

# Amelia Fraser-McKelvie

*Extragalactic Astronomer*

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## Work Experience

2017– Present **Postdoctoral Research Associate**, *University of Nottingham, Nottingham, U.K.*, Working within the MaNGA group. Research interests include galaxy evolution and quenching, spatially-resolved components within galaxies and their stellar populations and gas properties..

Supervisors: Prof Mike Merrifield, Prof Alfonso Aragón-Salamanca.

2013–2017 **PhD in Observational Astronomy**, *Monash University, Melbourne, Australia*.

Thesis title: Photometric and Spectroscopic Observations of Star Formation in Nearby Galaxies.

Supervisors: A/Prof Michael J. I. Brown, Dr Kevin Pimbblet

## Publications

I have seven first-author publications, and eleven co-authorships. I have published in both the Monthly Notices of the Royal Astronomical Society (MNRAS; impact factor of 5.107), and the MNRAS Letters (impact factor 5.521). I have also refereed manuscripts for the Astrophysical Journal.

19. **Fraser-McKelvie, A.**, Merrifield, M., Aragón-Salamanca, A., (submitted) "From the Outside Looking in: What can Milky Way Analogues Tell us About the Star Formation Rate of Our Own Galaxy?", *MNRAS*, *submitted*.
18. **Fraser-McKelvie, A.**, Merrifield, M., Aragón-Salamanca, A., Peterken, T., Masters, K., Krawczyk, C., Andrews, B., Knapen, J., Kruk, S., Schaefer, A., Smethurst, R., Riffel, R., Brownstein, J., Drory, N., (2019) "SDSS-IV MaNGA: Stellar Population Gradients Within Barred Galaxies", *MNRAS*, 488, L6.
17. **Fraser-McKelvie, A.**, Aragón-Salamanca, A., Merrifield, M., Tabor, M., Bernardi, M., Drory, N., Parikh, T., Argudo-Fernández, M. (2018) "SDSS-IV MaNGA: The Formation Sequence of S0 Galaxies", *MNRAS*, 481, 5580.
16. **Fraser-McKelvie, A.**, Brown, M. J. I., Pimbblet, K. A., Dolley, T., Bonne, N., (2018) "Multiple Mechanisms Quench Passive Spiral Galaxies", *MNRAS*, 474, 1909.
15. **Fraser-McKelvie, A.**, Brown, M. J. I., Pimbblet, K. A., Dolley, T., Crossett, J. P., Bonne, N., (2016) "A Photometrically and Spectroscopically Confirmed Population of Passive Spiral Galaxies", *MNRAS*, 462, 11.
14. **Fraser-McKelvie, A.**, Pimbblet, K. A., Penny, S. J., Brown, M. J. I., (2016) "The Many Assembly Histories of Massive Void Galaxies as Revealed by Integral Field Spectroscopy", *MNRAS*, 459, 754.
13. **Fraser-McKelvie, A.**, Brown, M. J. I., Pimbblet, K. A., (2014) "The Rarity of Star Formation in Brightest Cluster Galaxies as Measured by WISE", *MNRAS*, 444, L63.

12. **Fraser-McKelvie, A.**, Pimblet, K. A., Lazendic-Galloway, J., (2011) "An Estimate of the Electron Density of Filaments of Galaxies at  $z \sim 0.1$ ", *MNRAS*, 415, 1961.
11. Peterken, T., **Fraser-McKelvie, A.**, Aragón-Salamanca, A., Merrifield, M., Kraljic, K., Knapen, J., Riffel, R., Brownstein, J., Drory, N. "Time-slicing spiral galaxies with SDSS-IV MaNGA", *MNRAS*, *accepted*.
10. Parkash, V., Brown, M. J. I., Jarrett, T. H., **Fraser-McKelvie, A.**, Cluver, M. E., (2019) "HI Galaxies with Little Star Formation: an Abundance of LIERs", *MNRAS*, 485, 3169.
9. Parikh, T., Thomas, D., Maraston, C., Westfall, K. B., Lian, J., **Fraser-McKelvie, A.**, Andrews, B. H., Drory, N., Meneses-Goytia, S., (2019) "SDSS-IV MaNGA: local and global chemical abundance patterns in early-type galaxies", *MNRAS*, 483, 3420.
8. Tabor, M., Merrifield, M., Aragón-Salamanca, A., **Fraser-McKelvie, A.**, Peterken T., Smethurst, R., Drory N., Lane R. R., (2019) "SDSS-IV MaNGA: Full Spectroscopic Bulge-Disc Decomposition of MaNGA Early-Type Galaxies", *MNRAS*, 485, 1546.
7. Smethurst, R., Merrifield, M., Lintott, C., Masters, K., **Fraser-McKelvie, A.**, Peterken, T., Boquien, M., Riffel, R., Drory, N., (2019) "SNITCH: Seeking a Simple, Informative Star Formation History Inference Tool", *MNRAS*, 484, 3590.
6. Gordon, Y. A., Pimblet, K. A., Owers, M., Kaviraj, S., O'Dea, C., Walmsley, M., Baum, S., Crossett, J., **Fraser-McKelvie, A.**, Lintott, C., Pierce, J., (2019) "Major-Mergers Trigger Inefficient Black Hole Accretion in Low-Mass Radio Galaxies", *ApJ*, 878, 88.
5. Aguado, D. S., ... **Fraser-McKelvie, A.**, ... et al., (2019), "The Fifteenth Data Release of the Sloan Digital Sky Surveys: First Release of MaNGA Derived Quantities, Data Visualisation Tools and Stellar Library", *ApJS*, 240, 23.
4. Usher, C., Beckwith, T., Bellstedt, S., Alabi, A., Chevalier, L., Pastorello, N., Cerulo, P., Dalgleish, H., **Fraser-McKelvie, A.**, Kamann, S., Penny, S., Foster, C., McDermid, R., Schiavon, R., Villaume, A., (2019) "The WAGGS project - II. The reliability of the calcium triplet as a metallicity indicator in integrated stellar light", *MNRAS* 482, 1275.
3. Usher, C., Pastorello, N., Bellstedt, S., Alabi, A., Cerulo, P., Chevalier, L., **Fraser-McKelvie, A.**, Penny, S., Foster, C., McDermid, R., Schiavon, R., Villaume, A (2017) "The WAGGS project - I. The WiFeS Atlas of Galactic Globular cluster Spectra", *MNRAS*, 468, 3828.
2. Childress, M. J., Tucker, B. E., Yuan, F., Scalzo, R., Ruiter, A., Seitzzahl, I., Zhang, B., Schmidt, B., Anguiano, B., Aniyani, S., Bayliss, D. D. R., Bento, J., Bessell, M., Bian, F., Davies, R., Dopita, M., Fogarty, L., **Fraser-McKelvie, A.**, Freeman, K., Kuruwita, R., Medling, A. M., Murphy, S. J., Murphy, S. J., Owers, M., Panther, F., Sweet, S. M., Thomas, A. D., Zhou, G., (2016) "The ANU WiFeS SuperNovA Program (AWSNAP)", *PASA*, 33, 55.
1. Pimblet, K. A., Shabala, S. S., Haines, C. P., **Fraser-McKelvie, A.**, Floyd, D. J. E., (2013) "The Drivers of AGN Activity in Galaxy Clusters: AGN Fraction as a Function of Mass and Environment" *MNRAS*, 429, 1827.

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## Awards, Scholarships, and Grants

- 2018 **RAS Ongoing Grants Scheme**, *Royal Astronomical Society*, (£760).  
Funding to establish the Trailblazing Women in Astronomy Lecture Series, a series of lectures delivered by prominent female astronomers with the aim of inspiring and engaging junior female and minority astronomers.
- 2016 **Postgraduate Publication Award**, *Monash University*, (\$6600).  
Funding to publish work submitted as part of my thesis.
- 2013-2016 **Australian Postgraduate Award (APA)**, (\$25000 per annum).
- 2013-2015 **J. L. William Fellowship**, *Monash University School of Physics*, (\$5000 per annum).  
APA topup awarded to the top PhD student commencing in physics each year.
- 2012 **Summer Vacation Scholarship**, *Monash University School of Physics*, (\$2700).  
A paper was written and published from this work.
- 2011 **Summer Vacation Scholarship**, *Monash University School of Mathematical Sciences*, (\$2700).  
Skills in computer coding and presentation developed.
- 2007 **Women in Engineering Bursary**, *Monash University Department of Mechanical and Aerospace Engineering*, (\$2000).  
Awarded to the top 10 female students commencing engineering studies each year.

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## Conference Presentations

### Talks

- July 2019 **IAU Symposium 353: Galactic Dynamics in the Era of Large Surveys**, *Shanghai, China*, **Oral presentation**.  
"Temporal Insights into the Secular Evolution of Bars from the MaNGA Galaxy Survey."
- June 2019 **SDSS Collaboration Meeting**, *Ensenada, Mexico*, **Oral Presentation**.  
"Age-Dating Stellar Population Trends in Milky Way Analogues."
- March 2019 **The Life and Death of Starforming Galaxies**, *Perth, Australia*, **Oral presentation**.  
"The Formation Sequence of S0 Galaxies."
- June 2018 **SDSS Collaboration Meeting**, *Seoul, South Korea*, **Oral presentation**.  
"The Formation Sequence of S0 Galaxies."
- May 2018 **Galactic Rings: Signposts of Secular Evolution in Disk Galaxies**, *Tuscaloosa, Alabama*, **Oral presentation**.  
"The stellar populations of bars in MaNGA galaxies."
- December 2017 **MaNGA Collaboration Meeting**, *Campeche, Mexico*, **Oral presentation**.  
"The Bulges and Disks of S0 Galaxies."
- July 2017 **RAS National Astronomy Meeting**, *Hull, U.K.*, **Oral presentation**.  
"Multiple Mechanisms Quench Passive Spiral Galaxies."
- July 2015 **The Many Pathways to Galaxy Growth**, *Prato, Italy*, **Oral presentation**.  
"Star Formation in Local Universe Brightest Cluster Galaxies."
- September 2014 **Evolving Galaxies in Evolving Environments**, *Bologna, Italy*, **Oral Presentation**.  
"The Rarity of Star Formation in Local Universe BCGs".

### Posters

- September 2016 **The Changing Face of Galaxies**, *Hobart, Australia*, **Poster Presentation**.
- July 2015 **Royal Astronomical Society National Astronomy Meeting**, *Llandudno, Wales*, **Poster Presentation**.
- July 2014 **Astronomical Society of Australia Annual Scientific Meeting**, *Macquarie University, Australia*, **Poster Presentation**.

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## Invited Seminars

- June 2019 **The Open University, U.K.**, Departmental seminar.  
April 2019 **University of Sydney, Aus**, Departmental seminar.  
April 2019 **Australian National University, Aus**, Departmental seminar.  
March 2019 **Swinburne University, Aus**, Departmental colloquium.  
March 2019 **University of Melbourne, Aus**, Departmental seminar.  
Jan 2019 **University of Oxford, U.K.**, Galaxy evolution seminar.  
Nov 2018 **University of Leeds, U.K.**, Departmental seminar.  
June 2018 **University of Hertfordshire, U.K.**, Departmental seminar.  
April 2018 **University of Bristol, U.K.**, Departmental seminar.

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## Collaboration Memberships

- 2017-  
Present **Sloan Digital Sky Survey - IV**, *Mapping Nearby Galaxies at APO (MaNGA) Galaxy Survey*.

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## Leadership

- 2019-  
Present **MaNGA Science Committee Member**, *Responsible for providing guidance on survey data products and software needs and usage, collaborating on "big-idea" topics that require multi-pronged efforts, coordinating work on similar topics and resolving potential conflicts, triggering projects to exploit science opportunities or address widespread needs, and followup observations, internal meetings, and international conferences..*

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## Professional Memberships

- 2017-  
Present **Royal Astronomical Society**, *Fellow*.  
2013-  
Present **Astronomical Society of Australia**, *International Member*.

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## Software Skills

### Programming Languages

- Proficiency with Python (including Astropy, Numpy, Scipy, Matplotlib), MATLAB and command line languages such as Awk. Experience with IDL, R and SQL.

### Other Software

- Proficiency with astronomical software packages such as IRAF/pyRAF, ds9, GAIA, Topcat,  $\text{\LaTeX}$ , pPXF, GANDALF, Starlight, along with Mac OSX, Linux and Windows platforms and common software such as Microsoft Office.

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## Student Supervision & Teaching Experience

- 2018-2019 **Two fourth year undergraduate masters students, supervised directly**, *University of Nottingham*, Project title: 'Estimating the rate of star formation in spiral galaxies'.  
2017-2018 **Two fourth year undergraduate masters students, supervised directly**, *University of Nottingham*, Project title: 'Are low mass passive spiral galaxies an environmental phenomenon?'.  
2011-2017 **Teaching associate**, *Monash University*, Teaching 2nd and 3rd year undergraduate labs and tutorials.

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## Selected Outreach & Mentoring

- 2019 **Pint of Science, U. K.**, *Talk: 'The Science of Space Flight'*, Science talks in pubs across the UK aimed at interested members of the public.
- 2019 **Frontiers in Physics Panel Member**, *University of Nottingham*, Participant in a panel on careers in physics aimed at undergraduate physicists.
- 2018 **Blog post for Galaxy Zoo**, *Online at <https://blog.galaxyzoo.org/2018/07/17/finding-bars-in-galaxy-zoo-3d/>*, A blog post aimed at informing and engaging the public.
- 2018 **Talk: How to Write a Paper**, *University of Nottingham PhD student journal club*, A presentation on tips and tricks for writing and submitting journal articles.

## Selected Organisational Experience

- Organiser of Nottingham Astronomy Group's weekly seminar series 2018-Present.
- Founder and organiser of the Royal Astronomical Society-funded Trailblazing Women in Astronomy Lecture series, a series of seminars given by prominent women in astronomy to staff and students of universities all over England. The aim is to inspire and engage female PhD students and junior staff by interacting with a highly accomplished astronomer in their field, encouraging them to continue their studies or career in astronomy.
- I organised the Monash Centre for Astrophysics contribution to the Astrolight 2016 festival at the Scienceworks museum, aimed at bringing astronomy to the public. My role involved organising people and activities, ordering merchandise, and manning our stall on the night.
- I have been on the local organising committee of both the 2013 ASA Harley Wood Winter School and the 2016 ANITA workshop and summer school. Both of these have required me to help plan each conference, organise social activities for participants, assist with enquiries and provide information to participants.
- I organised and ran Monash Centre for Astrophysics' annual PhD day in 2013, which is a day-long gathering of all of Monash's astronomy staff and students to listen to talks from its PhD students. This involved organising venues, talks and catering, chairing sessions throughout the day and making sure the event ran smoothly.

## Education

- 2012 **Honours degree of Bachelor of Science (First Class)**, *Monash University, Melbourne, Australia*, Supervisor: Dr Kevin Pimbblet.  
Thesis title: The Morphological Properties of Filaments of Galaxies.
- 2007-2011 **Bachelor of Aerospace Engineering (with Honours) and Bachelor of Science**, *A double degree, Monash University, Melbourne, Australia*.  
Science majors: Applied Mathematics, Astrophysics
- 2005-2006 **Victorian Certificate of Education**, *Warrandyte High School, Melbourne, Australia*.

## Observing Experience

- 2014-2018 **WiFeS Integral Field Spectrograph**, *ANU's 2.3m telescope, Siding Spring Observatory, NSW*.  
36 nights on this telescope, 25 of which I was PI for with a mixture on onsite and remote observing. Tasks involved target selection under changing conditions, observing, and troubleshooting both hardware and software problems.
- 2012 **GAMA observing run**, *AAT, Siding Spring Observatory, NSW*.  
6 nights, responsible for redshifting.