2.2m (CAFOS and FOCES, 3nights)

CONFERENCES AND WORKSHOPS

Invited talks

Participation through personal invitation:

2023/06 French Society of Astronomy Meeting 2023, Strasbourg, France
2023/03 The growth of galaxies in the early universe VIII, Sexten, Italy
2022/11 BOBAFET (transdisciplinary SFH workshop), LAM, Marseille, France
2022/03 The growth of galaxies in the early universe VII, Sexten, Italy
2021/11 Sino-French workshop: Simulations and observations of galaxies and protoclusters, Nanjing (Virtual), China
2021/10 High-z dusty galaxies, LAM, Marseille, France
2020/01 The growth of galaxies in the early universe VI, Sexten, Italy
2018/03 Galaxy interactions and mergers across cosmic time, Sexten, Italy
2017/11 The physics of quenching massive galaxies at high redshift, Leiden, The Netherlands

Contributed talks

Participation through abstract review:

2023/11 Resolving the extragalactic universe with ALMA and JWST, Tokyo, Japan
2023/07 GECO conference – Shedding new light on the first billion year of the Universe, Marseille, France
2022/06 EAS 2022 – The main sequence: going beyond the scaling relation, Valencia, Spain
2022/06 EAS 2022 – The ISM of infrared galaxies from present to cosmic noon, Valencia, Spain
2022/03 Cosmic nuggets: A feast of compact and massive galaxies across the universe, Sexten, Italy
2020/03 IAU Symposium 359: Galaxy evolution and feedback across different environments, Bento Gonçalves, Brazil
2018/09 Birth, life and fate of massive galaxies and their central beating heart, Favignana, Italy
2018/08 IAU GA 2018 – Division J Meeting – Build-up of galaxy clusters, Vienna, Austria
2018/07 Spanish Society of Astronomy Meeting 2018, Salamanca, Spain
2014/09 Spanish Society of Astronomy Meeting 2014, Teruel, Spain

Team meeting talks

Participation through team membership:

2023/05 CEERS Team Meeting 2023, Austin, USA
2022/07 COSMOS Team Meeting 2022, Paris, France
2019/11 ASPECS Team Meeting 2019, Schloss Ringberg, Germany
2019/09 GOODS-ALMA Meeting 2019, CEA Saclay, France
2018/06 COSMOS Team Meeting 2018, Copenhagen, Denmark
2017/07 COSMOS Team Meeting 2017, Kyoto, Japan
2016/06 COSMOS Team Meeting 2016, Baltimore, USA

Posters — Participation through abstract review:

- 2023/07 EAS 2023 – Coming out of darkness: how JWST is changing our view of high-z dusty galaxies, Kraków, Poland
- 2021/06 EAS 2021, Leiden (Virtual), The Netherlands
- 2017/08 SMG20, Durham, UK
- 2014/06 EWASS 2015 – Galaxy studies in the mid-infrared form space and ground, Tenerife, Spain

COLLOQUIA, SEMINARS, AND TALKS

Colloquia series — Through abstract review:

- 2022/03 Hypatia Colloquium 2022, ESO Garching, Germany

Invited talks — Through personal invitation:

- 2023/05 Space Science & Astrobiology Division seminars, NASA Ames, California, USA
- 2023/05 KIPAC Cosmology seminars, Stanford University, California, USA
- 2022/02 Department of Astronomy seminars, Stockholm University, Sweden
- 2021/12 Joint ALMA Observatory colloquia, Santiago, Chile
- 2021/05 CAB MdM seminars, Centro de Astrobiología, Madrid, Spain
- 2021/03 IPARCOS astro-seminars, Universidad Complutense, Madrid, Spain
- 2019/11 Journal club seminars, IAP, Paris, France

Visitor talks — During a scientific visit:

- 2023/12 Café club, LAM, Marseille, France
- 2022/11 Cake talks, DAWN, Copenhagen, Denmark
- 2017/11 Subaru seminars, Subaru Telescope, Hawaii, USA
- 2017/11 Freddie seminars, IfA, Hawaii, USA
- 2016/04 Advanced radio astronomy seminars, Cornell University, USA

Local talks — As a local scientist:

- 2023/06 DAp postdocs seminars, CEA Saclay, France
- 2020/05 LCEG DAp seminars, CEA Saclay, France
- 2019/05 Interferometry seminar, DARK, Copenhagen, Denmark
- 2018/03 Cake talks, DARK, Copenhagen, Denmark

STUDENT SUPERVISION

- 2022/10– Maxime Tarrasse, PhD student, CEA Saclay, France – Co-supervisor (50%)
- 2021/10– David Blánquez Sesé, PhD student, DAWN - DTU, Copenhagen, Denmark – Co-supervisor (50%)
- 2022/11– Rosa Maria Mérida, PhD student, CAB, Spain – Project supervisor (100% on specific PhD thesis project)
- 2019/10–2022/12 Mengyuan Xiao, PhD student, CEA Saclay/Nanjing University, France/China – Co-supervisor (50%)
- 2021/01–06 Guillaume Villaret, Master student (M1), CEA Saclay, France – Main supervisor (100%)
- 2020/01–06 David Blánquez Sesé, Master student, DAWN - DTU, Copenhagen, Denmark – Co-supervisor (33%)
- 2022/04–06 Victor Jaulin, Bachelor student (L3), CEA Saclay, France – Main supervisor (100%)

TEACHING EXPERIENCE

Teaching assistant — University of Copenhagen (280h over three courses):

- 2018 Danish Summer School in observational astronomy (Master level course)
- 2017–2018 Cosmology (3rd year physics bachelor course)
- 2016 Niels Bohr Institute Summer School in observational astronomy (Master level course)

PROFESSIONAL SERVICE

Organization of

scientific meetings

2023/07 EAS 2023 Symposium – Early assembly of galaxies with JWST spatially resolved spectroscopy and photometry (SOC), Krakow, Poland

2018/06 COSMOS Team Meeting 2018 (LOC), Copenhagen, Denmark

Reviewer

2023 PhD thesis external referee – Ángela García Argumánez (UCM, Spain)

2019– Referee for ApJ, A&A, and MNRAS

2022–2023 Evaluation of ESO Period 110, 112 proposals

2021–2023 Evaluation of ALMA Cycle 8, 9, 10 proposals

2018 Evaluation of a Gemini telescope proposal on behalf of the Canadian Time Allocation Committee

Others

2020– Organization team member of the astrophysics seminars of the DAp, CEA Saclay, France

2018 Creator, organizer and speaker of the seminar series *All you always wanted to know about*, aimed at discussing and sharing knowledge about general astronomy topics, DARK, Copenhagen, Denmark

OUTREACH

2019/12 Interview for the podcast *Hablando con Científicos* of cienciaes.com, Madrid, Spain

2018/10 Exhibiter at the event *Art in Science* during the Culture Night 2018, Copenhagen, Denmark
As winner of the *Mega* category in the 2017 contest

2017/10 Exhibiter at the event *Art in Science* during the Culture Night 2017, Copenhagen, Denmark

2013/03 Volunteer at *La Uni en la Calle* (2nd edition), Madrid, Spain

2012/11 Volunteer at *La Uni en la Calle* (1st edition), Madrid, Spain

2009/11 Volunteer at the *IX Week of Science*, Madrid, Spain

REFERENCES

Prof. Sune Toft	DAWN - U. Copenhagen, Denmark	sune@nbi.ku.dk
Dr. David Elbaz	CEA Saclay, France	david.elbaz@cea.fr
Prof. Georgios Magdis	DAWN - DTU, Denmark	geoma@space.dtu.dk
Dr. Emanuele Daddi	CEA Saclay, France	edaddi@cea.fr
Dr. Laure Ciesla	LAM, France	laure.ciesla@lam.fr
Prof. Dominik Riechers	University of Cologne, Germany	riechers@ph1.uni-koeln.de
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