Curriculum Vitae of Jasleen Matharu

CONTACT INFORMATION

Department of Physics & Astronomy
Texas A&M University
College Station, Texas, 77843-4242
USA

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Website

RESEARCH INTERESTS

Galaxy Evolution, Galaxy Clusters, High-Redshift Galaxies, Star Formation, Quenching, Galaxy Growth, Cosmic Reionisation

COMPUTER LANGUAGES

Python, Object Orientated Programming, bash, git, LaTeX, HTML, Markdown, reStructuredText

SPECIALISED SKILLS

- *Grism redshift and line analysis software* (Grizli) – Creator, Author and Editor of "Grizli for Dummies", an unofficial guide to using Grizli.
- GALFIT

EDUCATION

Institute of Astronomy, University of Cambridge, Cambridgeshire, UK

Ph.D., Astronomy, October 2015 - July 2019, *Awarded:* 30th November 2019

- Thesis Title: *A Study on Quenching and Galaxy Growth in* $z \sim 1$ *Clusters using HST WFC3 Grism Observations*
- Primary Supervisor: Dr. Adam Muzzin
- Primary Supervisor (Cambridge): Prof. Paul C. Hewett
- Secondary Supervisor (Cambridge): Dr. Matthew Auger

University College London (UCL), Gower Street, London, UK

M.Sci., Astrophysics (First Class Honours), September 2011 - August 2015

- Masters Project: *Testing Cosmic Microwave Background Delensing*
- Primary Supervisor (nominal): Prof Hiranya Peiris
- Secondary Supervisor: Dr Aurélien Benoit-Lévy

PROFESIONAL APPOINTMENTS

Postdoctoral Research Associate September 2019 - present
Department of Physics & Astronomy,
Texas A&M University
Supervisors: Prof. Casey Papovich & Prof. Robert Kennicutt
Topic: Formation and Evolution of Galaxies and Cosmic Reionisation

PROFESSIONAL EXPERIENCE

Referee for *Astronomy & Astrophysics*	2020-
Referee for *Monthly Notices of the Royal Astronomical Society*	2021-
Referee for *The Astrophysical Journal*	2021-
Referee for *Gemini* observing proposals	2021B
External Reviewer for *Hubble Space Telescope* observing proposals	Cycle 29
Reviewer for ALMA observing proposals	Cycle 8

PUBLICATION STATISTICS

Last updated 26th September 2021:

- Refereed first author publications: 3, total citations: 31
- Refereed total publications: 8, total citations: 92
- H-index: 6

Refereed Journal Publications

1. **Matharu, J.**, Muzzin, A., Brammer, G.B., Nelson, E.J., Auger, A.W., Hewett, P.C., van der Burg, R.F.J., Balogh, M., Demarco, R., Marchesini, D., Noble, A.G., Rudnick, G., van der Wel, A., Wilson, G. and Yee, H.K.C. 2021, "HST/WFC3 grism observations of $z \sim 1$ clusters: Evidence for rapid outside-in environmental quenching from spatially resolved H-Alpha maps". Accepted for Publication in *The Astrophysical Journal*. arXiv:2109.06186.

2. Simons, R.C, Papovich, C., Momcheva, I., Trump, J.R., Brammer, G.B., Estrada-Carpenter., V., Backhaus, B.E., Cleri, N. J., Finklestein, S.L., Giavalisco, M., Ji, Z., Jung, I., **Matharu, J.** and Weiner, B. 2020, "CLEAR: The Gas-Phase Metallicity Gradients of Star-Forming Galaxies at $0.6 < z < 2.6$". Accepted for Publication in *The Astrophysical Journal*, arXiv:2011.03553.

3. Balogh, M., van der Burg, R.F.J., Muzzin, A., Rudnick, G., Wilson, G., Webb, K., Biviano, A., Boak, K., Cerulo, P., Chan, J.C.C., Cooper, M.C., Gilbank, D.G., Gwyn, S., Lidman, C., **Matharu, J.**, McGee, S.L., Old, L., Pintos-Castro, I., Reeves, A.M.M., Shipley, H., Vulcani, B., Yee, H.K.C., Alonso, M.V., Bellhouse, C., Cooke, K.C., Davidson, A., De Lucia, G., Demarco, R., Drakos, N., Fillingham, S.P., Finoguenov, A., Forrest, B., Golledge, C., Jablonka, P., Garcia, D.L., McNab, K., Muriel, H., Nantais, J.B., Noble, A., Parker, L.C., Petter, G., Poggianti, B.M., Townsend, M., Valotto, C., Webb, T., and Zaritsky, D. 2021, "The GOGREEN and GCLASS Surveys: First Data Release". Published in *Monthly Notices of the Royal Astronomical Society*, Volume 500, Issue 1, Pages 358–387.

4. Ni, Q., Brandt, W. N., Yang, G., Leja, J., Chen, C. -T. J., Luo, B., **Matharu, J.**, Sun, M., Vito, F., Xue, Y. Q., Zhang, K., 2020, "Revealing the relation between black-hole growth and host-galaxy compactness among star-forming galaxies". Accepted for Publication in *Monthly Notices of the Royal Astronomical Society*, arXiv: 2007.04987.

5. Estrada-Carpenter, V., Papovich, C., Momcheva, I., Brammer, G.B., Simons, R., Bridge, J., Cleri, N., Ferguson, H., Finklestein, S.L., Giavalisco, M., Jung, I., **Matharu, J.**, Trump, J. and Weiner, B. 2020, "CLEAR II: Evidence for Early Formation of the Most Compact Quiescent Galaxies at High Redshift". Published in *The Astrophysical Journal*, Volume 898, Issue 2, article id. 171.

6. **Matharu, J.**, Muzzin, A., Brammer, G.B., van der Burg, R.F.J., Auger, M.W., Hewett, P.C., van der Wel, A., van Dokkum, P., Chan, J.C.C., Demarco, R., Marchesini, D., Nelson, E.J., Noble, A.G. and Wilson, G. 2020, "HST/WFC3 grism observations of $z \sim 1$ clusters: evidence for evolution in the mass–size relation of quiescent galaxies from poststarburst galaxies". Published in *Monthly Notices of the Royal Astronomical Society*, Volume 493, Issue 4, Pages 6011–6032.

7. **Matharu, J.**, Muzzin, A., Brammer, G.B., van der Burg, R.F.J., Auger, M.W., Hewett, P.C., van der Wel, A., van Dokkum, P., Balogh, M., Chan, J.C.C., Demarco, R., Marchesini, D., Nelson, E.J., Noble, A.G., Wilson, G. and Yee, H.K.C. 2019, "HST/WFC3 grism observations of $z \sim 1$ clusters: The cluster versus field stellar mass–size relation and evidence for size growth of quiescent galaxies from minor mergers". Published in *Monthly Notices of the Royal Astronomical Society*, Volume 484, Issue 1, Pages 595–617.

8. Noble, A.G., Muzzin, A., McDonald, M., Rudnick, G., **Matharu, J.**, Cooper, M.C., Demarco, R., Lidman, C., Nantais, J., van Kampen, E., Webb, T.M.A., Wilson, G. and Yee, H.K.C. 2019, "Resolving CO(2-1) in $z \sim 1.6$ Gas-Rich Cluster Galaxies with ALMA: Rotating Molecular Gas Disks with Possible Signatures of Gas Stripping". Published in *The Astrophysical Journal*, Volume 870, Issue 2, article id. 56.

SOFTWARE JOURNAL PUBLICATIONS

Total citations: 2

1. Brammer, Gabe and **Matharu, Jasleen**, 2021. "Grizli: Release 2021". Published on Zenodo. DOI: 10.5281/zenodo.1146904.

SUBMITTED JOURNAL PUBLICATIONS

Total citations: 6

1. Cleri, N. J., Trump, J.R., Backhaus, B.E., Momcheva, I., Papovich, C., Simons, R.C., Weiner, B., Estrada-Carpenter., V., Finklestein, S.L., Giavalisco, M., Ji, Z., Jung, I., **Matharu, J.**, Martinez, F. III. and Sturm, M.R. 2020, "CLEAR: Paschen-Beta Star Formation Rates and Dust Attenuation of Low Redshift Galaxies". Submitted to *The Astrophysical Journal*. arXiv:2009.00617.
2. Backhaus, B.E., Trump, J.R., Cleri, N. J., Simons, R.C, Papovich, C., Momcheva, I., Estrada-Carpenter., V., Finklestein, S.L., **Matharu, J.**, Ji, Z., Weiner, B., Giavalisco, M. and Jung, I. 2021, "CLEAR: Emission Line Ratios at Cosmic High Noon". Submitted to *The Astrophysical Journal*, arXiv:2109.08147.

JOURNAL PUBLICATIONS IN PREPARATION

1. **Matharu, J.**, Papovich, C., Momcheva, I., Simons, R.C., Brammer, G.B., Ji, Z., Giavalisco, M., Weiner, B. Estrada-Carpenter., V., Backhaus, B.E., Cleri, N. J., Finklestein, S.L. and Jung, I. 2021 "CLEAR: The evolution of spatially resolved star formation between $0.5 < z < 1.7$ from spatially resolved H-Alpha maps". Being prepared for publication in *The Astrophysical Journal*.

PRESENTATIONS

- **[COVID-19]** Seminar, *Revealing how Galaxy Growth, Star Formation and Quenching proceed in High Redshift Galaxies with Spatially Resolved Space-based Slitless Spectroscopy*, University of Nottingham, UK. 29th Sep 2021
- **[COVID-19]** Extragalactic Group Seminar, *Revealing how Galaxy Growth, Star Formation and Quenching proceed in High Redshift Galaxies with Spatially Resolved Space-based Slitless Spectroscopy*, University of Edinburgh, UK. 21st Sep 2021
- **[COVID-19][Invited Colloquium given in-person]** Steward Observatory/NSF NOIR Lab Colloquium, *Revealing how Galaxy Growth, Star Formation and Quenching proceed in High Redshift Galaxies with Spatially Resolved Space-based Slitless Spectroscopy*, University of Arizona, Tucson, Arizona, USA. 16th Sep 2021
- **[COVID-19]** School of Physical Sciences Seminar, *Revealing how Galaxy Growth, Star Formation and Quenching proceed in High Redshift Galaxies with Spatially Resolved Space-based Slitless Spectroscopy*, The Open University, Milton Keynes, UK. 9th Sep 2021
- **[COVID-19][Contributed]** Galaxy Cluster Formation II Workshop, *The Role of Galaxy Clusters in Shaping the Size Growth and Quenching of Galaxies*, European Southern Observatory, Garching, Germany and Harvard-Smithsonian Centre for Astrophysics, Cambridge, USA. 17th Jun 2021

- **[COVID-19][Contributed]** Multi-Object Spectroscopy for Statistical Measures of Galaxy Evolution Workshop, *Spatially resolved star formation in different environments between* $0.5 < z < 1.7$ *with HST WFC3 slitless spectroscopy*, Space Telescope Science Institute, Baltimore, USA. 18th May 2021
- **[COVID-19][Invited]** Joint Nuclear and Astrophysics Seminar, *Tracing star formation in galaxies using spatially resolved H-Alpha emission line maps*, Texas A&M University, College Station, TX, USA. 26th Feb 2021
- **[COVID-19][Invited]** Extragalactic/Cosmology Seminar, *The Role of Galaxy Clusters in Shaping the Size Growth and Quenching of Galaxies*, University of Texas at Austin, TX, USA. 25th Jan 2021
- **[COVID-19][Contributed]** 237th Meeting of the American Astronomical Society, *The Role of Galaxy Clusters in Shaping the Size Growth and Quenching of Galaxies*, virtually anywhere. 15th Jan 2021
- **[COVID-19]** Mitchell Institute Seminar, *The Role of Galaxy Clusters in Shaping the Size Growth and Quenching of Galaxies*, Mitchell Institute for Fundamental Physics and Astronomy, Texas A&M University, College Station, TX, USA. 21st Sep 2020
- **[COVID-19]** Texas A&M Astrosymposium, *New results from spatially resolved studies with space-based slitless spectroscopy*, Mitchell Institute for Fundamental Physics and Astronomy, Texas A&M University, College Station, TX, USA. 17th Aug 2020
- **[COVID-19]** Lunch talk, *The cluster vs. field stellar mass–size relation at* $z \sim 1$*: implications for galaxy size growth and quenching*, Space Telescope Science Institute, Baltimore, USA. 31st Jul 2020
- **[COVID-19][Contributed]** European Astronomical Society Annual Meeting 2020: Quenching cluster galaxies in the cosmic middle ages, *The cluster vs. field stellar mass–size relation at* $z \sim 1$*: implications for galaxy size growth and quenching*, Leiden, The Netherlands (virtual conference). 1st Jul 2020
- **[Contributed]** Aspen Winter Conference: Galaxy Quenching and Transformation Throughout Cosmic Time, *The cluster vs. field stellar mass–size relation at* $z \sim 1$*: implications for galaxy size growth and quenching*, Aspen Center for Physics, Aspen, Colorado, USA 10th Feb 2020
- Extragalactic Lunch, *Understanding Environmental Quenching at High-redshift*, Mitchell Institute for Fundamental Physics and Astronomy, Texas A&M University, College Station, TX, USA. Oct 2019
- CLEAR Collaboration meeting, *The cluster vs. field stellar mass–size relation at* $z \sim 1$*: implications for galaxy size growth and quenching*, Space Telescope Science Institute, Baltimore, USA. Jun 2019
- Dunlap tea, *The cluster vs. field stellar mass–size relation at* $z \sim 1$*: implications for galaxy size growth with decreasing redshift*, Dunlap Institute for Astronomy & Astrophysics, University of Toronto, Canada. Oct 2018
- Astrophysics Brown Bag Lunch talk, *The cluster vs. field stellar mass–size relation at* $z \sim 1$*: implications for galaxy size growth with decreasing redshift*, MIT Kavli Institute for Astrophysics and Space Research, Cambridge, USA. Oct 2018
- Lars Hernquist's group meeting, *The cluster vs. field stellar mass–size relation at* $z \sim 1$*: implications for galaxy size growth with decreasing redshift*, Harvard-Smithsonian Center for Astrophysics, Cambridge, USA. Oct 2018
- ITC Lunch, *The cluster vs. field stellar mass–size relation at* $z \sim 1$*: implications for galaxy size growth with decreasing redshift*, Institute for Theory and

Computation, Harvard-Smithsonian Center for Astrophysics, Cambridge, USA. Oct 2018
- Lunch talk, *The cluster vs. field stellar mass–size relation at $z \sim 1$: implications for galaxy size growth with decreasing redshift*, Yale University, New Haven, USA. Oct 2018
- Lunch talk, *The cluster vs. field stellar mass–size relation at $z \sim 1$: implications for galaxy size growth with decreasing redshift*, Space Telescope Science Institute, Baltimore, USA. Oct 2018
- Lunch talk, *The cluster vs. field stellar mass–size relation at $z \sim 1$: implications for galaxy size growth with decreasing redshift*, University of Nottingham, Nottingham, UK. Sep 2018
- Lunch talk, *The cluster vs. field stellar mass–size relation at $z \sim 1$: implications for galaxy size growth with decreasing redshift*, Leiden Observatory, Leiden, Netherlands. Sep 2018
- Poster, *Galaxy Evolution & the Mass–Size Relation in $z \sim 1$ Clusters*, Galaxy Evolution Across Time, proceedings of a conference held in Paris, France. Jun 2017
- Seminar, *The shut down of star formation in galaxies at $z \sim 1$: obtaining direct evidence for its environmental dependence*, Institute of Astronomy, Cambridge, UK. Feb 2017

Observing Proposals

- **Co-I** (PI: Finkelstein), James Webb Space Telescope Cycle 1 GO Proposal #2079: *"The Webb Deep Extragalactic Exploratory Public (WDEEP) Survey: Feedback in Low-Mass Galaxies from Cosmic Dawn to Dusk"*
- **Co-I** (PI: Noble), Hubble Space Telescope Cycle 28 GO Proposal #16300: *"Toward a Spatially-resolved Kennicutt-Schmidt Law in High-redshift Cluster Galaxies: the Interplay Between Molecular Gas, Star Formation, and Stellar Mass with ALMA and HST"*
- **Co-I** (PI: Simons), Hubble Space Telescope Cycle 28 Archival & Theoretical Research Proposal #16151: *"On The Rapid Evolution of Galaxy Metallicity Gradients: A Bridge Between Theory and Observations"*
- **Co-I** (PI: Muzzin), 20.00 hrs, Gemini-North Telescope Proposal GN-2020A-Q-214: *"Towards a Deeper Understanding of Galaxy Quenching: First Measurement of the Stellar Kinematics of Poststarburst Galaxies in Clusters at $z \sim 1$"*

Observing Experience

Roque de los Muchachos Observatory, William Herschel Telescope (WHT)
- PAUCam, assisted Nina Hatch 5 nights

Awards

- Churchill College Travel Grant Award, Talks Tour to present PhD work, Nottingham (UK), Leiden (The Netherlands), Baltimore, New Haven and Cambridge (USA) and Toronto (Canada) Oct 2018
- Churchill College Travel Grant Award, Conference on Galaxy Evolution Across Time, Paris (France) May 2017
- Science and Technology Facilities Council (STFC) Quota Award to undertake research in Astrophysics at the Institute of Astronomy, Cambridge for up to 3.5 years Oct 2015

Undergraduate supervision

Maths IA Supervisor, Churchill College Academic year 2016–17

Weekly two-on-one and one-on-one teaching of undergraduate students in

their first year mathematics course.

OUTREACH

[COVID-19] College Station, Texas May 2020
- Astronomy on Tap Bryan/College Station Virtual Edition #24: 25 minute talk on "Our Place in the Universe", livestreamed on YouTube.

Institute of Astronomy, University of Cambridge Jul 2018
- Gave two lectures on the topic of "Our Place in the Universe" and the workings of the the Northumberland Telescope to two groups of local and overseas students aged between 13 - 14 and 15 - 18.

Institute of Astronomy, University of Cambridge Mar 2016
- Organised an activity for the Cambridge Science Festival where by children can "build" a galaxy.

SERVICE

[COVID-19] Astronomy Postdoc Representative Apr 2021 -
- Attend Faculty meetings as a representative for the Astronomy Postdocs.
- Delegate tasks and responsibilities amongst the Astronomy Postdocs.

[COVID-19] Lead organiser of Texas A&M University's Astrosymposium 2020
Jun 2020 – Aug 2020
- Prepared the schedule for the all-day virtual conference.
- Moderated and supported other organisers during the virtual conference.

[COVID-19] Creator, Author and Editor of "Grizli for Dummies"– an unofficial guide to using Grizli
- Unofficial guide to using Grizli that is part of the official Grizli documentation.
- Open source such that other users can contribute to it, since Grizli is in active development.

Co-Chair of Central Texas James Webb Space Telescope (JWST) Workshops Comittee Nov 2019 – Feb 2020
- Remotely attended a week-long Masterclass on the James Webb Space Telescope (JWST) at the Space Telescope Science Institute (StScI).
- Co-organised two all-day JWST Proposal Planning Workshops with hands-on exercises at UT Austin and Texas A&M University.