Sam P. Vaughan

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Employment

2019 – Present ◇ **Astro^{3D} Postdoctoral Research Associate, University of Sydney**
Supervisor: Prof. Scott Croom
I study the stellar populations of nearby galaxies using the SAMI galaxy survey and am working on preparations for the upcoming Hector galaxy survey.

Education

2015 – 2019 ◇ **DPhil in Astrophysics, University of Oxford**
Supervisor: Prof. Roger Davies
A study of stellar populations in the last 5 billion years using Integral Field Spectroscopy

2011 – 2015 ◇ **MPhys in Physics, New College, University of Oxford.**
First Class Honours.
2012: College Exhibition awarded for exam performance (£300)
2013-2015: College Scholarship awarded for exam performance (£300 p.a.)

2014 – 2015 ◇ **Masters Thesis, University of Oxford**
Supervisor: Prof. Chris Lintott
The star formation histories of SDSS galaxies with Galaxy Zoo

Supervision

PhD Students
◇ **2020 – Present: Yifan Mai**
Galaxy Evolution in the past 5 Gyrs
Co-supervised with Prof. Scott Croom

Honours Students
◇ **2022 – Present** Desheng Wang
Galaxy Kinematics as a function of environment
Co-supervised with Prof. Scott Croom

Undergraduate Students
◇ **2021** Joel Shortland & Oliver Oayda
The Morphology-Density relation in the MAGPI survey
Co-supervised with Dr. Carline Foster

◇ **2019 – 2020** Yifan Mai
The relationship between galaxy spin and the motion of its neighbours
Co-supervised with Prof. Scott Croom

◇ **2019** Samuel Eames
Milky Way analogues in the SAMI Survey
Co-supervised with Dr. Nic Scott

◇ **2018** Chloe James-Turner
Galaxy Kinematics in the densest environments
Co-supervised with Roger Davies

Teaching

2020 – Present
- **University of Sydney**
  Course Coordinator: Online module "*OLE 1640: From the Big Bang to Darkness*". 150+ students enrolled each semester.

2016-2018
- **St Catherine's College, University of Oxford**
  Tutor for second year Mathematical Methods for Physicists

2017-2018
- **Undergraduate Lab Demonstrator**
  Astrophysics computing lab
- **UK Astronomy Olympiad Lecturer**
  Galaxies course

Skills

Computing
- Python, Bash scripting, Linux/UNIX operating systems, LaTeX, R
- High performance computing on parallelised hardware using MPI
- Version control and collaborative software development using Git and Github
- Python data analysis pipelines (numpy, scipy, matplotlib, probablistic programming tools) and basic machine learning workflow (Tensorflow, scikit-learn, Keras)

Observing
- 31 nights observing experience, split between the VLT, Chile (3 nights with KMOS), the AAT, Australia (5 nights with the KOALA IFU, 19 with Hector) and Palomar observatory, USA (4 nights with the SWIFT IFU)

Service

2021 – Present
- Sydney Institute for Astronomy Seminar Organiser

June 2021
- One of eight postdocs selected to represent Astro^{3D} during the Australian Research Council's mid-term review of the centre.

2020 – Present
- Member of the Astro^{3D} junior early career researcher committee.

2017 – Present
- Invited referee for The Astrophysical Journal and the Monthly Notices of the Royal Astronomical Society

Research Publications

I have a total of 267 citations with an h-index of 8.

Peer Reviewed Journal Articles

1. **Vaughan**, S. P., Barone, T. M., Croom, S. M., & ... (2021). The SAMI galaxy survey: implications for quenching timescales from the relationship between stellar metallicity, mass and size. *submitted*.

2. **Vaughan**, S. P., Tiley, A. L., Davies, R. L., Prichard, L. J., Croom, S. M., Bureau, M., … Jarvis, M. J. (2020). K-CLASH: Strangulation and ram pressure stripping in galaxy cluster members at $0.3 < z < 0.6$. *Monthly Notices of the Royal Astronomical Society*. doi:10.1093/mnras/staa1837

3. **Vaughan**, S. P., Davies, R. L., Zieleniewski, S., & Houghton, R. C. W. (2018a). The stellar population and initial mass function of NGC 1399 with MUSE. *Monthly Notices of the Royal Astronomical Society*. doi:10.1093/mnras/sty1434

4 **Vaughan**, S. P., Davies, R. L., Zieleniewski, S., & Houghton, R. C. W. (2018b). Radial measurements of IMF-sensitive absorption features in two massive ETGs. *Monthly Notices of the Royal Astronomical Society*. doi:10.1093/mnras/stx3199

5 van de Sande, J., **Vaughan**, S. P., Cortese, L., & ... (2021, August). The SAMI Galaxy Survey: a statistical approach to an optimal classification of stellar kinematics in galaxy surveys. *505*(2), 3078–3106. doi:10.1093/mnras/stab1490. arXiv: 2011.08199 [astro-ph.GA]

6 Prichard, L. J., **Vaughan**, S. P., & Davies, R. L. (2019). Unravelling the origin of the counter-rotating core in IC 1459 with KMOS and MUSE. *Monthly Notices of the Royal Astronomical Society*. doi:10.1093/mnras/stz1191

7 Tiley, A. L., **Vaughan**, S. P., Stott, J. P., Davies, R. L., Prichard, L. J., Bunker, A., … Ansarinejad, B. (2020). K-CLASH: spatially resolving star-forming galaxies in field and cluster environments at z = 0.2-0.6. *Monthly Notices of the Royal Astronomical Society*. doi:10.1093/mnras/staa1418

8 Foster, C., Mendel, J. T., Lagos, C. D. P., Wisnioski, E., ..., **Vaughan**, S. P., & .... (2020). The MAGPI Survey – science goals, design, observing strategy, early results and theoretical framework. *arXiv e-prints*. arXiv: 2011.13567

9 Poetrodjojo, H., Groves, B., Kewley, L. J., Sweet, S. M., ..., **Vaughan**, S., & ... (2021). The SAMI Galaxy Survey: reconciling strong emission line metallicity diagnostics using metallicity gradients. *Monthly Notices of the Royal Astronomical Society*. doi:10.1093/mnras/stab205

10 Croom, S. M., Taranu, D. S., van de Sande, J., Lagos, C. D. P., ..., & **Vaughan**, S. P. (2021, August). The SAMI Galaxy Survey: the role of disc fading and progenitor bias in kinematic transitions. *505*(2), 2247–2266. doi:10.1093/mnras/stab1494. arXiv: 2105.10179 [astro-ph.GA]

11 Watson, P. J., Davies, R. L., ..., **Vaughan**, S. P., & ... (2022, February). The SAMI Galaxy Survey: trends in [α/Fe] as a function of morphology and environment. *510*(1), 1541–1556. doi:10.1093/mnras/stab3477. arXiv: 2106.01928 [astro-ph.GA]

12 Croom, S. M., Owers, M. S., Scott, N., Poetrodjojo, H., Groves, B., ..., & **Vaughan**, S. P. (2021). The SAMI Galaxy Survey: the third and final data release. *Monthly Notices of the Royal Astronomical Society*. doi:10.1093/mnras/stab229

13 van de Sande, J., Croom, S. M., Bland-Hawthorn, J., ..., & **Vaughan**, S. P. (2021, December). The SAMI galaxy survey: Mass and environment as independent drivers of galaxy dynamics. *508*(2), 2307–2328. doi:10.1093/mnras/stab2647. arXiv: 2109.06189 [astro-ph.GA]

14 Fraser-McKelvie, A., Cortese, L., Groves, B., ..., **Vaughan**, S., & ... (2022, February). The SAMI Galaxy Survey: the drivers of gas and stellar metallicity differences in galaxies. *510*(1), 320–333. doi:10.1093/mnras/stab3430. arXiv: 2111.11627 [astro-ph.GA]

15 Parikh, T., Thomas, D., Maraston, C., Westfall, K. B., ..., **Vaughan**, S., & ... (2018). SDSS-IV MaNGA: The Spatially Resolved Stellar Initial Mass Function in 400 Early-Type Galaxies. *Monthly Notices of the Royal Astronomical Society*. doi:10.1093/mnras/sty785. eprint: 1803.08515

16 Zieleniewski, S., Houghton, R. C. W., Thatte, N., Davies, R. L., & **Vaughan**, S. P. (2017). Radial gradients in initial mass function sensitive absorption features in the Coma brightest cluster galaxies. *Monthly Notices of the Royal Astronomical Society*. doi:10.1093/mnras/stw2712

17 Banfield, J. K., Andernach, H., Kapińska, A. D., ..., **Vaughan**, S., & ... (2016). Radio Galaxy Zoo: discovery of a poor cluster through a giant wide-angle tail radio galaxy. *Monthly Notices of the Royal Astronomical Society*. doi:10.1093/mnras/stw1067

Presented Talks

2021
- **Scanning galactic barcodes: The stellar populations of nearby galaxies from spatially resolved spectroscopy**, Monash University invited colloquium, Australia
- **Stellar Metallicities and Galaxy Quenching in the SAMI Survey**, University of Melbourne invited colloquium, Australia

2020
- **Stellar Populations in the SAMI galaxy survey**, Astro^{3D} Science meeting, Australia
- **Stellar Populations in the SAMI galaxy survey**, Astro^{3D} Science meeting, Australia
- **KCLASH- the field and cluster environments at z∼0.5**, 236th American Astronomical Society meeting (online)

2018
- **KCLASH- the field and cluster environments at z∼0.5**, "KMOS@5" workshop, ESO headquarters, Garching
- **KCLASH- the field and cluster environments at z∼0.5**, International Astronomical Union general assembly, Vienna
- **The Initial Mass Function in Early Type Galaxies**, Oxford Galaxy Evolution Seminar (1hr)

2017
- **Radial IMF meausurements in NGC 1399**, Royal Astronomical Society specialist discussion meeting
- **The IMF and stellar populations of early-type galaxies**, "Thirty Minute Talk" series at ESO Vitacura, Santiago
- **MUSEings on the IMF in NGC 1399**, National Astronomy Meeting, Hull

2016
- **The Iron Hydride Molecule in Early Type Galaxies**, The Universal Problem of the Non-Universal IMF: Lorentz Centre, Leiden
- **The IMF in two nearby Massive Galaxies** National Astronomy Meeting, Nottingham

References

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Professor Roger Davies
University of Oxford,
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Dr. John Stott
University of Lancaster
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