Overview of the Research Project

1. Title of the research project:
The gas depletion timescale of star-forming galaxies over cosmic time

2. Research Category: Science

3. Academic level of research project:
Doctoral

4. Primary supervisor's details:

a. **Full name of primary supervisor:** Assoc. Prof. Sarah Blyth
b. **Email address:** sarah.blyth@uct.ac.za
c. **University:** University of Cape Town

5. Co-supervisor's details:

a. **Full name of co-supervisor:** Dr Rosalind Skelton
b. **Institution** South African Astronomical Observatory

Please note that *both* supervisors will be responsible for supervising the student's research.

6. Abstract of research:

The star formation rate density of the universe has dropped by almost two orders of magnitude over the past ~10 billion years of cosmic time. An approach to investigating this decrease is to probe the evolution of the neutral hydrogen gas, HI, content of galaxies over cosmic time since HI provides the gas reservoir from which stars eventually form in galaxies. Recent results from HI stacking measurements by Chowdhury et al. (2022) of the HI depletion timescales of star-forming galaxies at $0.74< z< 1.45$, using deep observations on the GMRT, imply that gas accretion at $z\sim1$ is not efficient enough to maintain the HI reservoirs of massive galaxies and is likely the cause of the drop in star formation rate density.
The goal of this proposed project will be to use data from the LADUMA Large Survey Project on MeerKAT to measure the gas depletion timescales of star forming galaxies over 9 billion years of cosmic history ($z<1.45$) using a combination of L-band and UHF-band data from LADUMA. This will also enable an independent comparison with the high-redshift results by Chowdhury et al.(2022).

Details of Research Project

1. Scientific merit and link to SARAO research priority areas:
Over the past ~10 billion years of cosmic time, the star formation rate density of the universe has dropped by almost two orders of magnitude (Madau & Dickinson, 2014); galaxies today are forming stars at only a fraction of the rate they were ~10 billion years ago. In order to better understand why we observe this phenomenon, we need to understand how the hydrogen gas, the fuel for star formation in galaxies, is evolving over cosmic time. Neutral atomic hydrogen, HI, which provides the reservoir from which molecular hydrogen, and eventually stars, can form, dominates the mass fraction of the interstellar medium (ISM) of galaxies and is detectable through its 21cm spin-flip transition by radio telescopes.

Recently, Chowdhury et al. (2022) used HI stacking to measure the average HI masses and the HI depletion timescales of star-forming galaxies at $0.74 < z < 1.45$ using deep observations on the GMRT. They found that the most massive galaxies ($\log(M^*)\sim10 M_\odot$) which dominate the star formation rate density at those redshifts have very short HI depletion timescales of less than 1 billion years. This would imply that they would need very high gas accretion rates to enable them to continue forming stars at their current rate. However Chowdhury et al. (2022) found that the average HI masses of galaxies with stellar masses of $\log(M^*/M_\odot)\sim10$, decrease by a factor of ~3.2 from $z\sim1.3$ to $z\sim1$ which implies that accretion at that epoch is not efficient enough to maintain the HI reservoirs of massive galaxies and is likely the cause of the drop in star formation rate density.

The LADUMA Large Survey Project on MeerKAT is a deep HI survey encompassing the Extended Chandra Deep Field South. The survey is using a combination of L-band and UHF-band observations on MeerKAT to probe the HI emission from galaxies over the last ~9 billion years of cosmic time ($0<z<1.4$). Preliminary investigations of the gas depletion timescales for star forming galaxies in the redshift range $0<z<0.56$ are currently in progress using the first internal release of LADUMA L-band data (Featherstone et al., *in prep)*. Outcomes from this work have illustrated the dependence of the measured gas depletion timescales on various systematics including the choice of star-formation rate indicator and the method of estimating the average depletion timescale over the galaxy sample.

The goal of this new proposed project will be to use the deeper LADUMA data to measure the gas depletion timescales at $z\sim0.3$-1.45 using a combination of L-band and UHF-band data from LADUMA. This will enable comparison with the results by Chowdhury et al., as well as providing a high redshift comparison to the intermediate redshift LADUMA results. An advantage here is that the systematics for the intermediate and high redshift LADUMA analyses will be very similar, since the radio data are from the same survey on MeerKAT and the same ancillary data catalogues can be used to determine the star formation rates in the same way. This means that the higher redshift LADUMA results will be directly comparable, with similar systematics, methodology, etc., to the lower redshift results, and should enable a more nuanced investigation of the evolution of the gas depletion in galaxies since $z\sim1.4$. It will also be of interest to investigate the gas depletion time scales of galaxies in different environments within the LADUMA field given that environment is one of the key drivers of galaxy evolution processes.

The project will use HI stacking techniques, supported by LADUMA's existing large spectroscopic redshift catalogue and sample selection will be achieved based on the multi-wavelength photometric catalogues in hand for the LADUMA field.

This project falls under the **highest priority area: MeerKAT** for science as listed in the application guide. The project will utilise L-band and UHF-band radio data which is already in hand from the LADUMA Large Survey Project on MeerKAT to measure the gas depletion timescales of a sample of galaxies at intermediate redshift. This project primary supervisor is one of the co-PIs of the LADUMA survey.

2. Feasibility:

Data availability and analysis techniques:
The project will rely on the HI stacking technique whereby galaxies are identified in optical catalogues, their spectra are extracted from the HI data cubes (detections and non-detections) and are stacked based on their redshifts (measured optically). This is a very useful technique in cases where the signal-to-noise ratio is too poor to directly detect individual galaxies and the HI properties of galaxy samples can then be measured on average. The student will use the HI stacking software developed by LADUMA team members (e.g., Healy et al. 2019).

3. Data and equipment

The data required for this project are already in hand: the project will use existing LADUMA data. LADUMA's large spectroscopic redshift catalogue consists of thousands of redshifts compiled from both publicly available spectroscopy as well as proprietary LADUMA redshifts from the team's own campaigns. These will be used for the stacking measurements and determination of environmental density. In addition, substantial multi-wavelength photometry already exists and is available for galaxies in the LADUMA field and these data will be used to determine the sample selection for stacking as well as the star formation rates of the stacked galaxies.

As a LADUMA team member, the student will have access to the IDIA/ilifu cloud computing facilities where the LADUMA data will be processed and analysed. Being at UCT will enable the student to interact with IDIA researchers and technical experts who will be able to help support the computing aspects. As a student in the Department of Astronomy, the student will also have access to the usual desk and office space, internet access and library access afforded to all postgraduate students.

4. High-level breakdown of activities

- In-depth literature review (2026)
- Investigate preferred stacking methods based on latest stacking results from LADUMA and the literature (2026)
- Test stacking methods on UHF data and L-band data (2026)
- Identify star-forming galaxy samples over the identified redshift ranges to be investigated using photometric catalogues (2026)
- Perform HI stacking analysis and analyse results as a function of redshift(2026-2027)
- Investigate the effects of environment on gas depletion timescales (2027-2028)
- Write up thesis (2028)

5. Skills/experience useful to the student on this project:

Excellent python programming skills will be needed. High-level understanding of radio interferometry and experience in analyzing and working with HI data cubes will be an advantage.

The data proposed to be used for this project will come from the data already in hand from the LADUMA Large Survey Project on MeerKAT.

Sarah Blyth
LADUMA co-PI
28 February 2025

Curriculum Vitae : SARAH-LOUISE BLYTH

Contact Information

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Department of Astronomy
University of Cape Town
Rondebosch, Cape Town, 7701, South Africa

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Cell: +27 78 541 2969
E-mail: sarah.blyth@uct.ac.za

Research Interests

Galaxy evolution, radio astronomy (H I), large scale structure, Physics/Astronomy education

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Education

Ph.D. in High Energy Nuclear Physics, University of Cape Town, South Africa (2007)

(Hosted at Lawrence Berkeley National Laboratory, California, USA)
Thesis title: "Using the ϕ-meson to probe the medium created in Au+Au collisions at RHIC"

M.Sc. (*with distinction*) in High Energy Nuclear Physics, University of Cape Town, South Africa (2004)
(Hosted at Lawrence Berkeley National Laboratory, California, USA)
Thesis title: "Jet Study in Ultra-Relativistic Heavy-Ion Collisions with the ALICE Detector at the LHC"

BSc. (Hons) in Theoretical Physics, University of Cape Town, South Africa (1999)

BSc. in Physics and Astrophysics (*with distinction in Physics & the degree*), University of Cape Town, South Africa (1998)

Awards & Leadership Positions

– Head of Department of Astronomy, University of Cape Town
– Co-Director National Astrophysics and Space Science Programme (NASSP), UCT-node (2018 - 2021) and (mid-2023 - present)
– Co-Chair of SKA HI Science Working Group (2018 - 2021, international invited position)
– Co-PI of LADUMA survey on MeerKAT (2009 - present)
– Chair of SARAO Users' Committee (2021 - 2023, member since 2018, national invited position)
– Member of the Pathfinder HI Coordination Committee (PHISCC) (2010 - present)
– Member of the Inter-University Institute for Data Intensive Astronomy (IDIA) Management Committee (2018 - 2021, and 2023 - present, invited University position)
– NRF C2 rating
– RHIC & AGS Thesis award for an outstanding thesis related to research conducted at the RHIC or AGS complex (2008)
– NRF Innovation Postdoctoral Fellowship (2008)
– Junior Representative on STAR Experiment Council (2006-2007)

Academic Experience

University of Cape Town, Cape Town, South Africa
(2024 -) Head of Department of Astronomy, University of Cape Town
(Jul 2023 - Dec 2023) Acting Head of Department of Astronomy, University of Cape Town
(2020 -) Associate Professor, Department of Astronomy, University of Cape Town
(2017 - July 2023) Deputy Head of Department
(2018 - 2021) & (mid-2023 -) Co-Director National Astrophysics and Space Science Programme - UCT

node
(2016 - 2020) Senior Lecturer
(2009 - 2015) Lecturer
(2008) NRF Innovation Postdoctoral Fellow in Astronomy
(mid-end 2007) Postdoctoral Fellow in Astronomy (departmentally funded)

Lawrence Berkeley National Laboratory, Berkeley, California, USA
(2005 - 2006) Visiting Scholar (during PhD work)

Other Work Experience

(Aug 2001 - Dec 2002) *Management Consultant*, Pyxis Capital Management
(Mar 2000 - Jun 2001) *Business Analyst*, MarchFIRST

Absences

Maternity leave (October 2009 - January 2010)
Maternity leave (June 2012 - October 2012)

Supervision

Doctoral

Munira Hoosain, *co-supervised* (2021 -) (SARAO-funded)
Nadine Hank, *co-supervised* (2021 -) (University of Groningen)
Nazir Makda, *co-supervised* (2019 -)
Gerald Balekaki, *co-supervised*, (2016 -) (Computer science)
Tshiamiso Makwela, *co-supervised*, graduated 2022
Narges Hatamkhani, *co-supervised*, graduated 2022
Julia Healy, *co-supervised*, graduated 2021 (SARAO-funded, Joint degree UCT / University of Groningen)
Jamie Bok, *co-supervised*, (Upgraded from MSc.) graduated 2021
Tom Mutabazi, *supervised*, (upgraded from MSc.), graduated June 2015, (SKA-funded)

Masters

Lara Featherstone (SARAO-funded), *co-supervised*, (Jan 2024 -)
Tilman Oelgeschläger, *co-supervised*, (August 2022 -)
Munira Hoosain, *co-supervised*, (graduated 2022)
Nadine Hank (SARAO-funded), *supervised*, (graduated 2021)
Nazir Makda, *co-supervised*, (graduated 2020)
Julia Healy (SKA-funded), *supervised*, (graduated June 2017)
Scott Badenhorst, *co-supervised*, (graduated June 2015)
Christopher Schollar, *supervised*, (graduated June 2015)
Riona Ramraj, *co-supervised*, (graduated 2014)
Zara-Nomena Randriamanakoto, *co-supervised*, (graduated 2010)

Honours

1 Astronomy Hons student (Nadine Hank, 2017)
7 (previous) jointly supervised Computer Science Hons students

Postdoctoral

Abhisek Mohapatra, Postdoctoral Fellow on SARAO-UCT group grant (Jan 2024 -)
Jacinta Delhaize, SKA Postdoctoral Fellow (Aug 2018 - Jan 2022)
Natasha Maddox, SKA Postdoctoral Fellow (Aug 2011 - Jul 2014)

Successful Funding Proposals

Research funding

- NRF Competitive Support for Rated Researchers, R 792 800 (2021)
- UCT URC Travel Grant, R 14k (2018)
- NWO / NRF Cooperation Programme for HI Surveys (*SA PI*), R450k (*+ €15k p.a. NL*) (2017-2019)
- NRF Incentive funding, R40k p.a. (2016 - 2018)
- NWO / NRF Cooperation Programme for HI Surveys (*SA PI*), R450k (*+ €15k p.a. NL*) (2013-2016)
- NRF Multi-Wavelength Astronomy Research Programme, R127k (2015)
- URC Visiting Scholars Fund, R23k (2015)
- NRF Competitive Support for Unrated Researchers, R341k (2015-2017)
- UCT URC Travel Grant, R26k (2014)
- SKA-SA Mobility Grant, R10k (2014)

Teaching funding

- SARAO Block Grant, R720k (2024), *(undergraduate student bursaries)*
- SARAO Block Grant, R692k (2023), *(undergraduate student bursaries)*
- SARAO Block Grant, R774k (2020), *(undergraduate student bursaries)*
- SARAO Block Grant, R725k (2019), *(undergraduate student bursaries)*

Meeting Organisation

SOC, "IAU Symposium 392: Neutral Hydrogen in and around Galaxies in the SKA Era", Cape Town, South Africa, August 2024
SOC, "2023 PHISCC Workshop, HI Surveys in full swing", Cape Town, South Africa, March 2023
SOC, "A Precursor View of the SKA Sky", SKA Observatory Virtual Conference, March 2021
SOC, "2020 PHISCC Workshop", to be held in Cagliari, Italy May 2020, postponed due to Covid-19
SOC, "SKA General Science Meeting and Key Science Workshop 2019", Manchester, UK, April 2019
SOC, "SKA/SARAO Bursary Conference", Cape Town, South Africa, 2016, '17, '18, '19, '20, '21, '22, '23
LOC + SOC, "2016 PHISCC Workshop: Upgrading our HI Toolkit", Cape Town, South Africa, February 2016
LOC (Lead), Fourth LADUMA Team Meeting, Cape Town, South Africa, February 2016
SOC, "2015 PHISCC Workshop: HI Surveys Get Real, Rutgers", NJ, USA, March 2015
SOC, "Life-cycle of gas in galaxies: A local perspective" meeting, ASTRON, NL, August 2015
LOC + SOC, "5th Pathfinder HI Science Coordination Committee (PHISCC) Workshop", Cape Town, South Africa, January 2012
LOC (Lead), First LADUMA Team Meeting, Cape Town, South Africa, January 2012

Recent Conference Talks

Recent results from LADUMA, contributed talk at MeerKAT@5 Conference, Stellenbosch, February, 2024

LADUMA: Looking At the Distant Universe with the MeerKAT Array, talk presented at PHISCC: HI Surveys in Full Swing, Cape Town, March 2023

Probing Galaxy Merger Activity Via HI Asymmetries, short talk at MIAPP 2-week residential invited meeting on *Galaxy Evolution in a New Era of HI Surveys*, Garching, Germany, August 2019

Future high redshift observations of HI kinematics, invited talk at the Focus Meeting on Galactic Angular Momentum, IAU General Assembly, Vienna, August 2018

LADUMA: Looking at the Distant Universe with the MeerKAT Array, contributed talk at 11th Pathfinder

HI Science Coordination Committee Workshop, Pingtang, China, June 2018

Recent Public Talks

The Science of Galaxies with MeerKAT, UCT Summer School lecture (2023)

Looking at Galaxies with Radio Eyes, talk to Grades 3-6 learners at International School of Cape Town, Cape Town (2023)

From the Dark Side of the Moon to Black Holes, UCT Summer School lecture (2020)

Looking at Galaxies with Radio Eyes, lecture to Astronomical Society of Southern Africa (2019)

The Solar System, talk to Grades 4-7 learners at Forres Preparatory School, Cape Town (2019)

LADUMA: Looking at the Distant Universe with the MeerKAT Array, lecture at ASSA Symposium (2018)

From MeerKAT to the SKA, lecture to Friends of the Hout Bay Museum (2018)

Publications

Astronomy & Astronomy Education:
First author means highest contribution and primary author. For student papers, the student is typically listed first and the supervisors directly afterwards.

The K_s-band luminosity function of the rich cluster VC04 in the Vela supercluster, N. Hatamkhani, R.C. Kraan-Korteweg, S.-L. Blyth, R.E. Skelton, ApJ, Volume 972 (2024)

MHONGOOSE: A MeerKAT nearby galaxy H I survey, W.J.G. de Blok, et al., A&A Volume 688, A109 (2024)

The effect of cosmic web filaments on galaxy properties in the RESOLVE and ECO surveys, M. Hoosain, S-L. Blyth, R.E. Skelton, S.J. Kannappan, D.V. Stark, K.D. Eckert, Z.L. Hutchens, D.S. Carr, K. Kraljic, MNRAS, Volume 528, Issue 3, pp.4139-4159 (2024)

Measuring galaxy asymmetries in 3D, N. Deg, M. Perron-Cormier, K. Spekkens, M. Glowacki, S.-L. Blyth, N. Hank, MNRAS, Volume 523, Issue 3, pp.4340-4352 (2023)

Galaxy clusters in the Vela Supercluster - I: Deep NIR Catalogues, N. Hatamkhani, R.C. Kraan-Korteweg, S.L. Blyth, K. Said, A. Elagali, MNRAS, Volume 522, Issue 2, pp.2223-2240 (2023)

ASymba: H I global profile asymmetries in the SIMBA simulation, M. Glowacki, N. Deg, S.-L. Blyth, N. Hank, R. Davé, E. Elson, K. Spekkens, MNRAS, Volume 517, Issue 1, pp.1282-1298 (2022)

Looking at the Distant Universe with the MeerKAT Array: Discovery of a Luminous OH Megamaser at $z > 0.5$, M. Glowacki, J. Collier, A. Kazemi-Moridani, et al., ApJ, Volume 931, Issue 1, id.L7 (2022)

MeerKAT 21-cm HI imaging of Abell 2626 and beyond, J. Healy, T. Deb, M.A.W. Verheijen, S.-L. Blyth, P. Serra, M. Ramatsoku, B. Vulcani, A&A, Volume 654, id.A173 (2021)

Abell 2626 and friends: large and small scale structure, J. Healy, S.P. Willner, M.A.W. Verheijen, S.-L. Blyth, AJ, Volume 162, Issue 5, id.193 (2021)

HI content in Coma cluster substructure, J. Healy, S.-L. Blyth, M.A.W. Verheijen, K.M. Hess, P. Serra, J.M. van der Hulst, T.H. Jarrett, K. Yim, G.I.G. Jozsa, A&A, Volume 650, id.A76 (2021)

MIGHTEE: are giant radio galaxies more common than we thought?, J. Delhaize, I. Heywood, M. Prescott, M.J. Jarvis, I. Delvecchio, I.H. Whittam, S.V. White, M.J. Hardcastle, C.L. Hale, J. Alfonso, Y. Ao, M. Brienza, M. Bruggen, J.D. Collier, E. Daddi, M. Glowacki, N. Maddox, L.K. Morabito, I. Prandoni, Z. Randriamanakoto, S. Sekhar, F. An, N.J. Adams, S. Blyth, R.A.A. Bowler, L. Leeuw, L. Marchetti, S.M. Randriamampandry, K. Thorat, N. Seymour, O. Smirnov, A.R. Taylor, C. Tasse, M. Vaccari, MNRAS, Volume 501, Issue 3, p3833-3845 (2021)

MIGHTEE-HI: The H I emission project of the MeerKAT MIGHTEE survey, N. Maddox, N., B.S. Frank, A.A. Ponomareva, M.J. Jarvis, E.A.K. Adams, R. Davé, T.A. Oosterloo, M.G. Santos, S.L. Blyth, M. Glowacki, R.C. Kraan-Korteweg, W. Mulaudzi, B. Namumba, I. Prandoni, S.H.A Rajohnson, K. Spekkens, N.J. Adams, R.A.A. Bowler, J.D. Collier, I. Heywood, S. Sekhar, A.R. Taylor, A&A, Volume 646, idA35 (2021)

Systematically Asymmetric: A comparison of HI profile asymmetries in real and simulated galaxies, N. Deg, S.-L. Blyth, N. Hank, S. Kruger, C. Carignan, MNRAS, Volume 495, Issue 2, p.1984-2001 (2020)

HISS, a new tool for H I stacking: application to NIBLES spectra, J. Healy, S.-L. Blyth, E. Elson, W. van Driel, Z. Butcher, S. Schneider, M.D. Lehnert, R. Minchin, MNRAS, Volume 487, Issue 4, p.4901-4938 (2019)

On the uncertainties of results derived from HI spectral line stacking experiments, E.C. Elson, A.J. Baker, S.-L. Blyth, MNRAS, Volume 486, Issue 4, p4894-4903 (2019)

Enhanced HI profile asymmetries in close galaxy pairs, J. Bok, S.-L. Blyth, D.G. Gilbank, E.C. Elson, MNRAS, Volume 484, Issue 1, p582-594 (2019)

HST H_α grism spectroscopy of ROLES: a flatter low-mass slope for the $z\sim1$ SSFR-mass relation, Riona Ramraj, David G. Gilbank, Sarah-Louise Blyth, Rosalind E. Skelton, Karl Glazebrook, Richard G. Bower, Michael L. Balogh, MNRAS, Volume 466, Issue 3, p.3143-3160 (2017)

Synthetic data products for future HI galaxy surveys: a tool for characterising source confusion in spectral line stacking experiments, E.C. Elson, S.L. Blyth, A.J. Baker, MNRAS, Volume 460, Issue 4, p.4366-4381 (2016)

NIBLES – an HI census of stellar mass selected SDSS galaxies: I. The Nançay HI survey, W. van Driel, Z. Butcher, S. Schneider, M.D. Lehnert, R. Minchin, S-L. Blyth, L. Chemin, N. Hallet, T. Joseph, P. Kotze, R.C. Kraan-Korteweg, A.O.H. Olofsson, M. Ramatsoku, Astronomy & Astrophysics, Volume 595, id.A118, 43 (2016)

Exploring Neutral Hydrogen and Galaxy Evolution with the SKA, S.-L.Blyth, J.M. van der Hulst, M.A.W. Verheijen, HI SWG Members, B. Catinella, F. Fraternali, M.P. Haynes, K.M. Hess, B.S. Koribalski, C. Lagos, M. Meyer, D. Obreschkow, A. Popping, C. Power, L. Verdes-Montenegro, M. Zwaan (2015) PoS(AASKA14)128 (Chapter in revised SKA Science Book)

Variation of galactic cold gas reservoirs with stellar mass, N. Maddox, K.M. Hess, D. Obreschkow, M.J. Jarvis, S.-L. Blyth, MNRAS, Volume 447, Issue 2, p1610-1617 (2015)

The introductory astronomy course at the University of Cape Town: probing student perspectives, V. Rajpaul, S. Allie, S.-L. Blyth, Physical Review Special Topics - Physics Education Research (2014), Volume 10, Issue 2, id.020126

A Simple Model for Global HI Profiles of Galaxies, I.M. Stewart, S.-L. Blyth, W.J.G. de Blok, Astronomy & Astrophysics, Volume 567, A61, p27 (2014)

The Norma cluster (ACO 3627) - III. The distance and peculiar velocity via the near-infrared Ks-band Fundamental Plane, T. Mutabazi, S.-L. Blyth, P.A. Woudt, J.R. Lucey, T. H. Jarrett, M. Bilicki, A. Schroeder, S.A.W. Moore, MNRAS, Volume 439, Issue 4, p3666-3682 (2014)

Scalable desktop visualization of very large radio astronomy data cubes, S. Perkins, J. Questiaux, S. Finniss, R. Tyler, S. Blyth, M.M. Kuttel, New Astronomy, 30, 17 (2014)

Comparison of HI and optical redshifts of galaxies - the impact of redshift uncertainties on spectral line stacking, Natasha Maddox, Kelley M. Hess, S.-L. Blyth, M.J. Jarvis, MNRAS, Volume 433, Issue 3, p.2613-2625 (2013)

Quantified H I morphology - VII. Star formation and tidal influence on local dwarf H I morphology, B. W. Holwerda, N. Pirzkal, W.J.G. de Blok, S.-L. Blyth, MNRAS, Volume 435, Issue 2, pp 1020-1036 (2013)

Quantified HI Morphology – I: Multi-wavelength analysis of the THINGS galaxies, B. W. Holwerda, N. Pirzkal, W.J.G. de Blok, A. Bouchard, S.-L. Blyth, K.J. Van der Heyden, E.C. Elson, MNRAS, Volume 416, Issue 4, pp 2401-2414 (2011)

Quantified HI Morphology - II: Lopsidedness and interaction in WHISP column density maps, B. W. Holwerda, N. Pirzkal, W.J.G. de Blok, A. Bouchard, S.-L. Blyth, K.J. Van der Heyden, E.C. Elson, MNRAS, Volume 416, Issue 4, pp 2415-2425 (2011)

Quantified HI Morphology – III: Merger visibility times from HI in galaxy simulations, B. W. Holwerda, N. Pirzkal, T.J. Cox, W.J.G. de Blok, J. Weniger, A. Bouchard, S.-L. Blyth, K.J. Van der Heyden, MNRAS, Volume 416, Issue 4, pp 2426-2436 (2011)

Quantified HI Morphology – IV: The merger fraction and rate in WHISP, B. W. Holwerda, N. Pirzkal, W.J.G. de Blok, A. Bouchard, S.-L. Blyth, K.J. Van der Heyden, MNRAS, Volume 416, Issue 4, pp 2437-2446 (2011)

Luminous Red Galaxies in Simulations: Cosmic Chronometers?, S. Crawford, A. Ratsimbazafy, C. Cress, E. Olivier, S.-L. Blyth, K.J. van der Heyden, MNRAS, Volume 406, Issue 4, pp.2569-2577 (2010)

Physics:
STAR Collaboration papers authorship strictly alphabetical in all cases, no matter primary author. Other papers, primary author is listed first.

Partonic flow and ϕ-meson production in Au+Au Collisions at $\sqrt{s_{NN}}$ = 200 GeV, B.I. Abelev et al., Physical Review Letters 99, 112301, (2007)
(This is my thesis paper for which I was primary author, but listed strictly alphabetically.)

A Cone Jet-Finding Algorithm for Heavy-Ion Collisions at LHC Energies, S-L Blyth. M.J. Horner, T. Awes, T. Cormier, J.L. Klay, S.R. Klein, M. van Leeuwen, A. Morsch, G. Odyniec, A. Pavlinov, Journal of Physics G: Nucl. Part. Phys. 34 (2007)

Longitudinal Double-Spin Asymmetry for Inclusive Jet Production in p+p Collisions at s=200GeV, B.I. Abelev et al., Physical Review Letters, vol. 100, Issue 23, id. 232003 (2008)

Enhanced strange baryon production in Au+Au collisions compared to p+p at $\sqrt{s_{NN}}$=200 GeV, B.I. Abelev et al., Physical Review C, vol. 77, Issue 4, id. 044908 (2008)

ρ_0 photoproduction in ultraperipheral relativistic heavy ion collisions at $\sqrt{s_{NN}}$=200 GeV, B.I. Abelev et al., Physical Review C, vol. 77, Issue 3, id. 034910 (2008)

Forward Neutral-Pion Transverse Single-Spin Asymmetries in p+p Collisions at s=200 GeV, STAR, B.I. Abelev et al., Physical Review Letters, vol. 101, Issue 22, id. 222001 (2008)

Forward Lambda production and nuclear stopping power in d + Au collisions at $\sqrt{s_{NN}}$ = 200 GeV (STAR Collaboration) B.I. Abelev et al., Physical Review C 76 (2007) 064904

Energy dependence of pi+-, p and anti-p transverse momentum spectra for Au+Au collisions at $\sqrt{s_{NN}}$ = 62.4 and 200-GeV (STAR Collaboration) B.I. Abelev et al., Physics Letters B 655 (2007) 104

Mass, quark-number, and $\sqrt{s_{NN}}$ dependence of the second and fourth flow harmonics in ultra-relativistic nucleus-nucleus collisions (STAR Collaboration), B.I. Abelev et al., Physical Review C 75 (2007) 054906

Rapidity and species dependence of particle production at large transverse momentum for d+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV (STAR Collaboration), B.I. Abelev et al., Physical Review C 76 (2007) 054903

Strange particle production in p+p collisions at $\sqrt{s_{NN}}$ = 200 GeV (STAR Collaboration), B.I. Abelev et al., Physical Review C 75 (2007) 064901

Transverse momentum and centrality dependence of high-p(T) non-photonic electron suppression in Au+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV. (STAR Collaboration), B.I. Abelev et al., Physical Review Letters 98 (2007) 192301

Delta phi Delta eta Correlations in Central Au+Au Collisions at $\sqrt{s_{NN}}$ = 200 GeV (STAR Collaboration) J. Adams et al., Physical Review C 75 (2007) 034901

Scaling Properties of Hyperon Production in Au+Au Collisions at $\sqrt{s_{NN}}$ = 200 GeV., (STAR Collaboration), J. Adams et al., Physical Review Letters 98 (2007) 062301

Longitudinal Double-Spin Asymmetry and Cross Section for Inclusive Jet Production in Polarized Proton Collisions at $\sqrt{s_{NN}}$ = 200 GeV, B.I. Abelev et al., Physical Review Letters 97 (2006) 252001

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Identified hadron spectra at large transverse momentum in p+p and d+Au collisions at $\sqrt{s_{NN}}$ = 200 GeV, (STAR Collaboration), J. Adams et al, Physics Letters B 637 (2006) 161

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Conference Proceedings

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Looking at the distant universe with MeerKAT and SALT", S. Blyth, Proceedings of Science, "Science with SALT Workshop, 1-5 June 2015, Stellenbosch, South Africa (2015)

Acceleration of Automated HI Source Extraction, S.J. Badenhorst, S. Blyth, M.M. Kuttel, Astronomical Data Analysis Software and Systems XXII. Proceedings of a Conference held at University of Illinois, Champaign, Illinois, USA 4-8 November 2012. San Francisco: Astronomical Society of the Pacific, p.45 (2013)

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Centrality dependence of the N(Omega)/N(phi) ratios and phi v2 - a test of thermalization in Au+Au collisions at RHIC, Sarah-Louise Blyth for the STAR collaboration, J. Phys. G. 34 (2007) S933-S936 (Proceedings of Quark Matter 2006 Conference, 13-20 November 2006, Shanghai.)

ϕ-meson Production in Heavy-Ion Collisions at RHIC, Sarah-Louise Blyth for the STAR Collaboration, J. Phys. G: Nucl. Part. Phys. 32 (2006) S461-S464. (Proceedings of International Conference on Strangeness in Quark Matter (SQM2006), Los Angeles, California, 26-31 Mar 2006.)

Jet study in ultra-relativistic heavy-ion collisions with the ALICE detector at the LHC, Sarah-Louise Blyth for the ALICE-USA Collaboration, Journal of Physics G: Nucl. Part. Phys. 30 (2004) S1155

Curriculum Vitae
Rosalind E. Skelton

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South Africa

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Web: skelton.saao.ac.za

Nationality: South African
Languages: English (mother tongue), Afrikaans and German (conversant)

Education

2019 — **Strategic Management Development Course for the National Research Foundation**
Stellenbosch University Business School Executive Development, South Africa

February 2010 — **PhD, Astronomy**
University of Heidelberg, Max Planck Institute for Astronomy, Heidelberg, Germany
Thesis — The effect of mergers on galaxy formation and evolution
Supervisor — Prof. Eric Bell

2007 — **MSc, Astronomy (Awarded with Distinction)**
University of Cape Town, South Africa
Thesis — The near infrared luminosity function of the Norma cluster
Supervisors — Prof. Renée Kraan-Korteweg, Associate Prof. Patrick Woudt

2004 — **BSc Honours, Theoretical Physics (First Class)**
University of Cape Town, South Africa
Jan–April 2004 — **Semester abroad study exchange programme**
University of British Columbia, Vancouver, Canada

2001 – 2003 — **BSc, Physics & Applied Mathematics (Awarded with Distinction)**
University of Cape Town, South Africa

Employment

2025 - present — Managing Director, South African Astronomical Observatory (SAAO),
2016 - 2024 — Southern African Large Telescope (SALT) Astronomer, SAAO
2013 - 2016 — Professional Development Programme Postdoctoral Fellow, SAAO
2010 - 2013 — Postdoctoral Associate, Department of Astronomy, Yale University, New Haven, USA

Achievements, Management & Leadership Positions

March - December 2024	Acting Managing Director of SAAO
July 2024 - present	Honorary Research Associate, University of Cape Town
2023 - 2024	Head of Research at SAAO
2021 - 2024	Chair of the National Astrophysics and Space Science Programme (NASSP) Partnership
2018 - 2024	Line manager of the SALT telescope operator team
2006 - 2010	International Max Planck Research School (IMPRS) student representative
2007 - 2008	Max Planck Institute for Astronomy student representative
2005 – 2006	UCT Entrance Merit Scholarship
2004	UCT Council Honours Scholarship, Joseph Stone Scholarship, Walter H Gage & Elsie M Harvey Education Abroad Scholarship
2003	Students' Health and Welfare Centres Organisation (SHAWCO) Students' Education Projects (STEP) project leader, Khayelitsha, South Africa
2001 – 2003	Dean's Merit List, UCT Entrance Merit Scholarship
2001	Class Medal, Introduction to Astronomy (AST100S)

Professional Service & Membership

2022 - present	Member of Science Policy Board of 4MOST, Science Policy lead for the 4MOST Hemisphere Survey (4HS)
2021 - present	Subject specialist for Astronomy on the National Research Foundation Physics rating panel
2021 - present	Member of the South African National Committee for Astronomy of the International Astronomical Union
2015 - present	Member of the International Astronomical Union
2014 - present	Member of South African Women in Science and Engineering
2014 - present	Reviewer for Monthly Notices of the Royal Astronomical Society, Astrophysical Journal and South African Institute of Physics
2018 - 2020	Member of the South African SALT Time Allocation Committee (SASTAC), Chair from 2019
2013 - 2016	Co-organiser of Colloquium series, SAAO
2012	Co-organiser of Fall 2012 Colloquium series, Yale Astronomy
2011-2012	Queue schedule manager for CHIRON on the 1.5-m SMARTS telescope (CTIO, Chile)

Research Interests

I use multiwavelength data, particularly optical, near-infrared and HI 21cm radio emission, to study galaxy formation and evolution, galaxy merger histories, the stellar mass build-up of early-type galaxies, the processes that quench star formation and the environmental dependence of galaxy properties. I have co-authored 67 refereed papers in top tier Astronomical journals, with over 10000 citations and a Google Scholar $h-$index of 44 (January 2025).

Teaching and Supervision Experience

2025 - present	Co-supervisor of Damien Matthew, MSc ((UCT/SAAO)
2024 - present	Supervisor of Lara Featherstone, MSc (UCT/SAAO/SARAO)
2022 - 2024	Supervisor of Tilman Oelgeschlaeger, MSc, awarded with Distinction (NASSP, UCT)
2021 - present	Supervisor of Munira Hoosain, PhD (UCT/SAAO/SARAO), winner of DSI-Ndoni Mcunu Doctoral Award 2023
2020 - present	Supervisor of Nazir Makda, PhD (UCT/SAAO)
2018 - 2024	Lecturer for NASSP Honours Spectroscopy course
2022	Supervisor of Ndivhuwo Netshiavha, Honours (NASSP, UCT)
2021	Supervisor of Busisiwe Mbewe, Honours (NASSP, UCT)
2019 - 2020	Supervisor of Munira Hoosain, MSc (NASSP, UCT/SAAO)
2019	Supervisor of Noko Monyebodi, Honours (NASSP, UCT)
2018	Supervisor of Shilpa Ranchod, Honours (NASSP, UCT)
2017 - 2021	Supervisor of Jamie Bok, PhD (UCT/SAAO)
2017 - 2019	Supervisor of Nazir Makda, MSc (NASSP, UCT/SAAO)
2017	Supervisor of Munira Hoosain, Honours (NASSP, UCT)
2016	Supervisor of Tumelo Mangena, Honours (NASSP, UCT)
2015, 2017	Lecturer for UCT AST3003S Extragalactic Astronomy 3^{rd} year course
2013 - 2016	Co-advisor of Daniél Groenewald, PhD (North West University/SAAO)
2015	Supervisor of Boitumelo Matlapeng, Honours (NASSP, UCT)
2014	Supervisor of Jamie Bok, Honours (NASSP, UCT)
2013 - 2014	Co-supervisor of Riona Ramraj, MSc (NASSP, UCT/SAAO)
2008	Teacher of CCD laboratory course, University of Heidelberg
2006	Teaching assistant, MSc course on Extragalactic Astronomy, UCT Organiser and Lecturer for the NASSP Summer school, Cape Town
2005	Teaching assistant, 2nd year Astrophysics course, UCT
2002 - 2004	Mathematics and English tutor for the STEP project

Observing Experience & Technical Skills

- Regular service mode observing on SALT from 2016-2024. I was the project scientist for the Robert Stobie Spectrograph (RSS) detector upgrade and responsible for the Multi-object Spectroscopic mode of RSS on SALT from 2016 - 2024.
- Observing experience in classical visitor mode: DEIMOS on the Keck II telescope (10m) and LDSS3 on Clay (6.5m) Magellan Telescope.
- Principal investigator on a mulit-object spectroscopy programme with DEIMOS at Keck Observatory and multiple SALT spectroscopic programmes. Co-investigator on the BEAMS and PanAfroAGN Large Science Programmes on SALT.
- Programming languages & Analysis tools: Python, IDL, Matlab, LaTex, html, Pyraf, IRAF, SM, Gnuplot, SExtractor and MOPHONGO photometry software

Talks & Conference Presentations (selected recent)

August 2024	Contributed talk at the IAU General Assembly Focus Meeting "Harnessing ground-based optical telescopes: an opportunity for emerging astronomy in Africa", Cape Town
April 2024	Contributed Talk at the African Astronomical Society conference, Marocco (virtual)
March 2024	University of Stellenbosch Physics Colloquium
January 2024	Invited Talk at the NASSP@20 symposium, Cape Town
June 2023	Contributed Talk at the SALT Science Conference, Poland
June 2023, 2024	NASSP Winter School lectures
January 2025	SAAO Open night public talk (approx. annual since 2022)
April 2022	UCT NASSP Colloquium
Aug 2021, Dec 2024	Invited talks at the Astronomical Society of Southern Africa (ASSA) Cape centre
January 2021	Invited talk at the Astronomical Society of Southern Africa (ASSA) Hermanus centre
October 2020	Invited talk at the SAAO 200 Symposium
June 2020	Contributed Talk at the European Astronomical Society meeting
November 2019	Talk at the SALT Science meeting, IUCAA, India
July 2019	Contributed Talk at the Modelling Meerkats Centre for Extragalactic Theory Workshop, Kruger Park, South Africa
August 2018	Contributed Talk at the IAU XXX GA "Build-Up of Galaxy Clusters" Symposium
November 2015	Invited talk at Census, Evolution, Physics Conference, Yale University, USA
May 2015	Contributed talk at SALT Science Conference, Stellenbosch, South Africa

References

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Publications

Since 2009 I have co-authored 67 papers in refereed journals with over 10 000 citations. I have a Google scholar h-index of 44 (January 2025).

Refereed & Submitted Papers

67. Hatamkhani, N., Kraan-Korteweg, R. C., Blyth, S. L., **Skelton, R. E.**, 2024, ApJ, 972, 57 *"The K_s-band Luminosity Function of the Rich Cluster VC04 in the Vela Supercluster"*

66. Nedkova, K. V., Häußler, Marchesini, D. et al. (including **Skelton, R. E.**), 2024, MNRAS, 532, 3747, *"Bulge+disc decomposition of HFF and CANDELS galaxies: UVJ diagrams and stellar mass-size relations of galaxy components at $0.2 \leq z \leq 1.5$"*

65. Hoosain, M., Blyth, S.-L., **Skelton, R. E.**, et al., 2024, MNRAS, 528, 4139 *"The effect of cosmic web filaments on galaxy properties in the RESOLVE and ECO surveys"*

64. Simons, R. C., Papovich, C., Momcheva, I. G., et al. (including **Skelton, R. E.**) 2023, ApJS 266, 13, *"CLEAR: Survey Overview, Data Analysis, and Products"*

63. Mowla, L. A., Cutler, S. E., Brammer, G. B., et al. (including **Skelton, R. E.**) 2022, ApJ, 933, 129, *"3D-DASH: The Widest Near-infrared Hubble Space Telescope Survey"*

62. Bok, J., Cluver, M. E., Jarrett, T. H., **Skelton, R. E.**, Jones, M. G., Verdes-Montenegro, L., 2022, MNRAS 513, 2581, *"Decoding the star forming properties of gas-rich galaxy pairs"*

61. Glowacki, M., Collier, J. D., Kazemi-Moridani, A., et al. (including **Skelton, R. E.**) 2022, ApJL, 931, L7, *"Looking at the Distant Universe with the MeerKAT Array: Discovery of a Luminous OH Megamaser at $z > 0.5$"*

60. Nelson, E. J., Tacchella, S., Diemer, B. et al. (including **Skelton, R. E.**) 2021, MNRAS, 508, 219, *"Spatially resolved star formation and inside-out quenching in the TNG50 simulation and 3D-HST observations"*

59. Nedkova, K. V., Häußler, Marchesini, D. et al. (including **Skelton, R. E.**), 2021, MNRAS, 506, 928, *"Extending the evolution of the stellar mass-size relation at $z \leq 2$ to low stellar mass galaxies from HFF and CANDELS"*

58. Silva, A., Marchesini, D., Silverman, J. D., et al. (including **Skelton, R. E.**), 2021, ApJ, 909, 124, *"Galaxy Mergers up to $z < 2.5$. II. AGN Incidence in Merging Galaxies at Separations of 3-15 kpc"*

57. Bok, J., **Skelton, R. E.**), Cluver, M. E., Jarrett, T. H., Jones, M. G., Verdes-Montenegro, L., 2020, MNRAS, 499, 3193, *"H I study of isolated and paired galaxies: the MIR SFR-M* sequence"*

56. Leja, J. Johnson, B. D., Conroy, C. et al. (including **Skelton, R. E.**), 2019, ApJ, 877, 140L, *"An Older, More Quiescent Universe from Panchromatic SED Fitting of the 3D-HST Survey"*

55. Hill, A. R., van der Wel, A., Franx, M. et al. (including **Skelton, R. E.**), 2019, ApJ, 871, 76, *"High-redshift Massive Quiescent Galaxies Are as Flat as Star-forming Galaxies: The Flattening of Galaxies and the Correlation with Structural Properties in CANDELS/3D-HST"*

54. Estrada-Carpenter, V., Papovich, C., Momcheva, I., et al. (including **Skelton, R. E.**), 2019, ApJ, 870, 133, *"CLEAR. I. Ages and Metallicities of Quiescent Galaxies at* $1.0 < z < 1.8$ *Derived from Deep Hubble Space Telescope Grism Data"*

53. Silva, A., Marchesini, D., Silverman, J. D., et al. (including **Skelton, R. E.**), 2018, ApJ, 868, 46, *"Galaxy Mergers up to* $z < 2.5$*. I. The Star Formation Properties of Merging Galaxies at Separations of 3-15 kpc"*

52. Shipley, H., Lange-Vagle, D., Marchesini, D., et al. (including **Skelton, R. E.**), 2018, ApJS, 235, 14, *"HFF-DeepSpace Photometric Catalogs of the 12 Hubble Frontier Fields, Clusters, and Parallels: Photometry, Photometric Redshifts, and Stellar Masses"*

51. Maseda, M., van der Wel, A., Rix, H.W., et al. (including **Skelton, R. E.**), 2018, ApJ, 854, 29, *"The Number Density Evolution of Extreme Emission Line Galaxies in 3D-HST: Results from a Novel Automated Line Search Technique for Slitless Spectroscopy"*

50. Groenewald, D., **Skelton, R. E.**, Gilbank, D., Loubser, S. I., 2017, MNRAS, 467, 4101, *"The close pair fraction of BCGs since* $z = 0.5$*: major mergers dominate recent BCG stellar mass growth"*

49. Ramraj, R., Gilbank, D., Blyth, S.-L., **Skelton, R. E.**, Glazebrook, K., Bower, R. G., Balogh, M. L, MNRAS, 466, 3143, *"HST H*α *grism spectroscopy of ROLES: a flatter low-mass slope for the* $z \sim 1$ *SSFR-mass relation"*

48. Whitaker, K. E., Bezanson, R., van Dokkum, P. G., et al. (including **Skelton, R. E.**), 2017, ApJ, 838, 19, *"Predicting Quiescence: The Dependence of Specific Star Formation Rate on Galaxy Size and Central Density at* $0.5 < z < 2.5$*"*

47. Hill, A. R., Muzzin, A., Franx, M., et al. (including **Skelton, R. E.**), 2017, ApJ, 837, 147, *"The Mass, Color, and Structural Evolution of Today's Massive Galaxies Since* $z \sim 5$*"*

46. Fossati, M., Wilman, D. J., Mendel, J. T., et al. (including **Skelton, R. E.**), 2017, ApJ, 835, 153, *"Galaxy Environment in the 3D-HST Fields: Witnessing the Onset of Satellite Quenching at* $z \sim 1 - 2$*"*

45. Dickey, C. M., van Dokkum, P. G., Oesch, P. A., et al. (including **Skelton, R. E.**), 2016, ApJ, 828, 11, *"The Relation between [O III]/H*β *and Specific Star Formation Rate in Galaxies at* $z \sim 2$*"*

44. Nelson, E. J, van Dokkum, P. G., Förster Schreiber, N. M., et al. (including **Skelton, R. E.**) 2016, ApJ, 828, 11, *"Where stars form: inside-out growth and coherent star formation from HST H*α *maps of 2676 galaxies across the main sequence at* $z \sim 1$

43. Momcheva, I. G., Brammer, G. B., van Dokkum, P. G., **Skelton, R. E.**, Whitaker, K. E., Nelson, E. J., Fumagalli, M., Maseda, M. V., et al. 2016, ApJS, 225, 27 *"The*

3D-HST Survey: Hubble Space Telescope WFC3/G141 grism spectra, redshifts, and emission line measurements for $\sim 100,000$ *galaxies"*

42. Martis, N. S., Marchesini, D., Brammer, G. B., et al. (including **Skelton, R. E.**) 2016, ApJ, 827, 25, *"The Evolution of the Fractions of Quiescent and Star-forming Galaxies as a Function of Stellar Mass Since* $z = 3$*: Increasing Importance of Massive, Dusty Star-forming Galaxies in the Early Universe"*

41. Bezanson, R., Wake, D. A., Brammer, G. B., et al. (including **Skelton, R. E.**) 2016, ApJ, 822, 30, *"Leveraging 3D-HST Grism Redshifts to Quantify Photometric Redshift Performance"*

40. Fumagalli, M., Franx, M., van Dokkum, P. G. et al. (including **Skelton, R. E.**) 2016, ApJ 822, 1, *"Ages of massive galaxies at* $0.5 < z < 2.0$ *from 3D-HST rest-frame optical spectroscopy"*

39. Oesch, P. A., Brammer, G. B., van Dokkum, P. G., et al. (including **Skelton, R. E.**) 2016, ApJ, 819, 129. *"A remarkably luminous galaxy at* $z = 11.1$ *measured with Hubble Space Telescope grism spectroscopy"*

38. Nelson, E. J., van Dokkum, P. G., Momcheva, I. G., et al. (including **Skelton, R. E.**) 2016, ApJ 817, L9, *"Spatially Resolved Dust Maps from Balmer Decrements in Galaxies at* $z \sim 1.4$*"*

37. van Dokkum, P. G., Nelson, E. J., Franx, M. et al. (including **Skelton, R. E.**) 2015, ApJ 813, 23 *"Forming Compact Massive Galaxies"*

36. Whitaker, K. E., Franx, M., Bezanson, R. et al. (including **Skelton, R. E.**), 2015, ApJ 811, L12 *"Galaxy Structure as a Driver of the Star Formation Sequence Slope and Scatter"*

35. Kriek, M., Shapley, A. E., Reddy, N. A., et al. (including **Skelton, R. E.**) 2015, ApJS 218, 15 *"The MOSFIRE Deep Evolution Field (MOSDEF) Survey: Rest-Frame Optical Spectroscopy for ∼1500 H-Selected Galaxies at* $1.37 < z < 3.8$*"*

34. Pacifici, C., da Cunha, E., Charlot, S., et al. (including **Skelton, R. E.**) 2015, Monthly Notices of the Royal Astronomical Society, 447, 786 *"On the importance of using appropriate spectral models to derive physical properties of galaxies at* $0.7 < z < 2.8$*"*

33. Fumagalli, M., Labbé, I., Patel, S. G. et al. (including **Skelton, R. E.**) 2014, ApJ 796, 35, *"How Dead are Dead Galaxies? Mid-Infrared Fluxes of Quiescent Galaxies at Redshift* $0.3 < z < 2.5$*: Implications for Star Formation Rates and Dust Heating"*

32. Whitaker, K. E., Franx, M., Leja, J., van Dokkum, P. G., Henry, A., **Skelton, R. E.**, Fumagalli, M., Momcheva, I. G., et al. 2014, ApJ 795, 104, *"Constraining the Low-Mass Slope of the Star Formation Sequence at* $0.5 < z < 2.5$*"*

31. **Skelton, R. E.**, Whitaker, K. E., Momcheva, I. G. et al. 2014, ApJ 214, 24, *"3D-HST WFC3-selected Photometric Catalogs in the Five CANDELS/3D-HST Fields: Photometry, Photometric Redshifts and Stellar Masses"*

30. Nelson, E. J, van Dokkum, P.G., Franx, M. et al. (including **Skelton, R. E.**) 2014, Nature, 513, 7518, pp. 394-397 *"A massive galaxy in its core formation phase three billion years after the Big Bang"*

29. van der Wel, A., Chang, Yu-Yen, Bell, E. F., Holden, B. P., Ferguson, H. C., Giavalisco, M., Rix, H.-W., **Skelton, R. E.**, et al. 2014, ApJ 792, L6 *"Geometry of Star-forming Galaxies from SDSS, 3D-HST, and CANDELS"*

28. van Dokkum, P. G., Bezanson, R., van der Wel, A., Nelson, E. J., Momcheva, I., **Skelton, R. E.**, Whitaker, K. E., Brammer, G. B., et al. 2014, ApJ, 791, 1, 45 *"Dense Cores in Galaxies Out to z = 2.5 in SDSS, UltraVISTA, and the Five 3D-HST/CANDELS Fields"*

27. Maseda, M. V., van der Wel, A., Rix, H-W. et al. (including **Skelton, R. E.**) 2014, ApJ, 791, 17 *"The Nature of Extreme Emission Line Galaxies at z = 1-2: Kinematics and Metallicities from Near-infrared Spectroscopy"*

26. Tal, T., Dekel, A., Oesch, P. et al. (including **Skelton, R. E.**) 2014, ApJ, 789, *"Observations of Environmental Quenching in Groups in the 11 GYR since z = 2.5: Different Quenching for Central and Satellite Galaxies"*

25. Price, S. H., Kriek, M., Brammer, G. B. et al. (including **Skelton, R. E.**) 2014, ApJ, 788, 13 *"Direct Measurements of Dust Attenuation in* $z \sim 1.5$ *Star-forming Galaxies from 3D-HST: Implications for Dust Geometry and Star Formation Rates"*

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