AGN versus star formation: the fate of the gas in galaxies

Dartmouth-Durham Extragalactic Workshop,

Durham, England 28 July–1 August 2014

http://astro.dur.ac.uk/AGNvsSF/

How is AGN activity connected to star formation? This remains one of the key unsolved questions in astronomy and cosmology. Both processes are driven by a cold gas supply and we should therefore expect a loose connection. However, a slew of empirical and theoretical evidence suggest an unexpectedly tight symbiotic link between AGN activity and star formation, whereby the fuelling and regulation of one process is dictated by the other. The effectiveness of this fuelling and regulation and (most crucially) whether it is predominantly dictated by AGN activity or star formation is a matter of intense debate, and has important implications for the growth of galaxies and black holes over cosmic time.

The objective of this workshop is to bring together observers and theorists to discuss the connection between AGN activity and star formation on small (< 100 pc), large (≈ 0.1–10 kpc), and cosmological scales to address the following key questions:

- What evidence is there for a symbiotic connection between AGN activity and star formation?
- What physical processes drive gas into the centre/how do star formation and AGN activity compete for cold gas?
- How does star formation control AGN activity?
- What impact does AGN activity have on star formation?
- How different would the Universe look without AGNs?
- What key tests and observations do we need to make progress?

Workshop Format

The talks and posters have been organised into three main session, called “Evidence” (session A), “Feeding” (session B) and “Impact” (session C) to address the questions listed above. After the talks for each of the three main sessions there will be a 1.25 hour discussion session. Each discussion session will begin with 1 min poster talks, followed by a chaired discussion reflecting upon the talks and posters that have been presented.

Scientific Organising Committee

David Alexander ● Ryan Hickox ● Tom Theuns ● Almudena Alonso-Herrero ● Frederic Bournaud ● Ric Davies ● Raffaella Morganti ● James Mullaney ● Rachel Somerville

Local Organising Committee

James Aird ● David Alexander ● Adlyka Annuar ● Richard Bower ● Agnese Del Moro ● Poshak Gandhi ● Chris Harrison ● George Lansbury ● Manolis Rovilos ● Flora Stanley ● Mark Swinbank

Venue and Locations

Oral presentations	Kingsley Barrett Lecture Theatre, top floor of the Calman Learning Centre at Durham University
Posters, coffee & Sunday evening buffet reception	Derman Christopherson Room, adjacent to the Kingsley Barrett Lecture Theatre (Calman, top floor)
Breakfasts	Collingwood College and Durham Business School
Lunches	Derman Christopherson Room, adjacent to the Kingsley Barrett Lecture Theatre (Calman, top floor)
Public lecture by Jenny Greene	Centre for Life - Newcastle
Workshop photograph & dinner	Durham Castle
Prince Bishop boat cruise	The Boathouse, Elvet Bridge
Hadrians Wall excursion	Pick up outside Physics building (Rochester)
End of workshop BBQ	Physics building (Rochester) quadrangle

Presentation Information

Talks – Review talks are 35+5 minutes and the invited and contributed talks are 17+3 minutes. We request that all speakers provide us with their talk on a thumb drive in advance of their presentation to avoid any technical issues.

Posters – Posters are displayed for the duration of the workshop in the Derman Christopherson Room. The poster boards allow up to standard-sized posters (A0 or 36 x 48 inches); because of limited space, standard-size posters must be orientated vertically. All presenters have the option to give a 1 min oral presentation of their poster.

Invited Speakers and Discussion Leaders

James Aird ● Almudena Alonso-Herrero ● Frederic Bournaud ● Richard Bower ● Francoise Combes ● Ric Davies ● Chris Done ● Jared Gabor ● Jenny Greene ● Chris Harrison ● Ryan Hickox ● Dale Kocevski ● Matt Lehnert ● James Mullaney ● Amelie Saintonge ● Clive Tadhunter ● Robert Thacker ● Tom Theuns ● Sylvain Veilleux ● Vivienne Wild

Twitter

We encourage you two Tweet throughout the conference using #agnsf2014.
Our account is: @AGNvsSF_2014.

Workshop Programme

Sunday 27th July 2014

6.00–8.00 **Evening Reception: top floor of the Calman Learning Centre**

Monday 28th July 2014

8.00 **Registration**

9.00 **Scientific Motivation of the Workshop (Alexander)**

9.20 **Session A "Evidence", block 1** – *Chair: Alexander*

Hickox [R]	The SF-AGN connection: does AGN activity follow or prevent star formation?
Ciesla	AGNs and host galaxies: the constraints on their physical properties from panchromatic SED fitting
Hatziminaoglou	AGN and starburst signatures in the mid- and far-IR

10.45 **Coffee Break and Poster Session**

11.30 **Session A "Evidence", block 2** – *Chair: Ward*

Shimizu	Measuring the starburst-AGN connection with an unbiased low redshift sample
Rosario	Star-formation in powerful and obscured AGN
Chen	Obscuration and star formation in luminous quasars
Magliocchetti	Far-infrared properties of radio-selected AGN

1.00 **Lunch**

2.00 **Session A "Evidence", block 3** – *Chair: Wilkes*

Azadi	The connection between star formation rate and AGN activity
Vito	Black hole accretion preferentially occurs in gas rich galaxies
Juneau	AGN triggering in star-forming galaxies and its break-down at late times
Reines	AGN and star formation in dwarf galaxies

3.30 **Coffee Break and Poster Session**

4.15 **Session A "Evidence", block 4**

Poster talks for session A (Chair: Hainline)
Discussion session A (Chairs: Aird & Mullaney)

5.30 **End**

7.00 **Prince Bishop Boat Cruise and Dinner**

Workshop Programme

Tuesday 29th July 2014

9.00 **Session B "Feeding", block 1** – *Chair: Gandhi*

Combes [R]	Gas flows
Davies	Where do Seyferts get their gas?
Zanella	AGC: Active Galactic Clumps?

10.30 **Coffee Break and Poster Session**

11.15 **Session B "Feeding", block 2** – *Chair: Villforth*

Saintonge	The role of molecular gas in feeding star formation and AGN activity
LaMassa	Investigating the AGN/star-formation connection in local obscured AGN
Kocevski	Insights on the AGN-galaxy connection at z≈2 from CANDELS
Lackner	Double yolk galaxies: late-stage galaxy mergers in COSMOS

12.45 **Lunch**

2.00 **Session B "Feeding", block 3** – *Chair: Del Moro*

Alonso-Herrero [R]	Connecting the AGN and SF phenomena on nuclear scales
Blank	Viscous time lags between starburst and AGN activity
Bauer	Probing the torus structure of nearby AGN

3.30 **Coffee Break and Poster Session**

4.15 **Session B "Feeding", block 4** – *Chair: Rovilos*

Wild	Tracking AGN activity following a starburst
Hampton	The nature of composite galaxies
Thacker	AGN feedback models: correlations with star formation and observational implications of time evolution
Dubois	BH growth and the impact of AGN feedback on galaxy evolution

5.45 **End**

6.30-9.00
Public Talk by Jenny Greene: "Tiny But Powerful: The Smallest Supermassive Black Holes"
A public event at the Centre for Life in Newcastle that will also include a planaterium show and a talk by Gary Fildes (director of Kielder Observatory). Anyone wishing to attend will need to make their own way to Newcastle (≈15 minutes on the train).

Workshop Programme

Wednesday 30th July 2014

9.00 **Session B "Feeding", block 5**

Poster talks for session B (Chair: Hainline)
Discussion session B (Chairs: Davies & Gandhi)

10.15 **Coffee Break and Poster Session**

10.45 **Session C "Impact", block 1** – *Chair: Croom*

Lehnert [R]	What impact does AGN activity have on star formation?
Veilleux	Powerful neutral atomic and molecular outflows in nearby active galaxies
Colina	The multi-phase view of gas outflows in low-z U/LIRGs

12.15 **Free afternoon or Hadrians wall excursion**

7.30 **Conference drinks and group photo**

8.00 **Conference dinner**

10.00 **Entertainment from The George Lansbury Project**

Durham Castle Bar

Workshop Programme

Thursday 31st July 2014

9.00 **Session C "Impact", block 2** – *Chair: Barthel*

Harrison	Observational constraints on the influence of luminous AGN on star formation using multiple approaches
Barger	Suppressed star-formation in X-ray luminous AGN
Lutz	AGN driven nuclear outflows in massive star-forming galaxies
Marconi	Fast outflows quenching star formation in quasar host galaxies

10.30 **Coffee Break and Poster Session**

11.15 **Session C "Impact", block 3** – *Chair: Vignali*

Mainieri	Testing AGN impact on star formation from the SFR-$M_\star$ plane
Tadhunter	Star formation in powerful radio galaxies
Bower [R]	Black holes and the star formation history of the Universe

12.45 **Lunch**

2.00 **Session C "Impact", block 4** – *Chair: Lacey*

Gabor	Simulating AGN fueling and feedback in high-redshift disk galaxies
Zubovas	Positive AGN feedback on turbulent ISM
Hirschmann	Cosmological simulations of BH growth: AGN luminosities and the connection to their host galaxies
DeGraf	Impact of bursty black hole accretion and feedback on host galaxy formation

3.30 **Coffee Break and Poster Session**

4.15 **Session C "Impact", block 5** – *Chair: Blain*

Fanidakis	AGN - star formation correlation in a universe with AGN feedback
Furlong	Evolution of AGNs in hydrodynamical simulations
Theuns [R]	AGN implementations in cosmological simulations

5.45 **End**

Workshop Programme

Friday 1st August 2014

9.00 **Session C "Impact", block 6**

Poster talks for session C (Chair: Hainline)
Discussion session C (Chairs: Done & Thacker)

10.15 **Coffee Break and Poster Session**

11.00 **Concluding Session** – *Chair: Hickox*

Greene [R] | Future experiments
Workshop wrap up

12.30 **End of workshop BBQ**

Poster Programme

Posters are displayed throughout the workshop in the coffee area (Derman Christopherson Room). The numbers given below refer to the board on which each poster is displayed. Session A is "Evidence", session B is "Feeding", and session C is "Impact".

Blain	A1	The overdense environment of SMGs around WISE-selected AGNs
Carroll	A2	Modeling Obscured Quasar SEDs with Linear Least Squares Fitting
Gurkan Uygun	A3	The connection between star-formation and AGN activity in radio-loud and radio-quiet active galaxies
Jones	A4	Testing the star formation-AGN connection with SDSS
Matsuoka	A5	Comparing AGN and SF Luminosities of Local Active Galaxies using Multi-Wavelength Data
Mingo	A6	Radio-loud AGN through the eyes of 3XMM, WISE and FIRST/NVSS
Oti-Floranes	A7	X-rays in Seyfert 2 Galaxies: Disentangling Nuclear Activity and Star Formation
Podigachoski	A8	Fireworks in the early universe
Rocca-Volmerange	A9	Star Formation Laws and AGN evolution in high-z radio galaxies
Stanley	A10	Constraining the SFRs of galaxies hosting an AGN: Is Star Formation dependent of AGN power?
White	A11	Radio-Quiet Quasars in the VIDEO Survey: Evidence for AGN-powered radio emission below 1 mJy
Woo	A12	AGN and star formation in X-ray selected galaxy groups at $0.5 < z < 1.1$

Annuar	B1	Towards A Complete Census of Compton-thick AGN and $N_{\rm H}$ Distribution in the Local Universe
Bessiere	B2	The stellar populations of type II quasar host galaxies
Chies Santos	B3	AGN in A901/902 from the OMEGA survey
Fan	B4	Structure and morphology of massive galaxies at high redshift revealed by HST/WFC3
Frank	B5	HI and AGN Morphology in NGC 3998
Lansbury	B6	Studying the Cosmic X-ray Background Population with NuSTAR
Lin	B7	Dense Molecular Gas in Nearby Seyfert Galaxies
Richardson	B8	The physical reason for the variation in AGN and star forming galaxy emission line spectra
Rovilos	B9	SED decomposition of SDSS galaxies
Schulze	B10	The cosmic growth of the active black hole population
Vignali	B11	Obscured accretion and star formation at $z \approx 1$
Villforth	B12	Triggering Active Galactic Nuclei from Seyferts to Quasars: Do mergers matter?
Weigel	B13	The systematic search for $z > 5$ AGN in the Chandra Deep Field South

Cashmore	C1	High Resolution Simulations of SN feedback in Dwarf Spheroidals
Croom	C2	Spatially resolving the AGN/star-formation connection
Feldmann	C3	Massive Galaxies in their Prime - Mass Accretion and Star Formation at and above $z \approx 2$
Hainline	C4	The Immense Sizes and Disturbed Kinematics of Obscured Quasar Narrow-Line Regions
Husemann	C5	Quenching of star formation in Seyfert galaxies and luminous QSO hosts
Morselli	C6	Mass versus environment quenching in the SFR-stellar mass plane
Newton	C7	Simulations of AGN and SN in disc galaxy mergers
Rashed	C8	High resolution observations of SDSS J080800.99+483807.7 in the optical and radio domain: A possible example of jet-triggered star formation
Roos	C9	The limited impact of AGN radiation on Star Formation
Saturni	C10	Absorption variability in the outflowing gas of the broad-absorption line quasar APM 08279+5255
Wurster	C11	How does an AGN subgrid model affect a galaxy merger?