Dr. Guido Roberts-Borsani

Curriculum Vitae

General Information:
475 Portal Plaza,
University of California, Los Angeles,
California 90095, USA
Website: https://www.robertsborsani.com

Phone: +1 (213) 509-5085
Email: guidorb@astro.ucla.edu
Primary languages: English, Italian, French

References:
Prof. Tommaso Treu, University of California, Los Angeles (tt@astro.ucla.edu)
Prof. Richard Ellis, University College London (richard.ellis@ucl.ac.uk)
Prof. Adriano Fontana, INAF, Rome Observatory (adriano.fontana@inaf.it)
Prof. Amélie Saintonge, University College London (a.saintonge@ucl.ac.uk)

Scientific Interests

- Galaxy formation and evolution in the early Universe.
- Supermassive black holes.
- Galactic scale outflows.

Education

June 2019	**Ph.D in Astrophysics** *(University College London, UK)* *Supervisors: Prof. Amélie Saintonge and Prof. Richard Ellis*
June 2014	**MPhys in Astronomy, Space Science & Astrophysics with a year at UC San Diego** *(University of Kent, Canterbury, UK)* *Supervisor: Prof. Stephen Lowry*
June 2010	**European Baccalaureate** *(École Européenne de Bruxelles II, Brussels, Belgium)*

Positions

2019-present	**Postdoctoral Scholar** *(University of California, Los Angeles, USA)*
June-Sept. 2019	**Postdoctoral Scholar** *(University College London, UK)*
2015-2019	**Astrophysics Ph.D. student** *(University College London, UK)*
July-Aug. 2014	**LEAPS Intern at ESTEC** *(European Space Agency, Netherlands)*
2010-2014	**Undergraduate** *(University of Kent, UC San Diego)*

Awards & Grants

Nov. 2022	**UCLA Chancellor's Award for Postdoctoral Research**
June 2022	**SNSF Postdoctoral Fellowship 2022** - Observatoire Astronomique, University of Geneva (Accepted, starting June 2023)
Jan. 2022	**DAWN Fellowship 2022** - DAWN Center, University of Copenhagen (Declined)
Dec. 2021	**ESO Fellowship 2022** - ESO Garching (Declined)
Nov. 2021	**STScI grant ($227,992)** for Cycle 1 GO *JWST* program (GO 1747, PI Roberts-Borsani)

Scientific Organizational Experience

July 2020	EAS 2020 symposium: S13 Probing Cosmic Dawn with Current and Future Facilities and Simulations.

Mentoring Experience

- Co-supervision of an undergraduate student at UCL, *Seung Jae Lee*. Summer term 2018.
  – *Determining the AGN vs star-forming natures of low-z galaxies in the MaNGA survey.*

- Co-supervision of a PhD student at UCLA, *Lilan Yang*. 2019-2020 academic year.
  – *Constraining the size-mass relation at $z = 1 - 3$ and $z = 6 - 9$ with the Hubble Frontier Fields (published in Yang, Roberts-Borsani et al., MNRAS, 501, 1028, 2021, and Yang et al., incl. Roberts-Borsani, MNRAS in press, 2022)*

- Supervision of an undergraduate student at UCLA, *Amaury Vazquez*. Fall 2021-present.
  – Determining and contrasting the average star formation histories of extreme emission line galaxies at $z \sim 7$ HST and Spitzer/IRAC data from CANDELS (Vazquez, Roberts-Borsani, et al. in prep.)

Computer Skills

Scientific software:

LaTex, DS9, QFitsView, ESO pipelies (Gasgano, Reflex, X-Shooter), IRAF, DIPSO, EAZY, CLASS, EAO reduction software, Overleaf, Keck/MOSFIRE reduction software, pPXF, PyMultinest, PypeIt, Mirage, STScI JWST data reduction software.

Programming:

Working knowledge of Python, IDL, GitHub.

Observing Experience & Data Reduction

Optical/NIR spectroscopy:

3 nights observing in visitor mode with ESO-VLT/X-Shooter: spectroscopic follow up of high-z sources. 13 nights observing with Keck/MOSFIRE and 3 nights with Keck/NIRES (in both visitor and remote modes): spectroscopic follow up of high-z sources.

(Sub)millimetre and radio spectroscopy:

>100 hrs observing in visitor mode with the IRAM 30m telescope: CO spectroscopy for the xCOLD GASS survey, CO follow up of SAMI galaxies, and redshift determination of a high-z galaxy for an IRAM summer school. 3 nights observing (2 in visitor mode, 1 remotely) with the JCMT: observations for the JINGLE survey.

Data reduction:

VLT/X-Shooter, Keck/MOSFIRE, Keck/NIRES, IRAM 30m/EMIR, JCMT/SCUBA-2, NTT/EFOSC2, Gemini/FLAMINGOS2, JWST/NIRISS, JWST/NIRCam.

Public Speaking

Invited Talks & Seminars

Dec. 2022	**Invited Talk (First Science Results with JWST, STScI)** Talk: *First Light With JWST - Unveiling Galaxy Populations and Their Properties at Cosmic Dawn*
Oct. 2022	**Invited Seminar (UC Santa Barbara)** Talk: *First Light: Searching for and Characterizing Galaxies at the Dawn of Cosmic Time*
Oct. 2022	**Invited Seminar (UC Riverside)** Talk: *First Light: Searching for and Characterizing Galaxies at the Dawn of Cosmic Time*
Sept. 2022	**Invited Plenary Speaker (International Astronautical Congress)** Talk: *First results from the GLASS-JWST survey*
April 2022	**Invited Seminar (University of St Andrews)** Talk: *Age-dating Galaxies in the Epoch of Reionization and Pinpointing Cosmic Dawn*
March 2022	**I2I: Linking Galaxy Physics From ISM To IGM Scales** Talk: *Age-dating Galaxies in the Epoch of Reionization and Pinpointing Cosmic Dawn*
March 2022	**The Growth of Galaxies in the Early Universe VII** Talk: *Unveiling the Physics of Reionization-era Galaxies with JWST*
June 2021	**EAS Conference (online)** Talk: *Age-dating $z > 7$ Galaxies and Implications for Cosmic Dawn*
June 2021	**SAZERAC2 Conference (online)** Talk: *The Global Properties of Luminous $z > 8$ Galaxies and Cosmic SFR Density from (Pure-)Parallel Observations*
May 2021	**Invited Seminar (University of California, Los Angeles, USA)** Talk: *Age-dating Galaxies in the Reionization era and Pinpointing the Timing of Cosmic Dawn*
Jan. 2021	**EURECA Seminar (University of Arizona, Arizona, USA)** Talk: *Age-dating Galaxies in the Reionization era and Pinpointing the Timing of Cosmic Dawn*
July 2020	**SAZERAC Conference (online)** Talk: *Age-dating $z > 7$ Galaxies and Implications for Cosmic Dawn*
Sept. 2019	**Extremely Big Eyes on the Early Universe Conference (Rome, Italy)** Talk: *Determining the Stellar Ages of Galaxies in the Reionisation Era*
June 2019	**Invited Seminar (University of Nottingham, Nottingham, UK)** Talk: *Galactic-scale outflows in galaxies of the local Universe.*
June 2019	**Invited Seminar (Cardiff University, Cardiff, UK)** Talk: *A multiwavelength perspective of galactic scale outflows.*
March 2019	**Invited Seminar (University of Oxford, Oxford, UK)** Talk: *A multiwavelength perspective of galactic scale outflows.*
Jan. 2019	**Invited Seminar (MSSL, London, UK)** Talk: *Galaxy outflows in the local Universe.*
July 2018	**The Laws of Star Formation conference (Cambridge, UK)** Talk: *The nature and prevalence of cold gas outflows across the local SFR-M_* plane.*
April 2018	**EWASS conference (Liverpool, UK)** Talk: *The nature and prevalence of cold gas outflows across the local SFR-M_* plane.*
Oct. 2017	**Gas in Galaxies conference (Valletta, Malta)** Talk: *The dichotomy of cold gas inflows and outflows across the SFR-M_* plane in the low redshift Universe.*
July 2016	**EWASS conference (Athens, Greece)** Talk: *Galaxy outflows: a multiwavelength perspective.*
June 2016	**NAM conference (Nottingham, UK)** Talk: *The first galaxies: a view from HST and Spitzer.*

April 2016 **RAS Specialist Discussion Meeting: High-redshift galaxies and their low-redshift analogues (London, UK)**
Talk: *The first galaxies: a view from HST and Spitzer*

Outreach talks and events

Sept. 2022 **STScI Public Lecture**
First Light: Hunting for Galaxies at the Dawn of Cosmic Time

May 2021 **ESA Webb Twitter Q&A**
Live Q&A answering questions from the general public on Twitter.

Nov. 2021 **Astronomy on Tap (Los Angeles, USA)**
Talk: *Hunting for Galaxies at the Dawn of Cosmic Time*

Dec. 2018 **Diploma Club (London, UK)**
Talk: *Mapping the local Universe with large multiwavelength galaxy surveys.*

Nov. 2018 **WOLAS (London, UK)**
Talk: *Mapping Cosmic Dawn and the first billion years of the Universe.*

June 2018 **HGS Astronomical Society (London, UK)**
Talk: *Mapping the evolution of galaxies across cosmic time.*

May 2018 **International Day of Light, UCL (London, UK)**
Day of activities and shows with high-school students, relating to the exploration of the high-redshift Universe.

May 2017 **Astro-Londres, Lycée Francais Charles de Gaulle (London, UK)**
Two days of astronomy-related activities and talks with secondary students at the French high school.

Jan. 2016 **Diploma Club (London, UK)**
Talk: *Searching for the most distant galaxies in the Universe.*

Publication List & Statistics

Summary as of 3 December 2022:

36 peer-reviewed publications, 4 in press, 9 currently under review.
2,096 citations according to NASA ADS.
H-index of 8.

First Author

1. *Early Results from GLASS-JWST. I: Confirmation of Lensed $z \geqslant 7$ Lyman-Break Galaxies Behind the Abell 2744 Cluster With NIRISS*, **Roberts-Borsani**, Morishita, Treu, Brammer, Strait, Wang, Bradac, Acebron, Bergamini, Boyett, Calabró, Castellano, Fontana, Glazebrook, Grillo, Henry, Jones, Malkan, Marchesini, Mascia, Mason, Mercurio, Merlin, Nanayakkara, Pentericci, Rosati, Santini, Scarlata, Trenti, Vanzella, Vulcani, Willott, ApJL, 938, 13, 2022

2. *Early Results from GLASS-JWST. I: Confirmation of Lensed $z \geqslant 7$ Lyman-Break Galaxies Behind the Abell 2744 Cluster With NIRISS*, **Roberts-Borsani**, Morishita, Treu, Brammer, Strait, Wang, Bradac, Acebron, Bergamini, Boyett, Calabró, Castellano, Fontana, Glazebrook, Grillo, Henry, Jones, Malkan, Marchesini, Mascia, Mason, Mercurio, Merlin, Nanayakkara, Pentericci, Rosati, Santini, Scarlata, Trenti, Vanzella, Vulcani, Willott, ApJL, 938, 13, 2022

3. *The Physical Properties of Luminous $z \gtrsim 8$ Galaxies and Implications for the Cosmic Star Formation Rate Density From ~0.35 deg^2 of (Pure-)Parallel HST Observations*, **Roberts-Borsani**, Morishita, Treu, Leethochawalit, Trenti, ApJ, 927, 236, 2022

4. *Improving $z \sim 7-11$ Galaxy Property Estimates with JWST/NIRCam Medium-band Photometry*, **Roberts-Borsani**, Treu, Mason, Schmidt, Jones, Fontana, ApJ, 910, 86, 2021

5. *Interpreting the Spitzer/IRAC colours of $7 \geq z \geq 9$ galaxies: distinguishing between line emission and starlight using ALMA*, **Roberts-Borsani**, Ellis, Laporte, MNRAS, 497, 3440, 2020

6. *Observational constraints on the multiphase nature of outflows using large spectroscopic surveys at $z \sim 0$*, **Roberts-Borsani**, MNRAS, 494, 4266, 2020

7. *Outflows in star-forming galaxies: Stacking analyses of resolved winds and the relation to their hosts' properties*, **Roberts-Borsani**, Saintonge, Masters, Stark, MNRAS, 493, 3081, 2020

8. *The prevalence and properties of cold gas inflows and outflows around galaxies in the local Universe*, **Roberts-Borsani** & Saintonge, MNRAS, 482, 4111, 2019

9. *Multiwavelength Characterization of an ACT-selected, Lensed Dusty Star-forming Galaxy at $z = 2.64$*, **Roberts-Borsani**, Jiménez-Donaire, Daprá, Alatalo, Aretxaga, Álvarez-Márquez, Baker, Fujimoto, Gallardo, Gralla, Hilton, Hughes, Jiménez, Laporte, Marriage, Nati, Rivera, Sievers, Weiß, Wilson, Wollack, Yun, ApJ, 844, 110, 2017

10. *$z \gtrsim 7$ Galaxies with Red Spitzer/IRAC [3.6]-[4.5] Colors in the Full CANDELS Data Set: The Brightest-Known Galaxies at $z \sim 7-9$ and a Probable Spectroscopic Confirmation at $z = 7.48$*, **Roberts-Borsani**, Bouwens, Oesch, Labbé, Smit, Illingworth, van Dokkum, Holden, Gonzalez, Stefanon, Holwerda, Wilkins, ApJ, 823, 143, 2016

Contributions

1. *Early Results From GLASS-JWST. XII: The Morphology of Galaxies at the Epoch of Reionization*, Treu et al., incl. **Roberts-Borsani**, ApJL, accepted in press, 2022

2. *Early results from GLASS-JWST. X: Rest-frame UV-optical properties of galaxies at 7 ¡ z ¡ 9*, Leethochawalit et al., incl. **Roberts-Borsani**, ApJL, accepted in press, 2022

3. *Early results from GLASS-JWST VIII: An Extremely Magnified Blue Supergiant Star at Redshift 2.65 in the Abell 2744 Cluster Field*, Chen et al., incl. **Roberts-Borsani**, ApJL, accepted in press, 2022

4. *Early results from GLASS-JWST. VII: evidence for lensed, gravitationally bound proto-globular clusters at z=4 in the Hubble Frontier Field A2744*, Vanzella et al., incl. **Roberts-Borsani**, ApJL, accepted in press, 2022

5. *Early results from GLASS-JWST. VI: Extreme rest-optical equivalent widths detected in NIRISS Wide Field Slitless Spectroscopy*, Boyett et al., incl. **Roberts-Borsani**, ApJL, accepted in press, 2022

6. *A lensed protocluster candidate at z=7.66 identified in JWST observations of the galaxy cluster SMACS0723-7327*, Laporte et al., incl. **Roberts-Borsani**, A&A, 667, 3

7. *The prevalence of galaxy overdensities around UV-luminous Lyman-α emitters in the Epoch of Reionization*, Leonova et al., incl. **Roberts-Borsani**, MNRAS, 515, 5790, 2022

8. *Early results from GLASS-JWST. V: The First Rest-frame Optical Size-Luminosity Relation of Galaxies at z>7*, Yang et al., incl. **Roberts-Borsani**, ApJL, 938, 17, 2022

9. *Early results from GLASS-JWST. IV: Spatially resolved metallicity in a low-mass z∼3 galaxy with NIRISS*, Wang et al., incl. **Roberts-Borsani**, ApJL, 938, 16

10. *Early results from GLASS-JWST. III: Galaxy candidates at z∼9-15*, Castellano et al., incl. **Roberts-Borsani**, ApJL, 938, 15

11. *Early results from GLASS-JWST. II: NIRCam extra-galactic imaging and photometric catalog*, Merlin et al., incl. **Roberts-Borsani**, ApJL, 938, 14, 2022

12. *The GLASS-JWST Early Release Science Program. I. Survey Design and Release Plans*, Treu, **Roberts-Borsani**, et al., ApJ, 935, 110, 2022

13. *The size-luminosity relation of lensed galaxies at* $z = 6 - 9$ *in the Hubble Frontier Fields*, Yang et al., incl. **Roberts-Borsani**, MNRAS, 514, 1148, 2022

14. *Possible Systematic Rotation in the Mature Stellar Population of a z = 9.1 Galaxy*, Tokuoka et al., incl. **Roberts-Borsani**, ApJ, 933, 19, 2022

15. *A quantitative assessment of completeness correction methods and public release of a versatile simulation code*, Leethochawalit et al., incl. **Roberts-Borsani**, MNRAS, 509 5836

16. *Probing cosmic dawn: Ages and star formation histories of candidate* $z \geq 9$ *galaxies*, Laporte et al., incl. **Roberts-Borsani**, MNRAS, 505, 3336, 2021

17. *The VANDELS ESO public spectroscopic survey. Final data release of 2087 spectra and spectroscopic measurements*, Garilli et al., incl. **Roberts-Borsani**, 647, 150, 2021

18. *The evolution of the size-mass relation at* $z = 1 - 3$ *derived from the complete Hubble Frontier Fields data set*, Yang, **Roberts-Borsani** et al., MNRAS, 501, 1028, 2021

19. *Centrally concentrated molecular gas driving galactic-scale ionized gas outflows in star-forming galaxies*, Hogarth et al., inc. **Roberts-Borsani**, MNRAS, 500, 3802, 2021

20. *SuperBoRG: Exploration of Point Sources at* $z \sim 8$ *in HST Parallel Fields*, Morishita, Stiavelli, Trenti, Treu, **Roberts-Borsani** et al., ApJ, 904, 50, 2020

21. *The Mass-Metallicity Relation at* $z \sim 8$*: Direct-method Metallicity Constraints and Near-future Prospects*, Jones et al., Sanders, **Roberts-Borsani** et al., ApJ, 903, 150, 2020

22. *The Super Eight Galaxies: Properties of a Sample of Very Bright Galaxies at* $7 < z < 8$, Bridge et al., incl. **Roberts-Borsani**, ApJ, 882, 42, 2019

23. *Newly Discovered Bright* $z \sim 9-10$ *Galaxies and Improved Constraints on Their Prevalence Using the Full CANDELS Area*, Bouwens et al., incl. **Roberts-Borsani**, ApJ, 880, 25, 2019

24. *Near-infrared Spectroscopy of Galaxies During Reionization: Measuring C III] in a Galaxy at z = 7.5*, Hutchison et al., incl. **Roberts-Borsani**, ApJ, 879, 70, 2019

25. *Physical model of near-Earth asteroid (1917) Cuyo from ground-based optical and thermal-IR observations*, Rozek et al., incl. **Roberts-Borsani**, A&A, 627, 172, 2019

26. *The onset of star formation 250 million years after the Big Bang*, Hashimoto et al., incl. **Roberts-Borsani**, Nnature, 557, 392, 2018

27. *xCOLD GASS: The Complete IRAM 30 m Legacy Survey of Molecular Gas for Galaxy Evolution Studies*, Saintonge et al., incl. **Roberts-Borsani**, ApJS, 233, 22, 2017

28. *A Spectroscopic Search for AGN Activity in the Reionization Era*, Laporte, et al., incl. **Roberts-Borsani**, ApJ, 851, 40

29. *Dust in the Reionization Era: ALMA Observations of a z = 8.38 Gravitationally Lensed Galaxy*, Laporte et al., incl. **Roberts-Borsani**, ApJ, 837, 21, 2017

30. *Long-term activity and outburst of comet C/2013 A1 (Siding Spring) from narrow-band photometry and long-slit spectroscopy*, Opitom et al., incl. **Roberts-Borsani**, A&A, 589, 8, 2016

31. *Lymanα Emission from a Luminous z = 8.68 Galaxy: Implications for Galaxies as Tracers of Cosmic Reionization*, Zitrin et al., incl. **Roberts-Borsani**, ApJ, 810, 12, 2015

32. *A Spectroscopic Redshift Measurement for a Luminous Lyman Break Galaxy at z = 7.730 Using Keck/MOSFIRE*, Oesch et al., incl. **Roberts-Borsani**, ApJ, 804, 30, 2015

Submitted Papers

1. *The production of ionizing photons in UV-faint z∼3-7 galaxies*, Prieto-Lyon et al., incl. **Roberts-Borsani**, submitted to A&A

2. *Early results from GLASS-JWST. XVIII: A spectroscopically confirmed protocluster 650 million years after the Big Bang*, Morishita, **Roberts-Borsani** et al., submitted to ApJL

3. *A shot in the Dark (Ages): a faint galaxy at z=9.76 confirmed with JWST*, **Roberts-Borsani** et al., submitted to Nature

4. *Nature and Nurture? Comparing Lyα Detections in UV Bright and Fainter [O III]+Hβ Emitters at z ∼ 8 With Keck/MOSFIRE*, **Roberts-Borsani** et al., submitted to ApJ

5. *Deep ALMA redshift search of a z∼12 GLASS-JWST galaxy candidate*, Bakx et al., incl. **Roberts-Borsani**, submitted to MNRAS

6. *Early results from GLASS-JWST. XI: Stellar masses and mass-to-light ratio of z>7 galaxies*, Santini et al., incl. **Roberts-Borsani**, submitted to ApJL

7. *Early results from GLASS-JWST. IX: First spectroscopic confirmation of low-mass quiescent galaxies at z>2 with NIRISS*, Marchesini et al., incl. **Roberts-Borsani**, submitted to ApJL

8. *The UV luminosity functions of Bright z > 8 Galaxies: Determination from ∼0.41 deg^2 of HST Observations along ∼300 independent sightlines*, Leethochawalit et al., incl. **Roberts-Borsani**, submitted to MNRAS