DR. KHALED SAID

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Summary

I am an astrophysicist with a PhD from the University of Cape Town, specialising in HI-line spectra and peculiar flow fields in the Zone of Avoidance. During my doctoral studies, I published a catalogue of 21 cm HI-line spectra of southern ZOA galaxies, establishing expertise in spectral-line radio. I have been awarded 132 nights as Chief Investigator on major radio telescopes (Parkes and Nancay) and developed an HI processing pipeline that served as the main source for calculating line widths in some of the WALLABY pre-pilot and pilot survey publications. Following my doctoral studies, I have held postdoctoral and research fellow positions at leading institutions, including the Australian National University and the University of Queensland, where I am now employed as a Research Fellow. Currently, I serve as the co-chair of WALLABY SWG4 (Cosmology & Statistical Studies). I am also an active member of major international collaborations, including the DESI and 4MOST surveys. I have 43 publications in total with over 3000 citations, resulting in an h-index of 20 according to ADS and 21 according to Google Scholar. My research interests encompass HI surveys, large-scale structure and galaxy flows, galaxy formation and evolution, and photometric and spectroscopic surveys.

Professional Appointments

Research Fellow May 2023 – March 2027

The University of Queensland, St Lucia, Brisbane, QLD, Australia

Postdoctoral Research Fellow May 2020 – May 2023

The University of Queensland, St Lucia, Brisbane, QLD, Australia

Postdoctoral Research Fellow

July 2017 – May 2020

The Australian National University, Canberra ACT, Australia

Education University of Cape Town, South Africa

PhD in Astrophysics July 2017

Thesis: "Peculiar Flow Fields in the Zone of Avoidance"

Adviser: Prof. Renée C. Kraan-Korteweg

M.Sc. in Astrophysics and Space Science

December 2013

Thesis: "The Tully-Fisher relation and its cosmological applications"

Adviser: Prof. Renée C. Kraan-Korteweg

B.Sc. (Honours) in Astrophysics and Space Science December 2011

Thesis: "Bulge and Disk Profiles of THINGS Galaxies"

Adviser: Prof. Erwin de Blok

Grants and Awards

- OzGrav sponsorship of the Cosmic Flows Conference, August 2024 (2000 AUD)
- SMP Accelerator Grants Scheme, March 2024 (6000 AUD)
- 2017 winner of the Gruber Foundation and IAU Fellowship (50 000 USD)
- 1100 kSU on the Swinburne OzSTAR for Q1/Q2, 2024
- 400 hours over 39 nights as a CI on **Parkes Radio Telescope** (Australia)
- 931 hours over 93 nights as a CI on **Nancay Radio Telescope** (France)
- 37 Full nights as a CI on the Japanese Near-Infrared Telescope (South Africa)
- Science Faculty PhD Fellowship at UCT, 2014 2016 (320 000 ZAR)
- NRF Fellowship for M.Sc. at UCT, Jan 2012 Dec 2013 (190 000 ZAR)
- NRF Fellowship for Honours at UCT, Jan 2011 Dec 2011 (95 000 ZAR)

Postgraduate Supervision

- Rianna Bell: Probing Cosmology using Peculiar Velocities, University of Queensland (PhD, Ongoing)
- **Presley Nolan-Petilla**: Impact of Zero-Point Calibration on Peculiar Velocity Measurements, University of Queensland (Honours, **Ongoing**)
- Paula Boubel: Testing gravity with the peculiar velocities of galaxies, Australian National University (PhD, Submitted, currently scientific data analyst with NASA Exoplanet Archive)
- Rafif Rabbani: Peculiar velocities from 6dFGS, SDSS, and LAMOST, Institut Teknologi Bandung (MSc, Graduated, currently a PhD student at the Australian National University)
- Rianna Bell: Calibration of WISE W1 and W2 Tully-Fisher relation, University of Queensland (Honours, Graduated, currently a PhD student at the University of Queensland)
- **Swarnim Shirke**: Cosmological parameters from the 6dF galaxy survey, Australian National University (Future Research Talent at ANU, currently PhD student at the Research Institute in Pune, India)

Publications

Summary: I have authored a book chapter, 38 peer-reviewed journal publications, and four conference proceedings, collectively amassing over 3000 citations with an h-index of 20, as documented by the Astrophysics Data System (ADS). A selected list of publications relevant to the position is included below. A complete list of all publications can be found at the end of this CV.

Book Chapter

• Tully-Fisher relation

Khaled Said (2023), Invited chapter for the edited book Hubble Constant Tension (Eds. E. Di Valentino and D. Brout, Springer Singapore)

Selected Journal Articles

- DESI peculiar velocity survey Fundamental Plane Said, Khaled and Howlett, Cullan and Davis, Tamara +58 co-authors (2025), MNRAS, 539, 3627
- Data Release 1 of the Dark Energy Spectroscopic Instrument DESI Collaboration including Said, K. (2025), arXiv:2503.14745
- The Hubble Tension in Our Own Backyard: DESI and the Nearness of the Coma Cluster Scolnic, Daniel and Riess, Adam G. +8 co-authors including Said, Khaled (2025), *ApJL*, *979*, *L9*
- Large-scale motions and growth rate from forward-modelling Tully-Fisher peculiar velocities Boubel, Paula and Colless, Matthew and Said, Khaled and Staveley-Smith, Lister (2024), MNRAS, 531, 84
- WALLABY pre-pilot and pilot survey: Tully Fisher relation in Eridanus, Hydra, Norma, and NGC4636 fields Courtois, Hélène M. and Said, Khaled and Mould, Jeremy +25 co-authors (2023), MNRAS, 519, 4589
- The 4MOST Hemisphere Survey of the Nearby Universe (4HS)
 Taylor, E. N. and Cluver, M. and Bell, E. +31 co-authors including Said, K. (2023), *The Messenger, 190, 46*
- Cosmicflows-4
 - Tully, R. Brent and Kourkchi, Ehsan +14 co-authors including Said, Khaled (2023), ApJ, 944, 94
- Calibration of the Tully-Fisher relation in the WISE W1 and W2 bands
 Bell, Rianna and Said, Khaled and Davis, Tamara and Jarrett, T. H. (2023), MNRAS, 519, 102
- WALLABY pilot survey: Public release of H I data for almost 600 galaxies from phase 1 of ASKAP pilot observations
 - Westmeier, T. and Deg, N. and Spekkens, K. +40 co-authors including Said, K. (2022), PASA, 39, e058
- Joint analysis of 6dFGS and SDSS PV for the growth rate of cosmic structure and tests of gravity Khaled Said, Matthew Colless, Christina Magoulas, John Lucey, and Michael Hudson (2020), MNRAS, 497, 1275
- The H I mass function in the Parkes H I Zone of Avoidance survey Khaled Said, Renée C. Kraan-Korteweg, and Lister Staveley-Smith (2019), MNRAS, 486, 1796
- NIR Tully-Fisher in the Zone of Avoidance. II. 21 cm H I-line spectra of southern ZOA galaxies Khaled Said, Renée C. Kraan-Korteweg, Lister Staveley-Smith +3 co-authors (2016), MNRAS, 457, 2366
- On how to extend the NIR Tully Fisher relation to be truly all-sky Said, K. and Kraan-Korteweg, R. C. and Jarrett, T. H. (2015), MNRAS, 447, 1618

Professional Society Membership

- Junior Member of the International Astronomical Union
- OzGrav Associate Investigator
- Member of the WALLABY survey
- Member of the DESI survey
- Member of the 4MOST Hemisphere Survey

Committees, Administrative tasks

- Chair of the SOC of the Cosmic Flows 2025, Brisbane, Australia
- Member of the SOC of the ASA Annual Science Meeting 2021
- Regular refereeing for the MNRAS
- Regular refereeing (expert/non-expert) for students' theses at UQ

Observing Proposals as PI

I have been awarded more than \$500,000 in observing time, including 39 nights as Chief Investigator on the Parkes radio telescope (Australia), 93 nights on the Nançay radio telescope (France), and 37 nights on the Japanese Near-Infrared Telescope at the South African Astronomical Observatory. In December 2021, I was part of the successful international team that secured entry to the 4MOST Survey Consortium through an open and competitive process, serving as one of the leads of its three key science themes (€11.9 M).

Selected Invited Talks

- DESI Peculiar Velocity Survey, Cosmic Flows 2025, Brisbane, Australia, 2–8 Feb 2025
- Peculiar Velocities and their applications for Cosmology, **SKA Cosmo HI Surveys** WG Meeting, 1 December 2023.
- Cosmology with Peculiar Velocity Surveys, cosmology seminar at the Institute of Theoretical Astrophysics, University of Oslo, **Oslo**, **Norway**, 28 November 2023.
- Cosmology with Current and Future Peculiar Velocity Surveys, **Cosmology from Home** Conference, Online, 6 July 2023.
- The DESI Peculiar Velocity Survey, ICRAR/UWA Seminar, The University of Western Australia, **Perth, Australia**, 14 April 2022.
- The DESI Peculiar Velocity Survey, RSAA Seminar, The Australian National University, **Canberra, Australia**, 7 April 2022.
- A new Era of cosmology with peculiar velocity, Cosmology Seminar Cambridge, DAMTP, University of Cambridge, **Cambridge**, **UK**, 14 March 2022.
- The DESI Peculiar Velocity Survey: The Fundamental Plane Relation, Virtual Collaboration Meeting, 07 Dec 2021.
- First DESI peculiar velocity measurements with Denali data at the Summer DESI Collaboration Meeting, **Berkeley, California, USA**, 18 June 2021.
- Cosmology with Peculiar Velocities: Present and Future at the Korea Astronomy and Space Science Institute, **Daejeon, South Korea**, 15 April 2021.
- Cosmology with Peculiar Velocities: Present and Future, Centre for Astrophysics, University of Southern Queensland, **Queensland**, **Australia**, 21 April 2021.
- Constraining the cosmological parameters with peculiar velocities, the Centre of Astrophysics and Supercomputing at Swinburne University of Technology. **Melbourne**, **Australia**, 10 September 2020.
- The growth rate of cosmic structure and tests of gravity, Cosmic Flows, Large-scale Structure & Visualisation, Cape Town, South Africa, 17 21 February 2020.
- The Taipan galaxy survey, Studying the Universe with GAlaxy surveys Revealing the Unlimited in ShangHai (SUGAR-RUSH), **Shanghai**, **China**, 11 15 June 2018.
- The Taipan galaxy survey, Cosmic Visions Dark Energy Workshop, **Berkeley, California, USA**, 14 15 November 2017.

Teaching

The University of Queensland, Brisbane, Australia

2025

Lecturer: Master of Data Science program (DATA7901)

Themed project: Galaxy Classification for Next-Generation Astronomical Surveys

The University of Queensland, Brisbane, Australia

2024

Lecturer: Master of Data Science program (DATA7903)

Themed project: Predicting the outcome of space missions with data science

The University of Queensland, Brisbane, Australia

Second Semester 2020, 2021, 2022, 2023, and 2025

Lecturer: Frontiers in Astrophysics PHYS4080

Galaxy Surveys. BAO. Peculiar velocities. Correlation functions

Second Semester 2019

The Australian National University, Canberra ACT, Australia

Lecturer: Astronomy ASTR3002

Galaxies and Cosmology

University of Cape Town, Rondebosch, Cape Town, South Africa

2014-2016

Teaching Assistant

Astronomy 2002H - Introduction to Modern Astrophysics

Physics 1012F - Mechanics for Engineers

Physics 1013S - Electromagnetism for Engineers

References

Prof. Matthew Colless AO FAA FRAS

(e-mail: matthew.colless@anu.edu.au)

The Australian National University, Mt Stromlo Observatory

Cotter Rd, Weston Creek, ACT 2611, Australia

Prof. Tamara Davis AM FAA

(e-mail: tamarad@physics.uq.edu.au)

The University Of Queensland

St Lucia, Brisbane, QLD 4072, Australia

Prof. Hélène M. Courtois

(e-mail: helene.courtois@univ-lyon1.fr)

University Lyon 1

University Lyon 1, IUF, IP2I Lyon, 69622 Villeurbanne cedex, France

Prof. Lister Staveley-Smith

(e-mail: lister.staveley-smith@uwa.edu.au)

Interim Executive Director, International Centre for Radio Astronomy Research (ICRAR)

ICRAR M468, The University of Western Australia

Crawley, Western Australia, 6009, Australia

Complete Publications List

- 1. **DESI EDR: Calibrating the Tully-Fisher Relationship with the DESI Peculiar Velocity Survey** Douglass, K. and BenZvi, S. and Uberoi, N. and Howlett, C. and Saulder, C. and **Said, K.** +42 co-authors (2025), *arXiv:2507.11765*
- DESI peculiar velocity survey Fundamental Plane
 Said, Khaled and Howlett, Cullan and Davis, Tamara and Lucey, John and Saulder, Christoph +58 co-authors (2025), MNRAS, 539, 3627
- 3. The CosmoVerse White Paper: Addressing observational tensions in cosmology with systematics and fundamental physics

Di Valentino, Eleonora and Levi Said, Jackson and Riess, Adam and **Said, Khaled** +200 co-authors (2025), *arXiv:2504.01669*

- 4. Data Release 1 of the Dark Energy Spectroscopic Instrument DESI Collaboration including Said, K. (2025), arXiv:2503.14745
- 5. **Testing anisotropic Hubble expansion**Boubel, Paula and Colless, Matthew and **Said, Khaled** and Staveley-Smith, Lister (2025), *JCAP*, 2025, 066
- 6. **Improving the Determination of Supernova Cosmological Redshifts by Using Galaxy Groups**Peterson, Erik R. and Carreres, Bastien and Carr, Anthony and Scolnic, Daniel and Bailey, Ava and Davis,
 Tamara M. and Brout, Dillon and Howlett, Cullan and Jones, David O. and Riess, Adam G. and **Said, Khaled**and Taylor, Georgie (2025), *ApJ*, *980*, *21*
- 7. The Hubble Tension in Our Own Backyard: DESI and the Nearness of the Coma Cluster Scolnic, Daniel and Riess, Adam G. and Murakami, Yukei S. and Peterson, Erik R. and Brout, Dillon and Acevedo, Maria and Carreres, Bastien and Jones, David O. and Said, Khaled and Howlett, Cullan and Anand, Gagandeep S. (2025), *ApJL*, *979*, *L9*
- 8. An improved Tully-Fisher estimate of H_0 Boubel, Paula and Colless, Matthew and Said, Khaled and Staveley-Smith, Lister (2024), MNRAS, 533, 1550
- 9. The Early Data Release of the Dark Energy Spectroscopic Instrument DESI Collaboration including Said, K. (2024), *AJ*, *168*, *58*
- 10. **Galaxy and Mass Assembly (GAMA): Stellar-to-dynamical Mass Relation. II. Peculiar Velocities**Dogruel, M. Burak and Taylor, Edward N. and Cluver, Michelle and Colless, Matthew and de Graaff, Anna and Sonnenfeld, Alessandro and Lucey, John R. and D'Eugenio, Francesco and Howlett, Cullan and **Said**, **Khaled** (2024), *ApJ*, *970*, *149*
- 11. The hyperplane of early-type galaxies: using stellar population properties to increase the precision and accuracy of the fundamental plane as a distance indicator
 D'Eugenio, Francesco and Colless, Matthew and van der Wel, Arjen and Vaughan, Sam P. and Said, Khaled
 +9 co-authors (2024), MNRAS, 532, 1775
- 12. Large-scale motions and growth rate from forward-modelling Tully-Fisher peculiar velocities
 Boubel, Paula and Colless, Matthew and Said, Khaled and Staveley-Smith, Lister (2024), MNRAS, 531, 84
- 13. Validation of the Scientific Program for the Dark Energy Spectroscopic Instrument DESI Collaboration including Said, K. (2024), *AJ*, 167, 62
- 14. **DESI EDR: Calibration of the Tully-Fisher Relationship with the DESI Peculiar Velocity Survey** Douglass, Kelly and BenZvi, Segev and Nofi, Hayley and Uberoi, Navya and Saulder, Christoph and Howlett, Cullan and **Said, Khaled** (2024), *AAS Meeting Abstracts*, *243*, *407.09*
- 15. An effective description of Laniakea: impact on cosmology and the local determination of the Hubble constant

Giani, Leonardo and Howlett, Cullan and Said, Khaled and Davis, Tamara and Vagnozzi, Sunny (2024), *JCAP*, 2024, 071

- 16. Tully-Fisher relation
 - **Said, Khaled** (2023), Invited book chapter for Hubble Constant Tension (Eds. E. Di Valentino and D. Brout, Springer Singapore), *arXiv:2310.16053*
- 17. **Target selection for the DESI Peculiar Velocity Survey**Saulder, Christoph and Howlett, Cullan and Douglass, Kelly A. and **Said, Khaled** and BenZvi, Segev +28 co-authors (2023), *MNRAS*, *525*, *1106*

- 18. Galaxy clusters in the Vela Supercluster I. Deep NIR catalogues
 - Hatamkhani, N. and Kraan-Korteweg, R. C. and Blyth, S. L. and Said, K. and Elagali, A. (2023), MNRAS, 522, 2223
- 19. Cross-correlating radial peculiar velocities and CMB lensing convergence
 - Giani, Leonardo and Howlett, Cullan and Ruggeri, Rossana and Bianchini, Federico and **Said, Khaled** and Davis, Tamara M. (2023), *JCAP*, 2023, 002
- 20. WALLABY pre-pilot and pilot survey: The Tully Fisher relation in Eridanus, Hydra, Norma, and NGC4636 fields
 - Courtois, Hélène M. and **Said, Khaled** and Mould, Jeremy and Jarrett, T. H. and Pomarède, Daniel +23 co-authors (2023), *MNRAS*, 519, 4589
- 21. The 4MOST Hemisphere Survey of the Nearby Universe (4HS)
 - Taylor, E. N. and Cluver, M. and Bell, E. and Said, K. +30 co-authors (2023), The Messenger, 190, 46
- 22. Cosmicflows-4
 - Tully, R. Brent and Kourkchi, Ehsan and Courtois, Hélène M. and Anand, Gagandeep S. and Blakeslee, John P. and Brout, Dillon and Jaeger, Thomas de and Dupuy, Alexandra and Guinet, Daniel and Howlett, Cullan and Jensen, Joseph B. and Pomarède, Daniel and Rizzi, Luca and Rubin, David and **Said, Khaled** and Scolnic, Daniel and Stahl, Benjamin E. (2023), *ApJ*, *944*, *94*
- 23. Calibration of the Tully-Fisher relation in the WISE W1 and W2 bands
 Bell, Rianna and Said, Khaled and Davis, Tamara and Jarrett, T. H. (2023), MNRAS, 519, 102
- 24. The DESI Survey Validation: Results from Visual Inspection of Bright Galaxies, Luminous Red Galaxies, and Emission-line Galaxies
 - Lan, Ting-Wen and Tojeiro, R. and Armengaud, E. and Said, K. +50 co-authors (2023), ApJ, 943, 68
- 25. The Pantheon+ Analysis: Evaluating Peculiar Velocity Corrections in Cosmological Analyses with Nearby Type Ia Supernovae
 - Peterson, Erik and Kenworthy, William and Scolnic, Daniel and Riess, Adam and Brout, Dillon and Carr, Anthony and Courtois, Helene and Davis, Tamara and Dwomoh, Arianna and Jones, David and Popovic, Brodie and Rose, Benjamin and **Said, Khaled** (2023), *AAS Meeting Abstracts, 241, 424.08*
- 26. **Improving the Redshifts and Peculiar Velocities of the Pantheon+ Supernovae**Carr, Anthony and Davis, Tamara and Scolnic, Daniel and **Said, Khaled** and Brout, Dillon and Peterson, Erik
 - Carr, Anthony and Davis, Tamara and Scolnic, Daniel and Said, Khaled and Brout, Dillon and Peterson, Erik and Kessler, Richard (2023), AAS Meeting Abstracts, 241, 424.07
- 27. WALLABY pilot survey: Public release of H I data for almost 600 galaxies from phase 1 of ASKAP pilot observations
 - Westmeier, T. and Deg, N. and Spekkens, K. and Said, K. +40 co-authors (2022), PASA, 39, e058
- 28. Overview of the Instrumentation for the Dark Energy Spectroscopic Instrument DESI Collaboration including Said, K. (2022), *AJ*, 164, 207
- 29. The Pantheon+ analysis: Improving the redshifts and peculiar velocities of Type Ia supernovae used in cosmological analyses
 - Carr, Anthony and Davis, Tamara M. and Scolnic, Dan and **Said, Khaled** and Brout, Dillon and Peterson, Erik R. and Kessler, Richard (2022), *PASA*, *39*, *e046*
- 30. The Pantheon+ Analysis: Cosmological Constraints
 - Brout, Dillon and Scolnic, Dan and Popovic, Brodie and Riess, Adam G. and Carr, Anthony and Zuntz, Joe and Kessler, Rick and Davis, Tamara M. and Hinton, Samuel and Jones, David and Kenworthy, W. D'Arcy and Peterson, Erik R. and **Said, Khaled** +26 co-authors (2022), *ApJ*, *938*, *110*
- 31. The Pantheon+ Analysis: Evaluating Peculiar Velocity Corrections in Cosmological Analyses with Nearby Type Ia Supernovae
 - Peterson, Erik R. and Kenworthy, W. D'Arcy and Scolnic, Daniel and Riess, Adam G. and Brout, Dillon and Carr, Anthony and Courtois, Hélène and Davis, Tamara and Dwomoh, Arianna and Jones, David O. and Popovic, Brodie and Rose, Benjamin M. and **Said, Khaled** (2022), *ApJ*, *938*, *112*
- - Howlett, Cullan and Said, Khaled and Lucey, John R. and Colless, Matthew and Qin, Fei and Lai, Yan and Tully, R. Brent and Davis, Tamara M. (2022), MNRAS, 515, 953

- 33. Galaxy And Mass Assembly (GAMA): Data Release 4 and the z < 0.1 total and z < 0.08 morphological galaxy stellar mass functions
 - Driver, Simon P. and Bellstedt, Sabine and Robotham, Aaron S. G. and **Said, Khaled** +65 co-authors (2022), *MNRAS*, *513*, *439*
- 34. Cosmic Flow Measurement and Mock Sampling Algorithm of Cosmicflows-4 Tully-Fisher Catalog Qin, Fei and Parkinson, David and Howlett, Cullan and Said, Khaled (2021), *ApJ*, 922, 59
- 35. **A near-infrared study of the obscured 3C129 galaxy cluster**Ramatsoku, M. and Verheijen, M. A. W. and Kraan-Korteweg, R. C. and Jarrett, T. H. and **Said, K.** and Schröder, A. C. (2020), *A&A*, *644*, *A107*
- 36. Joint analysis of 6dFGS and SDSS peculiar velocities for the growth rate of cosmic structure and tests of gravity
 Said, Khaled and Colless, Matthew and Magoulas, Christina and Lucey, John R. and Hudson, Michael J. (2020), MNRAS, 497, 1275
- 37. WiFeS follow-up observations of the naked-eye nova associated to MGAB-V207 Carr, A. and Said, K. and Davis, T. M. and Lidman, C. and Tucker, B. E. (2020), *The Astronomer's Telegram*, 13874, 1
- 38. A Search for Extragalactic Diffuse Interstellar Bands: SAMI Data
 Puspitarini, L. and Premadi, P. W. and Colless, M. and Oh, S. and Hidayat, T. and Putra, M. and Barone, T. M. and Said, K. and Barat, D. (2019), *Journal of Physics Conference Series, 1245, 012013*
- 39. The H I mass function in the Parkes H I Zone of Avoidance survey Said, Khaled and Kraan-Korteweg, Renée C. and Staveley-Smith, Lister (2019), MNRAS, 486, 1796
- 40. NIR Tully-Fisher in the Zone of Avoidance III. Deep NIR catalogue of the HIZOA galaxies Said, Khaled and Kraan-Korteweg, Renée C. and Jarrett, T. H. and Staveley-Smith, Lister and Williams, Wendy L. (2016), MNRAS, 462, 3386
- 41. NIR Tully-Fisher in the Zone of Avoidance II. 21 cm H I-line spectra of southern ZOA galaxies Said, Khaled and Kraan-Korteweg, Renée C. and Staveley-Smith, Lister and Williams, Wendy L. and Jarrett, T. H. and Springob, Christopher M. (2016), MNRAS, 457, 2366
- 42. On how to extend the NIR Tully Fisher relation to be truly all-sky Said, K. and Kraan-Korteweg, R. C. and Jarrett, T. H. (2015), MNRAS, 447, 1618
- 43. **Galaxy peculiar velocities in the Zone of Avoidance Said, K.** and Kraan-Korteweg, R. C. and Jarrett, T. H. (2014), *arXiv:1410.2992*