

Workshop wrap up: Alexander & Hickox



**Thanks to the twitterati for a
workshop summary
(particularly Beatriz Mingo)!**

"THE GREATEST FIGHT IN THE HISTORY OF THE UNIVERSE"

DURHAM UNIVERSITY
Presents

THE FATE OF THE GAS IN GALAXIES



AGN

VS.

STAR FORMATION

28 JUL
to
1 AUG
2014

Ringside seats
limited to 70 people
Don't miss it!

**INTERNATIONAL
WORKSHOP
DURHAM
UK**

D Alexander A Alonso-Herrero R Morganti
R Hickox F Bournaud J Mullaney
T Theuns R Davies R Somerville

**SCIENTIFIC
ORGANISING
COMMITTEE**

**LOCAL
ORGANISING
COMMITTEE**

J Aird P Gandhi
A Annuar C Harrison
R Bower G Lansbury
A Del Moro E Rovilos

F Stanley
M Swinbank



Dartmouth

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

Image credit: ESO/M. Kornmesser; NASA/ESA/Hubble/STScI/Institut d'Astrofísica de Space

It is a draw!

...maybe

...well we don't know



At conferences we feel we learn more... at workshops we realise how little we know...



...and these little devices have shown us how little we agree on!



A common phrase at the workshop “I am not yet convinced...”

Q1: What evidence is there for a symbiotic connection between AGN activity or star formation?

Black-hole-bulge relationships?

don't agree: 8 moderately agree: **63** strongly agree: 30

Volume average/cosmological accretion and star formation rate densities?

don't agree: 11 moderately agree: **61** strongly agree: 27

Theoretical models?

don't agree: 14 moderately agree: **73** strongly agree: 7

...and, indeed, here is the evidence.



But we are scientists and so we should need more than “belief” – we need proof. The questions we asked were not simple!

Some of what we have learnt



“It is all about the gas.” – Rosario

“For those doing X-rays, this won’t make you happy, because you’ll have to redo all your work. You are all wrong.” – Bauer

“When we submitted this paper the referee said: this is great, but how do I know it makes any physical sense?” - Thacker

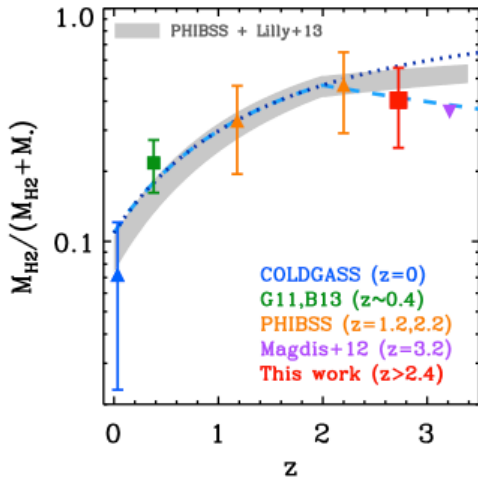
“Relationship between galaxy and black holes is not symbiotic, it is parasitic. Black holes are nasty, they kill their hosts. You don’t want to live in a black hole.” - Bower

“I’m really going for confusion, more than clarity” - Lehnert

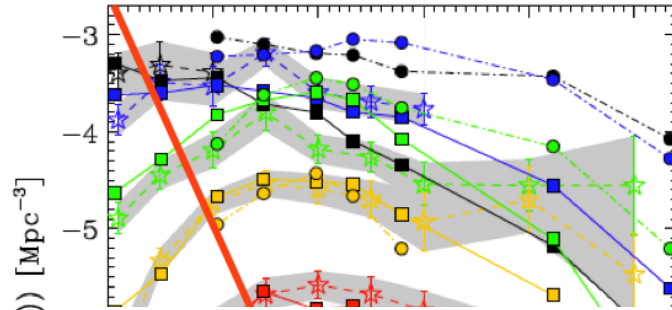
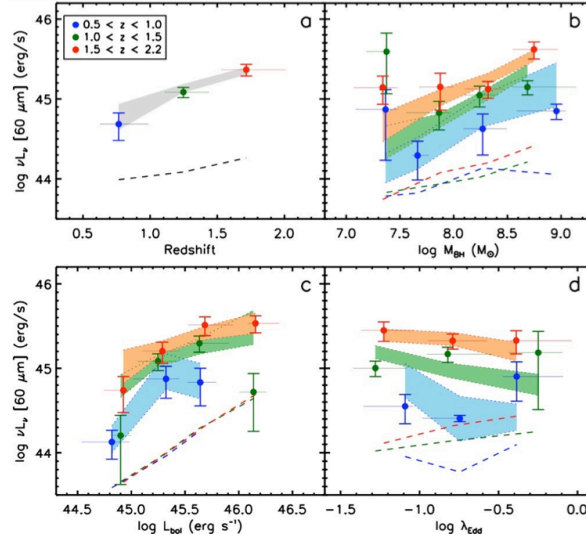
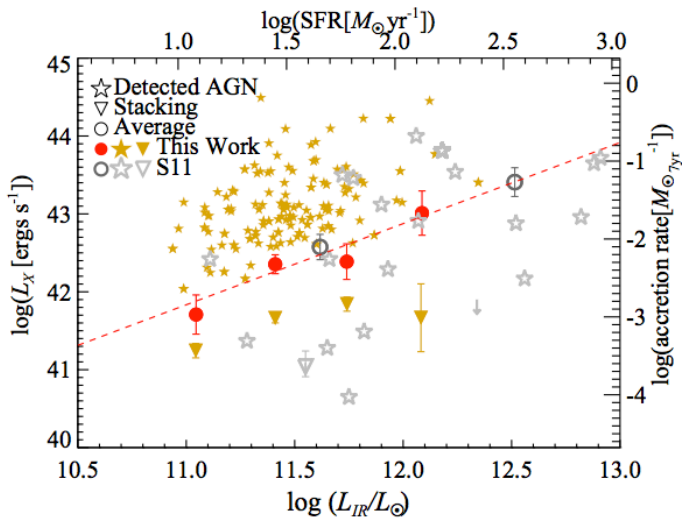
“Ambiguous view on M-sigma relationship these days: everybody bases work on it but nobody believes it has any relevance.” – Greene

Thanks for the great tweets, particularly Beatriz Mingo!

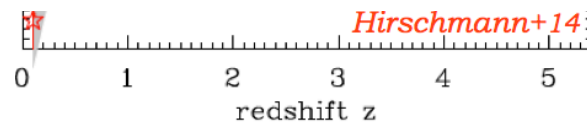
The wide view: Everything is simple?



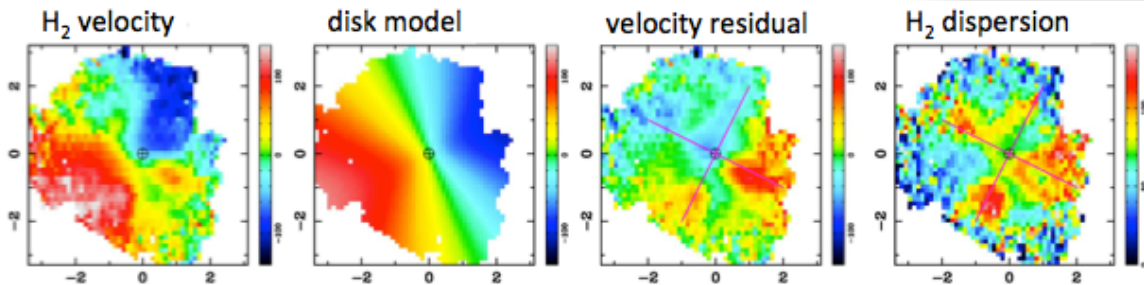
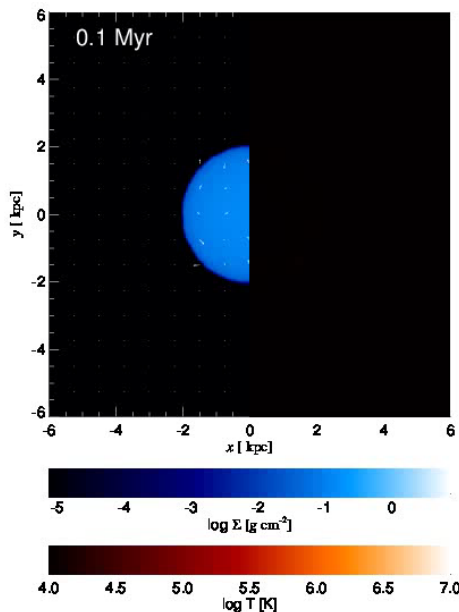
Cosmic evolution of SSFR
(and BH accretion?) driven
by evolving gas fractions



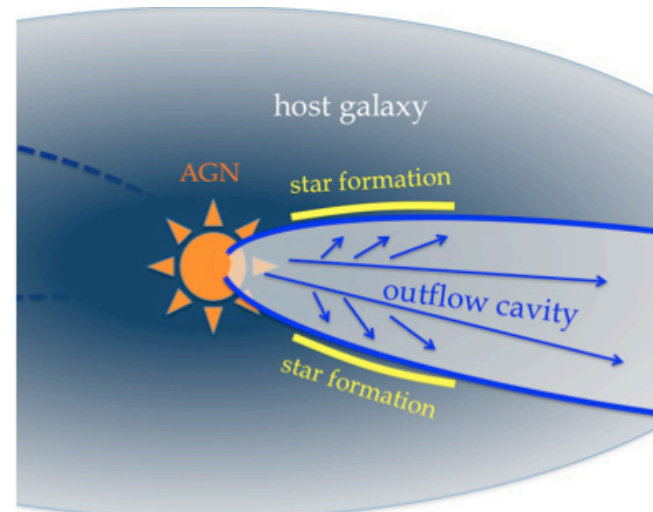
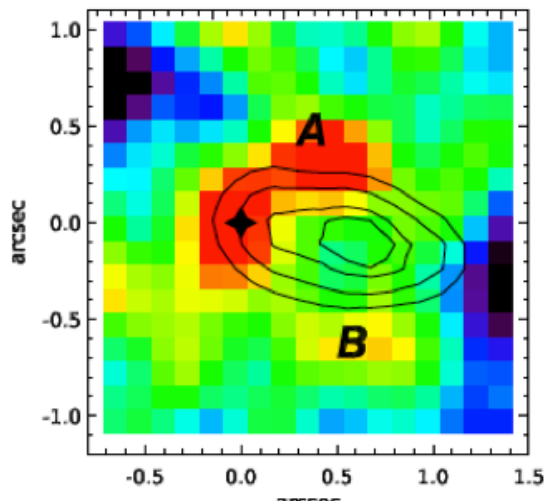
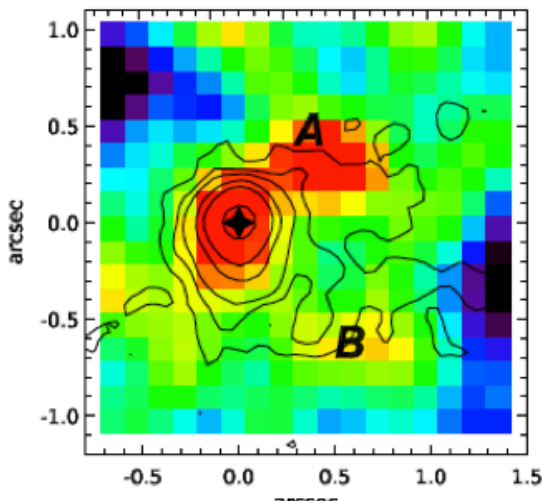
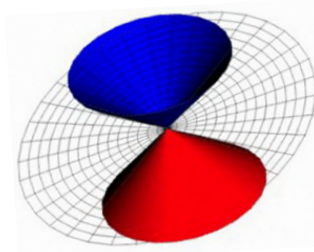
*The simplified scheme
of BH accretion is able
to capture the essence
of BH growth in reality*



The zoomed-in view: Everything is complicated?



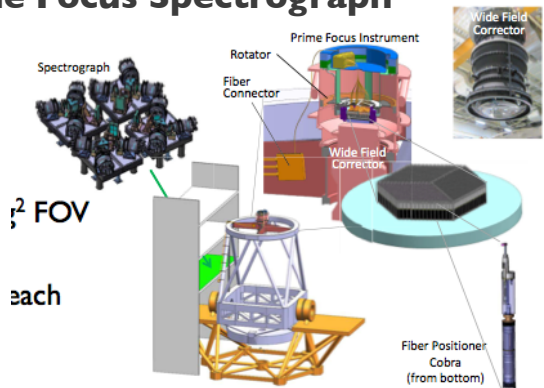
Outflows + Inflows
Hot + Cold Gas
Positive + Negative Feedback



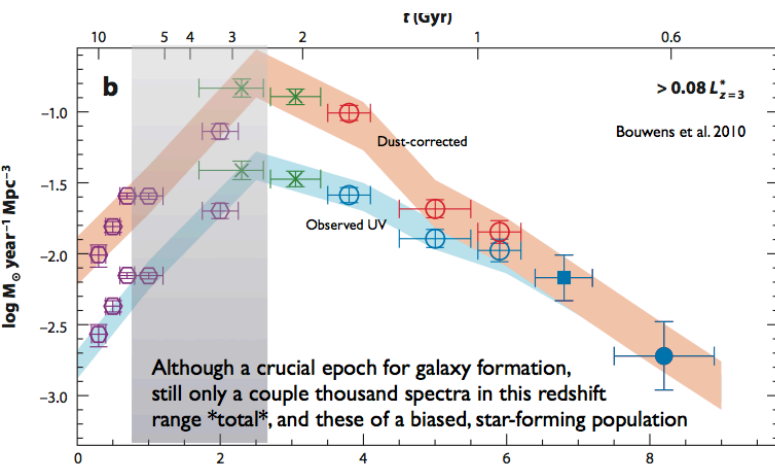
Everything is simple?



Prime Focus Spectrograph



EAGLE



New galaxy+AGN surveys, especially at high z

Everything is complicated?

New simulations with better treatment of AGN+ISM

Workshops are also about building things



So what have we built?



...no

...we have built the foundations



Prophetic insight from the catering staff?

AGN vrs Star Foundations Conference Dinner

The Great Hall

Wednesday 30th July 2014

Thanks for an enjoyable workshop



...enjoy the “BBQ”, have a safe trip home, and we hope to see you at the next one!