CURRICULUM VITAE

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RESEARCH ACHIEVEMENTS:

I have been actively researching the properties of AGNs in both the low and high redshift universe for eleven years, ten years postdoctoral. Since completion of my PhD my main research achievements have been as follows:

- Showing that the levels of far-infrared emission from AGN-hosting galaxies has decreased significantly over the last 10 billion years. Since far-infrared emission is largely produced by star-formation, this shows that early AGNs resided in galaxies that were forming stars much rapidly than today (see Mullaney et al. 2010, MNRAS, 401, 905 & Mullaney et al. 2012, MNRAS, 419, 95).
- Using Spitzer spectroscopy and IRAS photometry to empirically constrain the intrinsic mid to far-infrared spectral energy distributions (SEDs) of AGNs. Knowing the intrinsic AGN infrared SED has allowed us and other groups to precisely quantify the levels of AGN activity and star-formation taking place in galaxies across cosmic time (see Mullaney et al. 2011, MNRAS, 414, 1082).
- Exploiting the deepest data obtained by the Herschel Space Telescope to show that the mean-average star-forming properties of X-ray selected AGN are consistent with that of typical star-forming galaxies at similar redshifts. This provides strong evidence that the majority of AGNs do not reside in star-bursting galaxies and thus are unlikely to be triggered major mergers events (see Mullaney et al. 2012, MNRAS, 419, 95).
- Using stacking techniques on the deepest X-ray images yet obtained to show that, on average, black hole growth has closely tracked galaxy growth over the last 10 billion years, irrespective of galaxy mass. Since the vast majority of star-formation is not triggered by rare major mergers, we interpret our results as providing further evidence that a significant fraction of black hole growth is triggered instead by slow, secular processes such as disk instabilities (see Mullaney et al. 2012, ApJL, 753, 30).
- Analysing the spectra of ~25,000 AGN to determine the prevalence of AGN-driven outflows in the low redshift (i.e., $z<0.4$) Universe. This work demonstrated that fast (i.e., >500 km/s) outflows are present in around 10% of all AGN at these redshifts. In doing so, I also revealed a close link between outflow speed and the radio properties of the AGN, suggesting radio jets may play an important role in driving these outflows (see Mullaney et al. 2013, MNRAS, 433, 622).

EDUCATION:

- 2005 - 2008: **Postgraduate:** Durham University. Ph. D. in Astronomy. "The location and kinematics of the emission line regions in AGNs". Supervised by Prof. Martin Ward.
- 2004 - 2005: Period spent in industry.
- 2000 - 2004: **Undergraduate:** University of Nottingham. M.Sci. Physics with Astronomy. First Class Honours.

RESEARCH CAREER:

- 2016 - Present: Lecturer in Astrophysics, The University of Sheffield
- 2013 - 2016: Vice Chancellor's Fellow. The University of Sheffield.
- 2012 - 2013: Leverhulme Early Career Research Fellow. Durham University. (3 yr funded position cut at 18 months to take up Vice Chancellor's fellowship).
- 2010 - 2012: Eurotalents Research Fellow, CEA-Saclay. Jointly funded by an FP7 European research grant and the French Government.
- 2008 - 2010: Research Fellow at Durham University, funded by a Leverhulme Trust Research Prize awarded to Dr. D. M. Alexander.

PUBLICATIONS

- First author on 9 refereed journal articles (attracting >700 citations as of July 2017).
- Author on 64 refereed journal articles overall (attracting >3700 citations as of July 2017).
- H-index: 34

AWARDS, FELLOWSHIPS AND GRANTS:

- *November, 2017:* Co-I on Sheffield astronomy group's STFC consolidated grant. Final grant amount TBC, expected > £1M.
- January, 2017: Awarded £75,000 from STFC to fund project working with Thai researchers to train Thai postgraduate students on handling and analysing large datasets.
- November, 2014: Awarded £10,000 from The University of Sheffield to fund proof-of-concept research into applying astronomical image analysis techniques to biological imaging data. This grant was used, in part, to fund a summer research student throughout July and August, 2015.
- March, 2013: Awarded a Vice Chancellor's Fellowship.
- May, 2011: Awarded a Leverhulme Early Career Research Fellowship.
- December, 2009: Awarded a Eurotalents Research Fellowship, part funded by a European FP7 grant.
- March, 2002: Awarded a Universitas-21 grant to study at the University of Toronto, Canada, during my 3rd year of undergraduate studies.

INVITED CONFERENCE TALKS:

In addition to delivering talks at over twenty international conferences and seminars, I have also been invited to give talks at the following conferences:

- Chania, Crete, Invited Review Talk, Sep. 2015, *The demographics and environments of AGN*.
- Puerto Varas, Chile, Invited talk, March, 2015, *Unveiling the AGN – galaxy evolution connection.*
- Leiden, The Netherlands, Invited talk, July, 2013, *Co-evolution of BH accretion and SFR.*
- Sicily, Italy, Invited talk, June 2013, *Co-evolution of BH accretion and SFR.*
- Ringberg Castle, Germany, Invited talk, December, 2012, *Co-evolution of BH accretion and SFR.*

SELECTED POSITIONS OF RESPONSIBILITY:

- Co-organiser of the RAS Discussion Meeting: The Link Between AGN and Galaxy Formation, December, 2017.
- Postgraduate admissions tutor for the Astronomy Group, 2016 - onwards
- University of Sheffield's Liaison for the Square Kilometre Array, January 2015 - onwards
- Member of the Science Organising Committee of the Demographics and Environments of AGN international conference, Crete, 2015
- Member of the Science Organising Committee of the AGN vs. Star formation international conference, Durham, 2014
- Discussion session lead at the AGN vs. Star formation international conference, Durham, 2014
- Principal supervisor to departmentally-funded PhD student at The University of Sheffield (2013-2017)
- Principal supervisor to two 4th year undergraduate MSci students at The University of Sheffield (2013-2014)
- Organiser of the IDL and python programming postgraduate course at Durham University (2011-2012).
- Principal organiser of the 2009 Durham-Edinburgh Extragalactic meeting.
- Referee for the Monthly Notices of the Royal Astronomical Society and the Astrophysical Journal.

OUTREACH:

- Tapton School, Sheffield, April 2014 - Onwards.
  Regular participation in GCSE and A-Level Physics classes to help the children relate what they are learning to cutting edge physics and astronomy research.
- Manor College Of Technology, Hartlepool, April 2009:
  Interactive presentation to three classes of 11 and 12 years old pupils discussing the benefits and technological challenges associated with Man's recent exploration of Mars.
- Acre Rigg Primary School, Peterlee, March 2009:
  An hour long discussion with a group of 11 year old pupils concerning the current state of the art in both ground based and space based astronomical observatories.
- Beijing, China, March 2008:
  Gave a presentation on the current quest to find extraterrestrial life to a group of young students learning English as a foreign language.
- Framwellgate School, Durham, May 2006:
  Gave a presentation to a group of 14 year old pupils on the history and distance scale of the Universe.
- Sunderland Amateur Astronomy Society, November 2006:
  Presented a talk on the history of the study of Active Galactic Nuclei.

PUBLICATION LIST

Nine first author (>700 citations) papers; 64 papers in total (> 3700 citations).

First-authored papers:

1. **Mullaney, J. R.** and 35 colleagues,
   The NuSTAR Extragalactic Surveys: Initial results and catalog from the Extended Chandra Deep Field - South.
   Accepted for publication; awaiting reference code
2. **Mullaney, J. R.** and 18 colleagues,
   ALMA and Herschel reveal that AGN and main-sequence galaxies have different star formation rate distributions
   2015, arXiv, 1506.05459
3. **Mullaney, J. R.**, and 5 colleagues,
   Narrow-line region gas kinematics of 24,264 optically-selected AGN: the radio connection,
   2013, MNRAS, 433, 622
4. **Mullaney, J. R.**, and 8 colleagues,
   The Hidden "AGN Main Sequence": Evidence for a Universal Black Hole Accretion to Star Formation Rate Ratio since $z \sim 2$ Producing an M_{BH}-M_* Relation,
   2012, ApJ, 753, L30
5. **Mullaney, J. R.**, and 30 colleagues,
   GOODS-Herschel: the far-infrared view of star formation in active galactic nucleus host galaxies since $z \sim 3$,
   2012, MNRAS, 419, 95
6. **Mullaney, J. R.**, and 3 colleagues,
   Defining the intrinsic AGN infrared spectral energy distribution and measuring its contribution to the infrared output of composite galaxies,
   2011, MNRAS, 414, 1082
7. **Mullaney, J. R.**, and 4 colleagues,
   Characterising the far-infrared properties of distant X-ray detected AGNs: evidence for evolution in the infrared-X-ray luminosity ratio,
   2010, MNRAS, 401, 995
8. **Mullaney, J. R.**, and 4 colleagues,
   The location and kinematics of the coronal-line emitting regions in active galactic nuclei,
   2009, MNRAS, 394, L16
9. **Mullaney, J. R.** and Ward, M. J.,
   Optical emission-line properties of narrow-line Seyfert 1 galaxies and comparison active galactic nuclei,
   2008, MNRAS, 385, 53

Selected co-authored papers

10. Bernhard E., **Mullaney, J. R.** and 3 colleagues
    An enhanced fraction of starbursting galaxies among high Eddington ratio AGNs
    2016, MNRAS, 460, 902
11. Harrison C. M., Alexander D. M, **Mullaney J. R.** and 5 colleagues
    The KMOS AGN Survey at High redshift (KASHz): the prevalence and drivers of ionized outflows in the host galaxies of X-ray AGN
    2016, MNRAS, 456, 1195
12. Harrison C. M., Alexander D. M, **Mullaney J. R.** and Swinbank, A. M.
    Kiloparsec-scale outflows are prevalent among luminous AGN: outflows and feedback in the context of the overall AGN population
    2014, MNRAS, 441, 3306
13. Del Moro A., **Mullaney J. R.** and 26 colleagues
    NuSTAR J033202-2746.8: Direct Constraints on the Compton Reflection in a Heavily Obscured Quasar at $z \approx 2$
    2014, ApJ, 786, 16
14. Hickox, R. C., **Mullaney J. R.** and 5 colleagues
    Black Hole Variability and the Star Formation-Active Galactic Nucleus Connection: Do All Star-forming Galaxies Host an Active Galactic Nucleus?
    2014, ApJ, 782, 9

Co-authored papers

15. Riguccini, L. and 22 colleagues [0],
    The composite nature of Dust-Obscured Galaxies (DOGs) at z ˜ 2-3 in the COSMOS field - I. A far-infrared view
    2015, MNRAS, 452, 470
16. Pannella, M and 27 colleagues [16],
    GOODS-Herschel: Star Formation, Dust Attenuation, and the FIR-radio Correlation on the Main Sequence of Star-forming Galaxies up to z ≈4
    2015ApJ, 807, 141
17. Del Moro, A. and 12 colleagues [0],
    Mid-infrared luminous quasars in the GOODS-Herschel fields: a large population of heavily-obscured, Compton-thick quasars at z~2
    2015, arXiv, 1504.03329
18. Stanley, F and 7 colleagues [1],
    A remarkably flat relationship between the average star formation rate and AGN luminosity for distant X-ray AGN
    2015, arXiv, 1502.07756
19. Rodighiero, G. and 14 colleagues [6],
    Relationship between Star Formation Rate and Black Hole Accretion At Z = 2: the Different Contributions in Quiescent, Normal, and Starburst Galaxies
    2015, ApJ, 800L, 10
20. Harrison C. M. and 7 colleagues [6]
    Storm in a "Teacup": A Radio-quiet Quasar with ≈10 kpc Radio-emitting Bubbles and Extreme Gas Kinematics
    2015, ApJ, 800, 45
21. Rosario, D. and 62 colleagues [4],
    The host galaxies of X-ray selected active galactic nuclei to z = 2.5: Structure, star formation, and their relationships from CANDELS and Herschel/PACS
    A&A 573, A85
22. Bernhard, E. and 6 colleagues [4],
    Modelling the connection between ultraviolet and infrared galaxy populations across cosmic times
    2014, MNRAS, 442, 509
23. Harrison C. M. and 3 colleagues [29],
    Kiloparsec-scale outflows are prevalent among luminous AGN: outflows and feedback in the context of the overall AGN population
    2014, MNRAS, 441, 3306
24. Drouart, G. and 16 colleagues [24],
    Rapidly growing black holes and host galaxies in the distant Universe from the Herschel Radio Galaxy Evolution Project
    2014, A&A, 566A, 53
25. Del Moro A. and 27 colleagues [12],
    NuSTAR J033202-2746.8: Direct Constraints on the Compton Reflection in a Heavily Obscured Quasar at z ≈ 2
    2014, ApJ, 786, 16
26. Lansbury G. and 25 colleagues [17],
    NuSTAR Observations of Heavily Obscured Quasars at z ~ 0.5
    2014, ApJ, 785, 17
27. Rovilos E. and 10 colleagues [7],
    A wide search for obscured active galactic nuclei using XMM-Newton and WISE
    2014, MNRAS, 438, 494
28. Hickox R. C. and 6 colleagues [61],
    Black Hole Variability and the Star Formation-Active Galactic Nucleus Connection: Do All Star-forming Galaxies Host an Active Galactic Nucleus?
    2014, ApJ, 782, 9
29. Alexander, D. M. and 33 colleagues [33],
    The NuSTAR Extragalactic Survey: A First Sensitive Look at the High-energy Cosmic X-Ray Background Population
    2013, ApJ, 773, 125
30. Chen, C. J., and 16 colleagues [49],
    A Correlation between Star Formation Rate and Average Black Hole Accretion in Star-forming Galaxies
    2013, ApJ,773,3

31. Rosario, D. J., and 16 colleagues [20],
Nuclear Activity is more prevalent in Star-Forming Galaxies
2013ApJ, 771, 63
32. Georgantopoulos, I., and 17 colleagues [2],
The XMM deep survey in the CDFS IV. Candidate Compton-thick AGN
2013, arXiv, 1303.5556
33. Lehmer, B. D., and 11 colleagues [6],
Concurrent Supermassive Black Hole and Galaxy Growth: Linking Environment and Nuclear Activity in z = 2.23 Hα Emitters,
2013, ApJ, 765, 87
34. Rawlings, J. I., and 17 colleagues [5],
Polycyclic aromatic hydrocarbon emission in powerful high-redshift radio galaxies
2013, MNRAS, 429, 744
35. Juneau, S., and 26 colleagues [43],
Widespread and Hidden Active Galactic Nuclei in Star-forming Galaxies at Redshift >0.3
2013, ApJ, 764, 176
36. Basu-Zych, A. R., and 14 colleagues [29],
The X-ray Star Formation Story as Told by Lyman Break Galaxies in the 4 Ms CDF-S,
2013, ApJ, 762, 45
37. Del Moro, A., and 25 colleagues [39],
GOODS-Herschel: radio-excess signature of hidden AGN activity in distant star-forming galaxies,
2013, A&A, 549, 59
38. Harrison, C. M., and 12 colleagues [50],
Energetic galaxy-wide outflows in high-redshift ultraluminous infrared galaxies hosting AGN activity,
2012, MNRAS, 426, 1073

39. Kirkpatrick, A., and 27 colleagues [46],
GOODS-Herschel: Impact of Active Galactic Nuclei and Star Formation Activity on Infrared Spectral Energy Distributions at High Redshift,
2012, ApJ, 759, 139
40. Harrison, C. M., and 20 colleagues [52],
No clear submillimetre signature of suppressed star formation amongst X-ray luminous AGNs,
2012ApJ, 760L, 15
41. Béthermin, M., and 12 colleagues [64],
A Unified Empirical Model for Infrared Galaxy Counts Based on the Observed Physical Evolution of Distant Galaxies,
2012, ApJ, 757, L23
42. Rovilos, E., and 32 colleagues [43],
GOODS-Herschel: ultra-deep XMM-Newton observations reveal AGN/star-formation connection,
2012, A&A, 546, A58
43. Bournaud, F., and 9 colleagues [43],
An Observed Link between Active Galactic Nuclei and Violent Disk Instabilities in High-redshift Galaxies,
2012, ApJ, 757, 81
44. Kartaltepe, J. S., and 42 colleagues [89],
GOODS-Herschel and CANDELS: The Morphologies of Ultraluminous Infrared Galaxies at z ~ 2,
2012, ApJ, 757, 23
45. Goulding, A. D., and 7 colleagues [53],
Deep Silicate Absorption Features in Compton-thick Active Galactic Nuclei Predominantly Arise due to Dust in the Host Galaxy,
2012, ApJ, 755, 5
46. Magdis, G. E., and 17 colleagues [58],
GOODS-Herschel: Gas-to-dust Mass Ratios and CO-to-H_2 Conversion Factors in Normal and Starbursting Galaxies at High-z,
2011, ApJ, 740, L15
47. Magdis, G. E., and 27 colleagues [28],
GOODS-Herschel: a population of 24 um dropout sources at z < 2,
2011, A&A, 534, A15
48. Alexander, D. M., and 20 colleagues [46],
X-Ray Spectral Constraints for z ~ 2 Massive Galaxies: The Identification of Reflection-dominated Active Galactic Nuclei,
2011, ApJ, 738, 44
49. Elbaz, D., and 54 colleagues [403],
GOODS-Herschel: an infrared main sequence for star-forming galaxies,
2011, A&A, 533, A119
50. Hony, S., and 16 colleagues [7],
The Spitzer discovery of a galaxy with infrared emission solely due to AGN activity,
2011, A&A, 531, A137
51. Hickox, Ryan C., and 20 colleagues [43],
Clustering of Obscured and Unobscured Quasars in the Boötes Field: Placing Rapidly Growing Black Holes in the Cosmic Web,
2011, ApJ, 731, 117
52. Goulding, A. D., and 6 colleagues [27],
Searching for Compton-thick active galactic nuclei at z~0.1,
2011, MNRAS, 411, 1231
53. Goulding, A. D., and 3 colleagues [32],
Towards a complete census of active galactic nuclei in nearby galaxies: the incidence of growing black holes,
2010, MNRAS, 406, 597
54. Lehmer, B. D., and 9 colleagues [14],
The Chandra Deep Protocluster Survey: point-source catalogues for a 400-ks observation of the z = 3.09 protocluster in SSA22,
2009, MNRAS, 400, 299
55. Jin, C., and 4 colleagues [21],
The Seyfert AGN RX J0136.9-3510 and the spectral state of super Eddington accretion flows,
2009, MNRAS, 398, L16
56. Gelbord, J. M., and two colleagues [16],
AGN with strong forbidden high-ionization lines selected from the Sloan Digital Sky Survey,
2009, MNRAS, 397, 172

RELEVANT EXPERIENCE:

- Extensive experience analysing deep, infrared observations undertaken by both the Herschel and Spitzer Space Telescopes.
- Experience in interpreting results obtained from deep X-ray observations.
- Developing a routine to measure the relative amounts of star-formation and AGN activity taking place in a galaxy using only infrared data.
- Developing a fully automatic routine to accurately measure the profiles of emission lines in tens of thousands of spectra extracted from the Sloan Digital Sky Survey archives.
- Observing: I have performed observations with five world class ground based facilities, Gemini (Chile), Subaru, (Hawai'i), PdBI (France), WHT (La Palma, Spain) and IRTF (Hawai'i).

SELECTED SUCCESSFUL TELESCOPE PROPOSALS

- Infrared Telescope Facility (**P.I. J. Mullaney**, 3 nights, 2016**)**
- SINFONI; Very Large Telescope (**P.I. J. Mullaney**, 20 hours, 2015)
- ISIS; WHT (**P.I. J. Mullaney**, 3 nights, 2014)
- SINFONI; Very Large Telescope (**P.I. J. Mullaney**, 6.4 hours, 2014)
- Chandra XVP (P.I. G. Hasinger, 1.25 Ms, 2014)
- KMOS; Very Large Telescope (**P.I. J. Mullaney**, 2.5 hours, 2014)
- ALMA (P.I. D. Alexander; 10 hours; 2013)
- ALMA (**P.I. J. Mullaney;** 3.6 hours; 2012)
- Plateau de Bure (**P.I. J. Mullaney;** 3 tracks; 2012)
- Gemini Telescope (**P.I. J. Mullaney**; 18.0 hours; 2010)

COLLOQUIA:

- The University of Nottingham, June, 2016
- The University of Sussex, January, 2016
- ESO, Germany, April, 2015
- The University of Leeds, November, 2014
- The University of Sheffield, November, 2012
- ESO, Germany, June, 2012
- Observatoire de Paris, France, May, 2012
- Nottingham University, November, 2011
- Edinburgh University, November, 2011
- Cardiff University, November, 2011
- Mullard Space Science Laboratory, February 2010
- University of Sheffield, June 2008
- Penn State University, January 2008