**Guido Roberts-Borsani**
*Curriculum Vitae*

GENERAL INFORMATION

Department of Physics and Astronomy Phone: +44 (0) 778 414 2797

University College London E-mail: guidowroberts@gmail.com

Gower Street, London, WC1E 6BT Nationality: British/Italian

UK Languages: English, Italian, French, Dutch, Spanish

EDUCATION

2015 – **Ph.D., Astrophysics**

2019 *University College London (London, UK)*

Thesis: “Constraining the prevalence and properties of gas inflows and outflows in normal galaxies in the local Universe”

Secondary work: Constraining detection techniques, roles and properties of luminous galaxies in the early (*z*>7) Universe.

*Supervisors: Dr. Amélie Saintonge, Prof. Richard Ellis*

2010 – **MPhys,** **Astronomy, Space Science & Astrophysics with a year in the USA**

2014 *University of Kent (Canterbury, UK)*

Thesis: “Searching for compositional variation across the surface of the near-Earth asteroid, (1917) Cuyo”

*Supervisor: Dr. Stephen Lowry*

2012 – **MPhys year abroad**

2013 *University of California, San Diego (San Diego, USA)*

Undergraduate project: Monte Carlo simulations of brown dwarf binary populations.

Undergraduate project: Emission type of 20 AGN from Spitzer/IRAC photometry.

*Supervisors: Prof. Adam Burgasser, Dr. Aleks Diamond-Stanic, Dr. Carl Melis*

RESEARCH EXPERIENCE

March 2015 – **Ph.D and Postdoc research**

Sept 2019 *University College London (London, UK)*

Constraining detection methods, redshifts and properties (e.g., ionization sources, dust masses, ages of stellar populations) of high-*z* (*z*>7) galaxies using data from space- (HST, Spitzer) and ground-based (Keck, ESO/VLT, ESO/ALMA) telescopes.

*Supervised by Prof. Richard Ellis (UCL)*

March 2015 – **Ph.D., thesis research**

July 2019*University College London (London, UK)*

Constraining the role and properties of gas outflows in local (*z*<1), normal star-forming galaxies using stacking methods of multiwavelength data sets. Data sets include optical spectra from SDSS DR7 (single spectra) and SDSS-IV/MaNGA (IFU), as well as sub-mm and radio data from xCOLD GASS (single spectra) and ALFALFA (single spectra), respectively. This work is the main focus of the Ph.D. thesis.

*Supervised by Dr. Amélie Saintonge (UCL)*

Oct. 2014 – **Masters research project**

March 2015*Leiden University (Leiden, NL)*

Identifying *z*>7 galaxies in the full HST CANDELS data set using extreme Spitzer/IRAC [3.6]- [4.5] colours and HST photometry. The four brightest candidate galaxies are found at *z*~7-9 and a probablE spectroscopic confirmation at *z*=7.48 with Keck/MOSFIRE.

*Supervised by Dr. Rychard Bouwens (Leiden University)*

June 2014 – **LEAPS Research Intern**

August 2015*European Space Agency (ESTEC)/Leiden University (Noordwijk/Leiden, NL)*

Reducing and analysis IFU spectra for the comet, NIC C/2013 A1 (Siding Spring), using VIS and NIR spectra from ESO’s VLT/X-Shooter. Study performed using the X-Shooter IFU reduction pipeline.

*Supervised by Dr. Aurélie Guilbert-Lepoutre (ESTEC)*

Sept. 2013 – **MPhys research project**

June 2014*University of Kent (Canterbury, UK)*

Searching for compositional variation and YORP fracturing on the near-Earth asteroid (1917) Cuyo in the VIS/NIR bands. This was done using data from the EFOSC2 instrument on the ESO New Technology Telescope. Tasks included reducing the spectra, constructing artificial light curves and shape models of the comet, as well as determining the rotation phase, taxonomic group, and characteristics of the body’s surface.

*Supervised by Dr. Stephen Lowry (University of Kent)*

March 2013 – **Undergraduate research project**

June 2013*University of California, San Diego (San Diego, USA)*

Numerical simulations of local brown dwarf populations to assess binary properties from limited observations. This was done using a Monte Carlo sequence constructed with IDL coding.

*Supervised by Prof. Adam Burgasser (UCSD)*

Jan. 2013 – **Undergraduate research project**

March 2013*University of California, San Diego (San Diego, USA)*

Determining the emission type of 20 local AGN with aperture photometry on Spitzer/IRAC data at 3..6, 4.5, 5.8 and 8.0 microns.

*Supervised by Dr. Aleks Diamond-Stanic (UCSD) and Dr. Carl Melis (UCSD)*

OBSERVING EXPERIENCE & DATA REDUCTION/ANALYSIS

**Optical/NIR spectroscopy:**

3 nights observing in visitor mode with ESO-VLT/X-Shooter: spectroscopic follow up of high-*z*

sources. 3 nights observing in visitor mode with Keck/MOSFIRE: 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, IRAM 30m/EMIR, JCMT/SCUBA-2, NTT/EFOSC2

**Analysis skills:**

Aperture photometry of Spitzer heritage Archive images and CANDELS survey at 3.6, 4.5, 5.8 and

8.0 microns. Spectral analysis of reduced spectra from ESO-NITT/EFOSC2, ESO-VLT/X-Shooter,

ESO-VLT/SINFONI, Keck/MOSFIRE, SDSS DR7, SDSS-IV/MaNGA, ARECIBO/ALFA.

TEACHING/SUPERVISION EXPERIENCE

Summer term **Co-supervision of an undergraduate student**, *Seung Jae Lee (Seoul National*

2018 *University)*.

Using Python and optical IFU spectra from SDSS-IV/MaNGA to determine spaxel galaxy properties (e.g., star-formation, dust, rotational velocity, gas content) and produce spatial maps of these quantities for a sample of star-forming galaxies.

INTERNATIONAL SCHOOLS ATTENDED

Sept. 2015 **IRAM 30m Summerschool**

CONFERENCES & SEMINARS

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.

Sept. 2018 **15th Potsdam Thinkshop (The Role of Feedback in Galaxy Formation), (Potsdam, DE)**

Poster

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.*

October 2017 **Gas in Galaxies conference (Valletta, Malta)**

Talk: *The dichotomy of cold gas inflows and outflows across the SFR\* 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.*

July 2015 **NAM conference (Llandudno, Wales)**

Poster

PRESS RELEASES

May 2018 **BBC/LA Times:** *Scientists detect oxygen legacy of first stars*

<https://bbc.in/2P15gBC>

<https://lat.ms/2xKkh4g>

Related to the paper: T. Hashimoto et al., *Nature, 557, 392*

March 2017 **ESO:** *Ancient Stardust Sheds Light on the First Stars*

<https://bit.ly/2zyGkfN>

Related to the paper: N. Laporte al., *ApJ, 837L, 21*

August 2015 **Space.com/UCL:** *Ancient Galaxy Is Most Distant Ever Found*

<https://bit.ly/2xIxwCN>

<https://bit.ly/2zzoV6B>

Related to the paper: A. Zitrin et al., *ApJ, 810L, 12*

May 2015 **The New York Times:** *Astronomers Measure Distance to Farthest Galaxy Yet*

<https://nyti.ms/2zyGOm7>

Related to the paper: P. Oesch et al., *ApJ, 804L, 30*

OUTREACH

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 Français 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.*

IT SKILLS

**Scientific Software:**

LaTex, DS9, QFitsView, ESO/Gasgano, ESO/Reflex, ESO/X-Shooter pipeline, IRAF, DIPSO, EAZY (Yale), CLASS, EAO reduction software, Overleaf, Keck/MOSFIRE reduction software, pPXF, PyMultinest

**Programming:**

Working knowledge of Python and IDL

LIST OF ACCEPTED TELESCOPE PROPOSALS (AS OF 11/01/2019)

“Can high velocity winds drive molecular outflows in main-sequence galaxies?”

PI : A. Saintonge (ALMA, 2017.1.00601.S)

“Atomic Gas Content of JINGLE Galaxies”

PIs: M. Smith, G. Roberts-Borsani (Arecibo, A3129)

“Nebular Line Emission and Stellar Mass of Bright *z*~8 Galaxies ”Super-Eights”

PI : B. Holwerda (Spitzer, 14049)

“Super-Eight: The brightest *z*~8 Galaxies”

PI : B. Holwerda (Spitzer, 13148)

“The Role of Early Galaxies in Cosmic Reionisation: New Insights from the HST Frontier Fields”

PI : N. Laporte (ESO, 0100.A-0664)

“A systematic spectroscopic survey of the most luminous *z*=8 galaxies in the universe”

PI : I. Labbé (ESO, 096.A-0976)

“Dust Production in the Reionisation Era: Spectroscopic Confirmation of a *z*~8 ALMA Continuum

Detection”

PI : R. Ellis (ESO, DDT, 298.A-5012)

“Spectroscopic Studies of MACS1149+2223 JD1: The Role of Early Luminous Galaxies in Cosmic

Reionisation”

PI : N. Laporte (ESO, 098.A-0534)

“The relation between ionised and molecular gas phases in galactic-scale outflows revealed by

SAMI”

PI : A. Saintonge (IRAM, 176-15)

“[CII] and Dust Emission in the Most Distant Galaxy with a Two-Line Redshift”

PIs : F. Walter & P. Oesch (IRAM, W16EK)

“Enhanced CI in molecular outflow at high redshift”

PI : M. Daprà (IRAM, 191-16)

“Confirmation of the [CII] Emission Line from an Ultra-Luminous Source in the Heart of Cosmic

Reionization”

PIs : P. Oesch & F. Walter (IRAM, W17FB)

“The ionised gas and dust around an AGN at the epoch of reionization”

PIs : F. Boone & N. Laporte (IRAM, S18DQ)

“Preparing for JWST through Constraints on the Bright End of the *z*~9 LF from CANDELS”

PI : R. Bouwens (HST, 14459)

“Super-Eight: The brightest *z*~8 Galaxies”

PI : B. Holwerda (HST, 14652)

“Beacons in the dark: using the most distant galaxies to probe cosmic reionization”

PI : S. De Barros (HST, 15103)