

PERSONAL  
INFORMATION

Carlos Gómez Guijarro

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Date of birth 26th Dec. 1990 | Nationality Spanish

## RESEARCH 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
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	Visiting intern at Cornell University, USA
2013/02–2015/09	Research assistant at UCM, Spain
2015/07	Visiting intern at IRyA, Mexico
2014/07–09	Research intern at IAC, Spain

## EDUCATION

2015/10–2019/09	PhD in Astrophysics, Niels Bohr Institute, University of Copenhagen, Denmark PhD degree awarded on May 15, 2019 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 Average grade: 9.0/10 – Thesis: 9.2/10 - Distinction in the course <i>Galaxy Formation and Evolution</i>
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 – Access grade: 9.23/10

## 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 31<sup>th</sup> 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

- 2015/10–2019/09 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: Professional working proficiency (C1)

## 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  $z \sim 2.5 - 3$
- 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  $z \sim 2.5 - 3$
- 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  $z_{\text{spec}} \sim 5.6$  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  $z \sim 4.6$  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  $z \sim 2$ ?

Co-I – ALMA 2016.1.01001.S (14.6h C grade): What is the origin and subsequent evolution of starbursts at  $z \sim 2$ ?

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)

## Visitor observations

## 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 from 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 Blázquez 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 Blázquez 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 (3<sup>rd</sup> year physics bachelor course)
- 2016 Niels Bohr Institute Summer School in observational astronomy (Master level course)

PROFESSIONAL  
SERVICEOrganization 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 Exhibitor 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 Exhibitor at the event *Art in Science* during the Culture Night 2017, Copenhagen, Denmark
- 2013/03 Volunteer at *La Uni en la Calle* (2<sup>nd</sup> edition), Madrid, Spain
- 2012/11 Volunteer at *La Uni en la Calle* (1<sup>st</sup> 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
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