



bla  
bla



Students

1 min  
talks

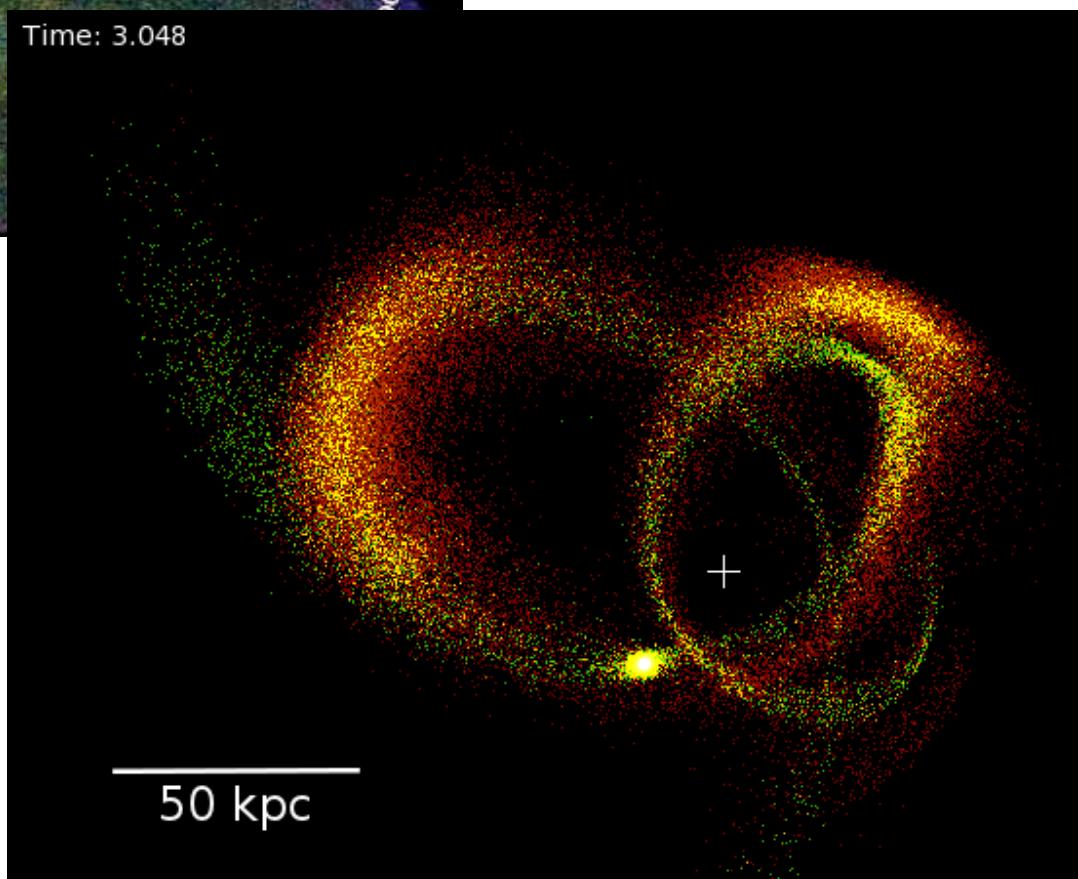
# Simon Gibbons



*Field of Streams ( Belokurov et. al. 2006 )*

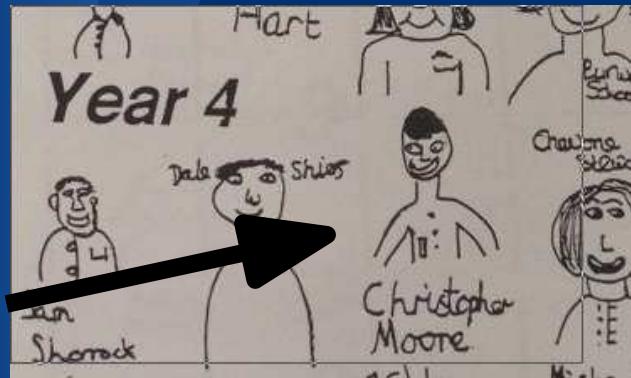
## Skills

- Python
- C / C++ (and getting them to talk to Python)
- LaTeX
- Running MCMCs using emcee
- Colloquium Wine
- Computer Users Committee



Me: Christopher Moore

Supervisor: Dr Jonathan Gair



# Gravitational Waves

## Science:

- Gravitational waves
- Populations of black holes

## Computing:

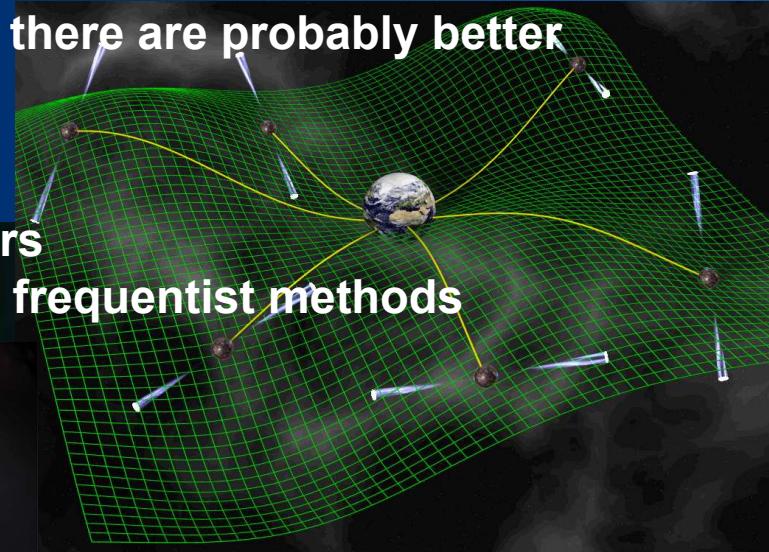
- Mathematica
- a bit of c and c++... but there are probably better people around

## Maths:

- GR, so hopefully tensors
- Statistics, Bayesian Vs frequentist methods

## Other:

- Squash



# Scott Thomas

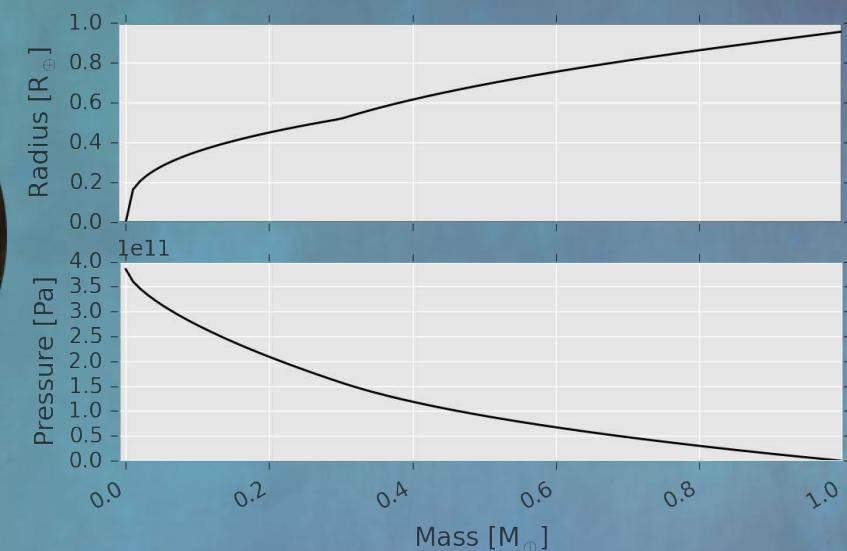
Nikku Madhusudhan

Equations of state  
Planetary structure  
Rocks and ice  
ODEs & numerics



**Python** (matplotlib, cython)

(and in the past I've used Shell, Matlab, R, Fortran, C/C++; learning Julia; ask me about version control)

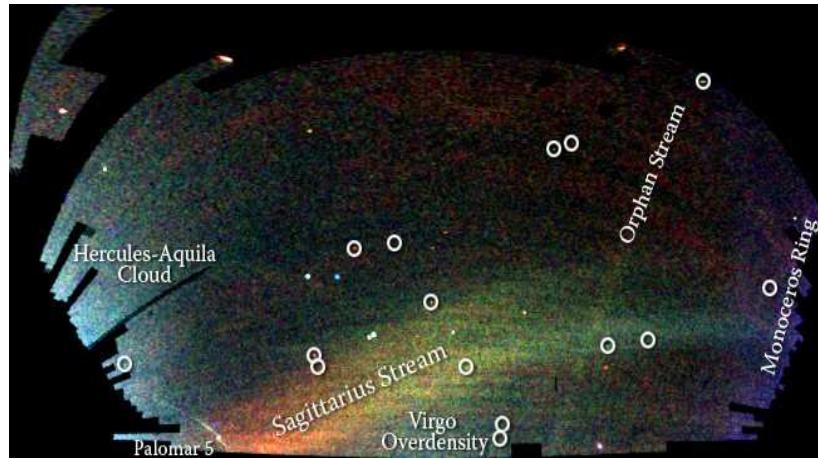


and apart from this...

hiking, cycling, learning French, music, dancing, board games, mispronouncing words like “fish”, outreach

# Local Group Dynamics & Substructure

Adam Bowden



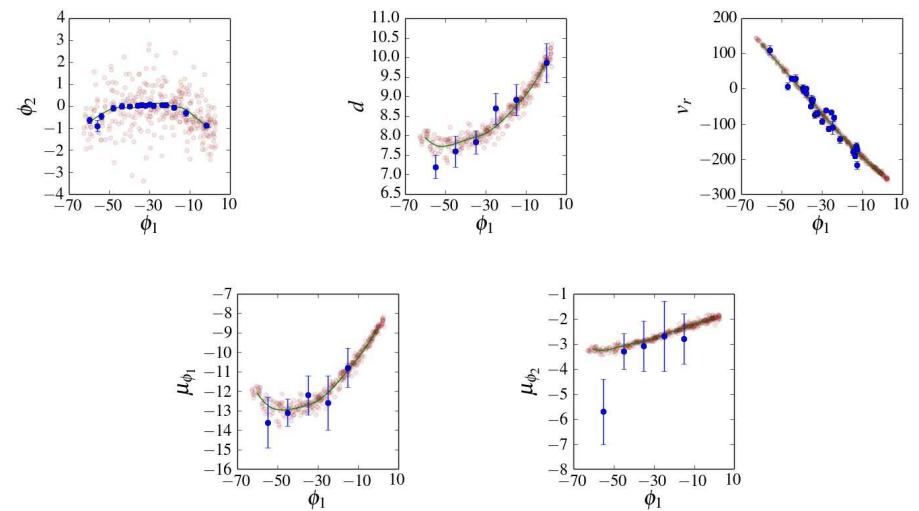
Vasily Belokurov  
Wyn Evans

Things I use:

- MCMCs
- Analytic dynamical methods
- Python/C

Things I work on:

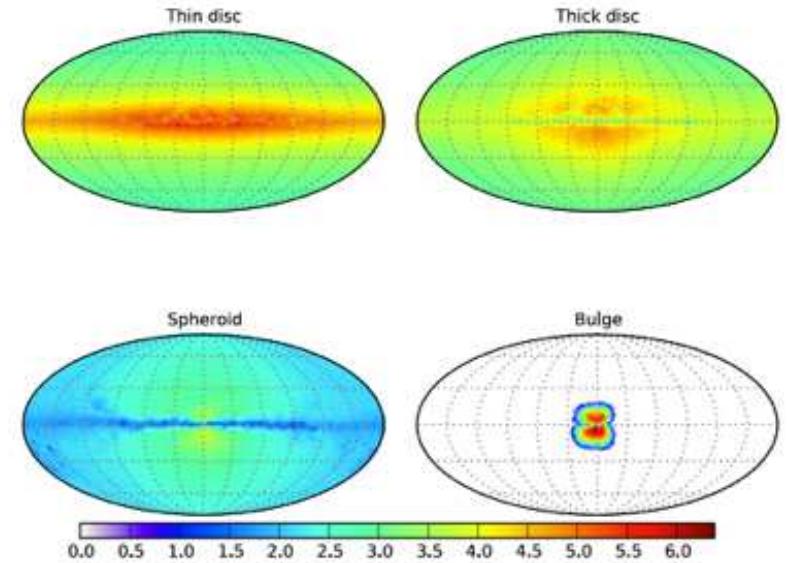
- Tidal streams
- Satellite galaxies
- Halo substructure
- Galactic dynamics



# Iulia Simion (K14)

- Research:

- structure and stellar content of inner Milky Way
- thick disc + bulge + halo substructures



- Skills:

- stellar populations synthesis codes (e.g. Galaxia, TRILEGAL, Besancon)
- CMDs, isochrones
- apply analytic models to NIR and optical large area sky surveys (e.g. SDSS, VVV)
- RR Lyrae observing, Gaia outreach for kids

# Erin Kara

3<sup>rd</sup> Year PhD Student

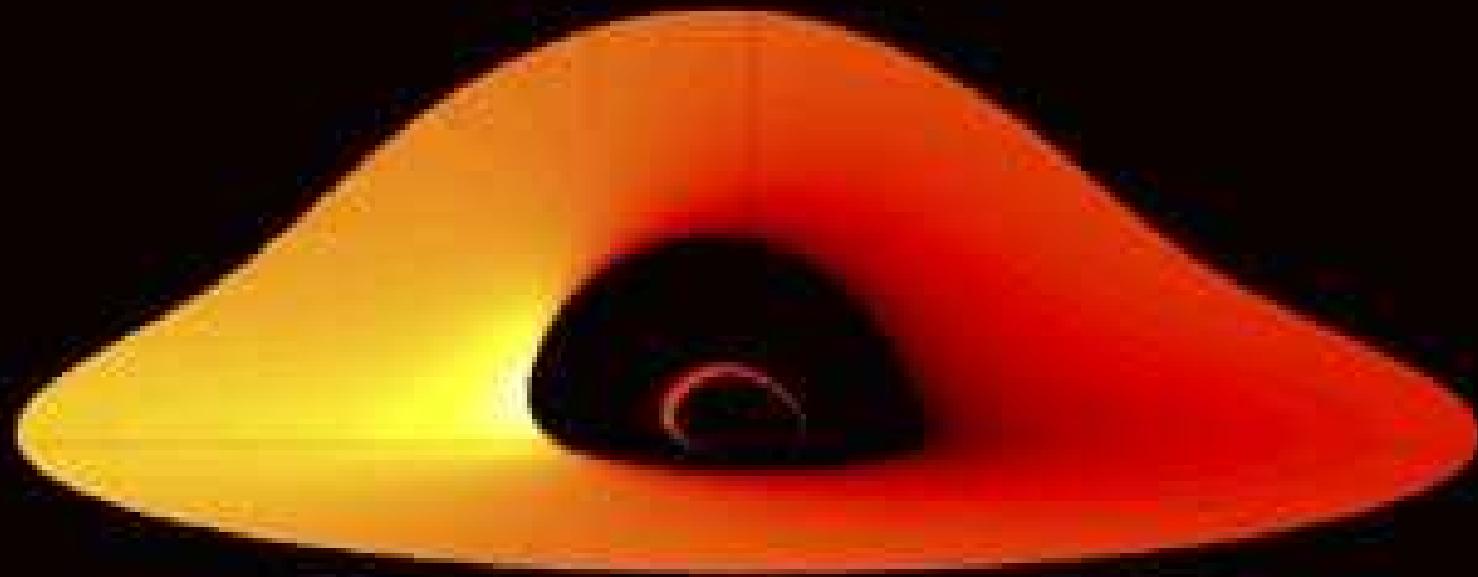
**Supervisor:** Andy Fabian

**Research Interests:**

Black hole accretion, mostly in AGN for now  
X-ray Spectral Timing (reverberation)

**Techniques:**

Fourier analysis of X-ray light curves with IDL  
X-ray spectroscopy in XSPEC  
XMM-Newton, NuSTAR and Suzaku data reduction



# Adam Stevens

PhD student, Swinburne University of Technology, Melbourne.  
At the IoA/KICC through 'til Feb 2015.

SWIN  
BUR  
\* NE \*

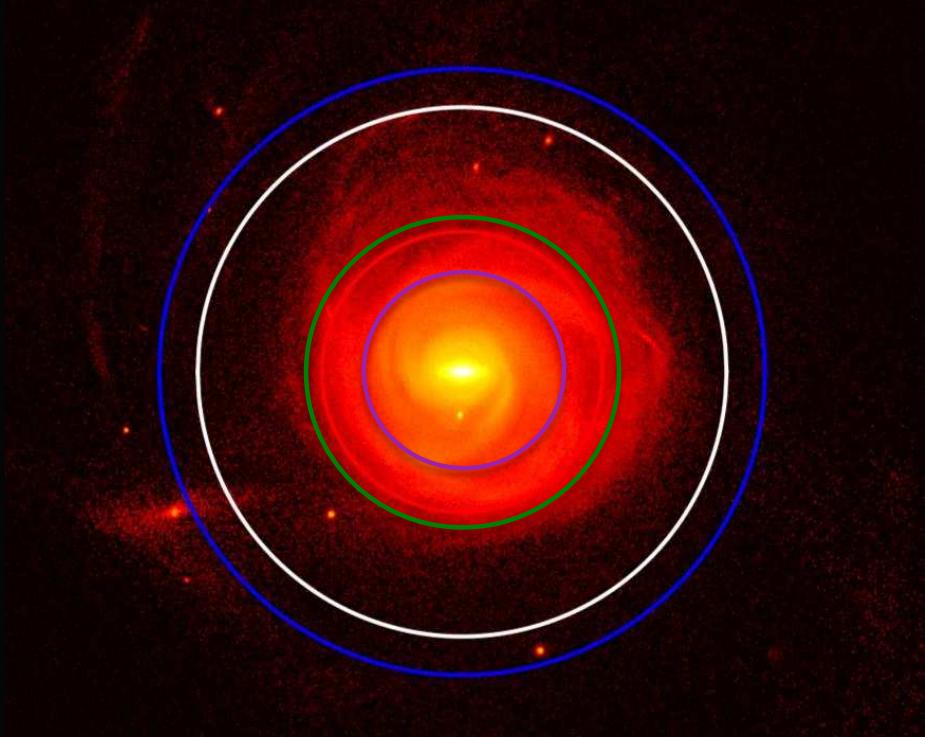
CENTRE FOR  
ASTROPHYSICS AND  
SUPERCOMPUTING

## What I've done

Post-processing of SPH simulations

Played with semi-analytic model

Addressed where galaxies end

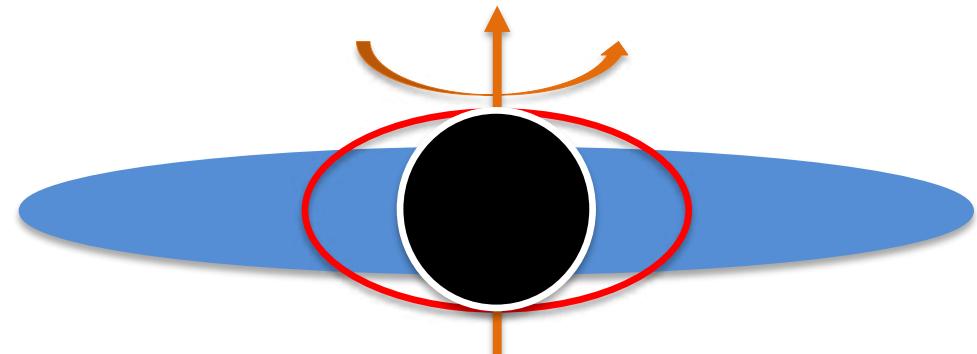


Stevens et al. (2014)

## What I'm working on

AMR simulations of isolated haloes

Self-consistent spin-dependent  
AGN feedback



Mostly code in **Python**

Can use **MATLAB**

Learning to use **Fortran**

Had interaction but fairly noob with  
**RAMSES, GADGET, AHF, SAGE,**  
**MPgrafic, DICE**

# Alvin Chua

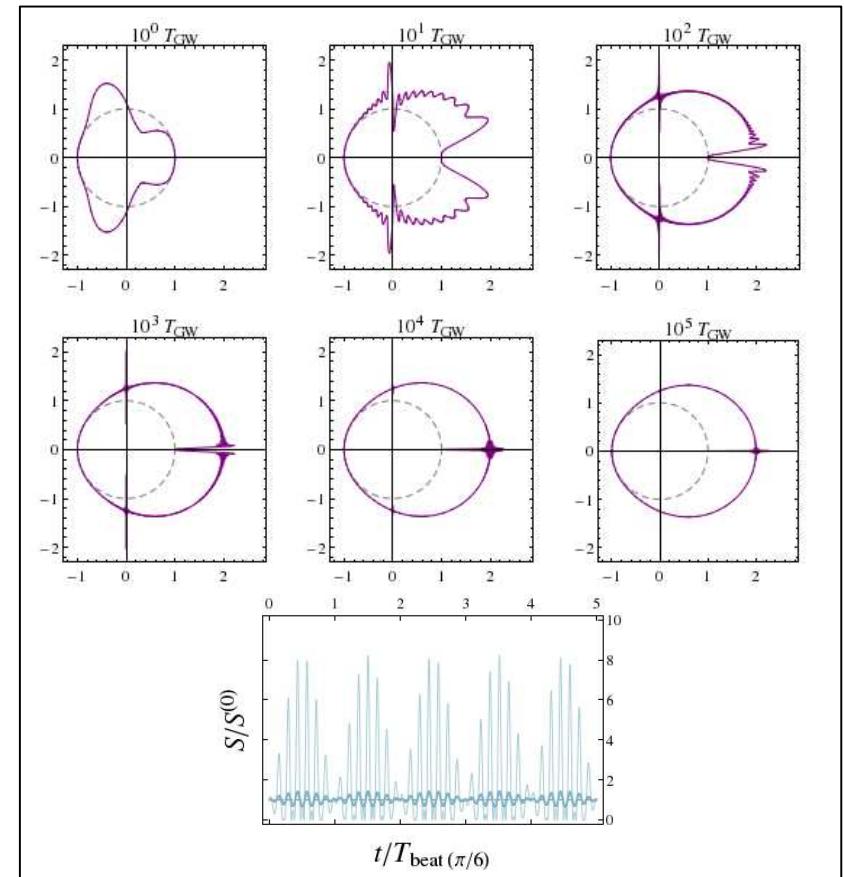
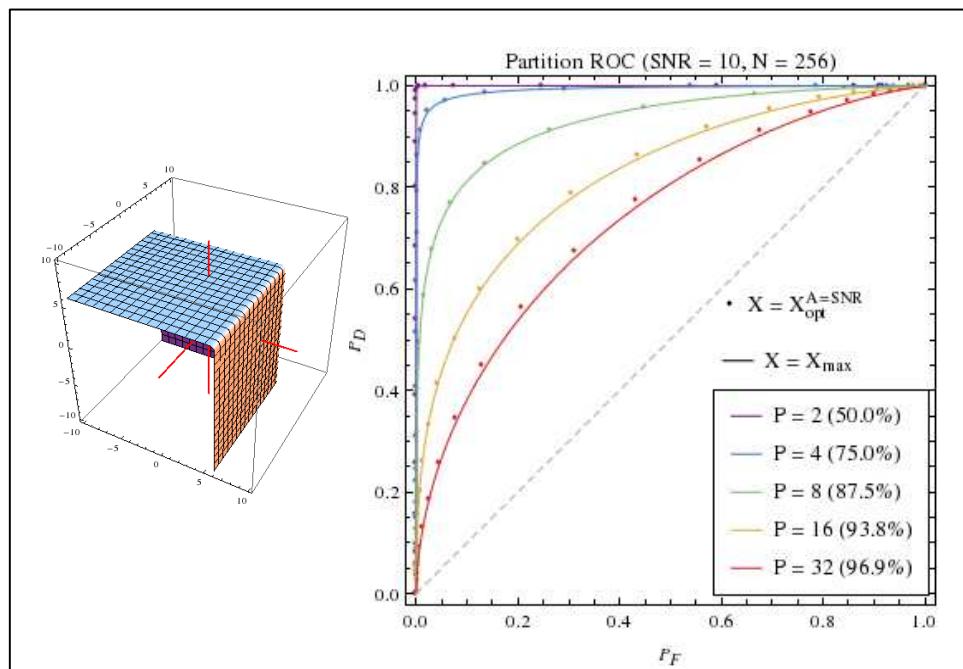
Supervisor: Jonathan Gair



## Gravitational-wave theory

Mathematical framework, source modelling & data analysis methods

- Einstein-Maxwell interactions
- Template bank compression schemes
- And other stuff, eventually



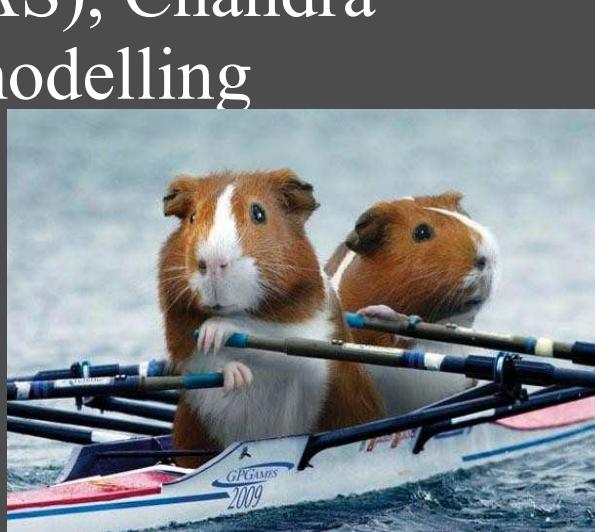
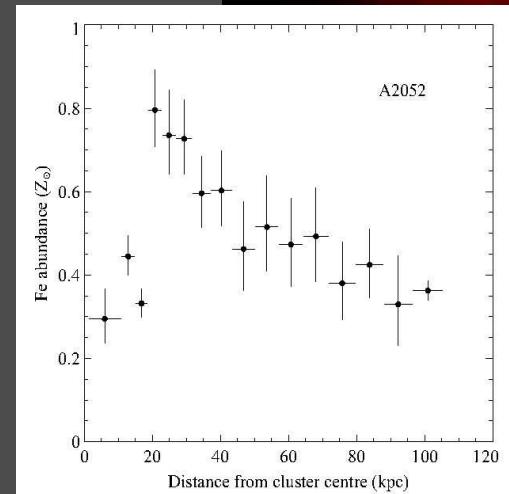
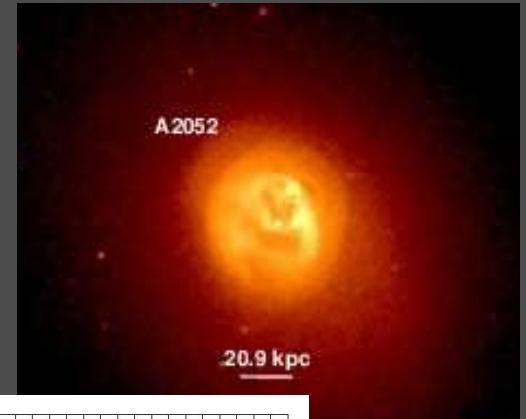
# Electra Panagoulia (H52)

## Research:

- ★ X-ray groups and clusters
- ★ AGN feedback: Cavities, entropy profiles
- ★ Metallicity profiles

## Skills:

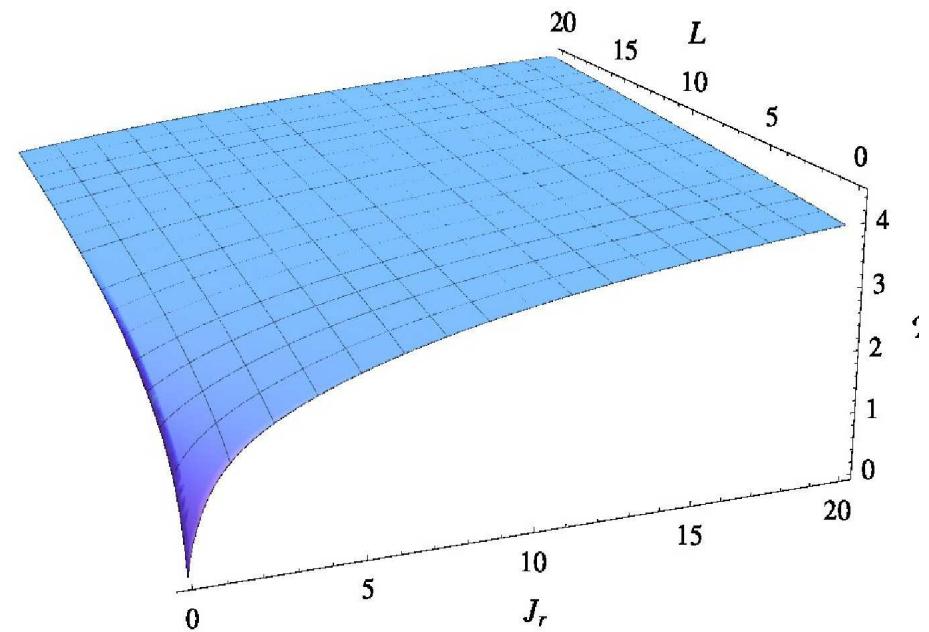
- ★ XMM-Newton (esp. ESAS), Chandra
- ★ Data + image analysis, modelling
- ★ Hacky bash shell scripts
- ★ Greece and Boston ☺
- ★ Rowing...



# Angus (Gus) Williams

- ***Supervisor:*** Wyn Evans
- ***Research Interests:***
  - Dynamical Modelling in Action-Angle coords
  - Analytical models of galaxies
  - The Bulge/Bar
  - Streams
- ***Programming languages I use:***
  - Python
  - Mathematica

(Know a bit of MATLAB, C, C++)



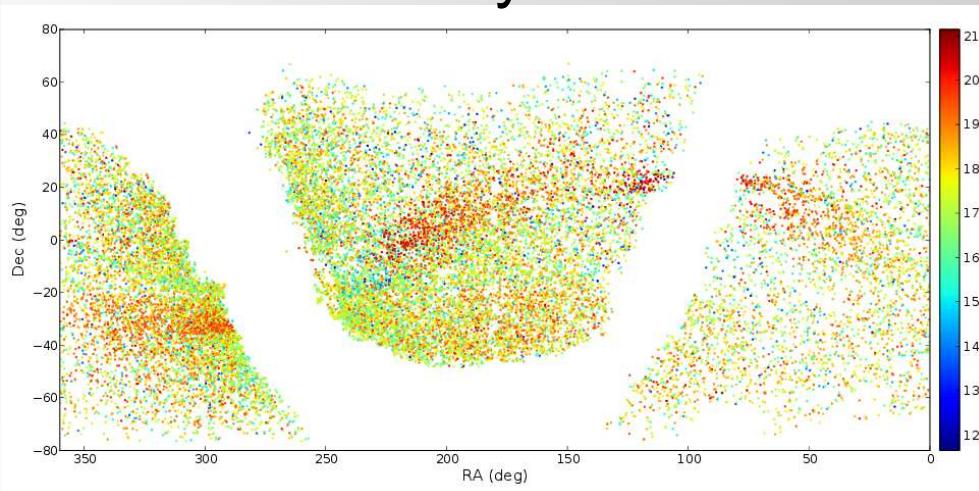
$$\mathcal{H}(L, J_r) = \frac{v_0^{2\beta/\alpha}}{r_0^{\beta}\beta} (L + DJ_r)^{\beta}$$

# The Galactic Halo as local laboratory for the Lambda CDM scenario

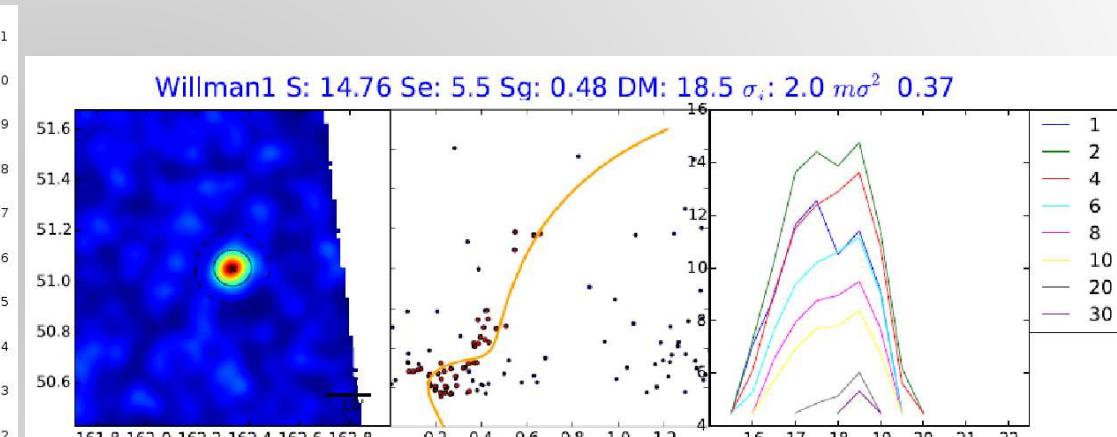
Gabriel Torrealba, Vasily Belokurov, Sergey Koposov

Characterization of the shape and substructure  
within the halo

RR Lyrae



Satellites



Catalina Surveys



Photometric Surveys



Data Mining  
Statistics

Python

C#

C++

Javascript

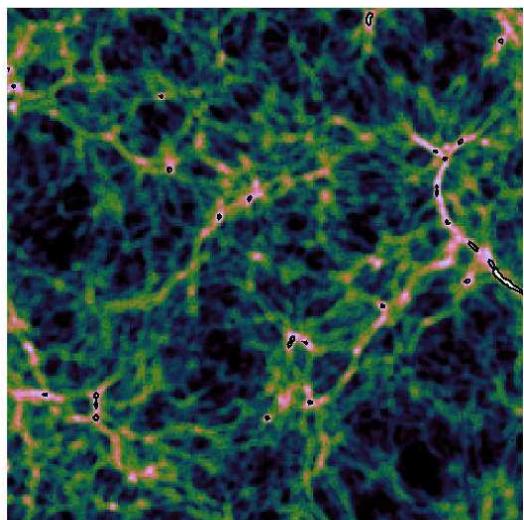
CSS

Webgl

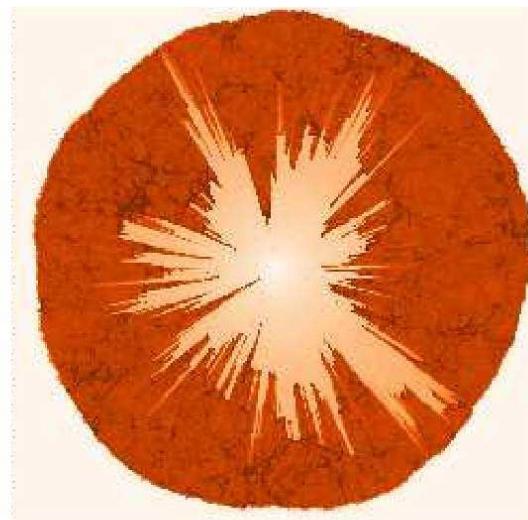


# Probing the Epoch of Reionization

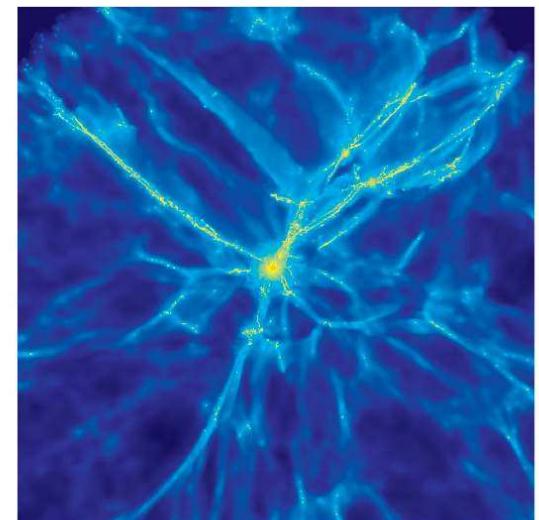
Laura Keating  
with Martin Haehnelt



Metals in the IGM  
at  $z \sim 6$



Ionization fronts  
around high- $z$  QSOs

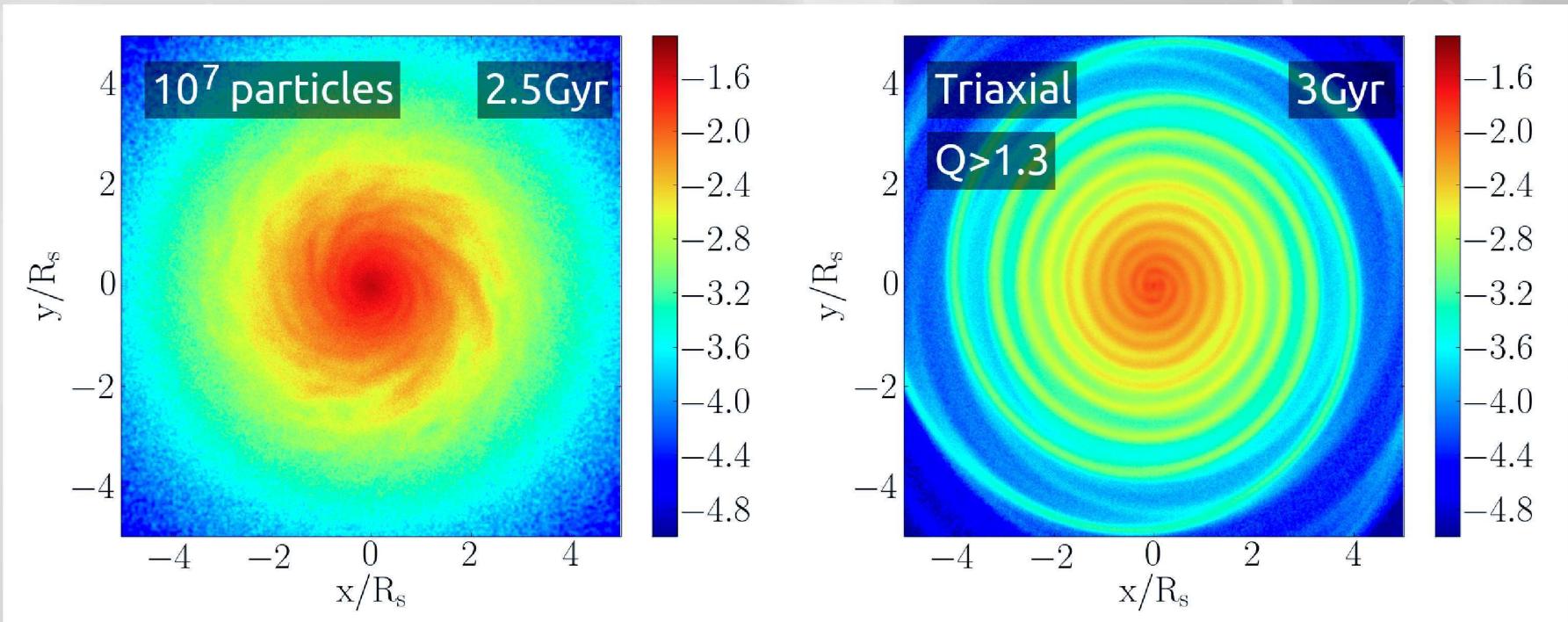


HI absorbers around  
QSO hosts at  $z \sim 3$

Hydro simulations with GADGET-3, radiative transfer with RADAMESH,  
analysis with IDL

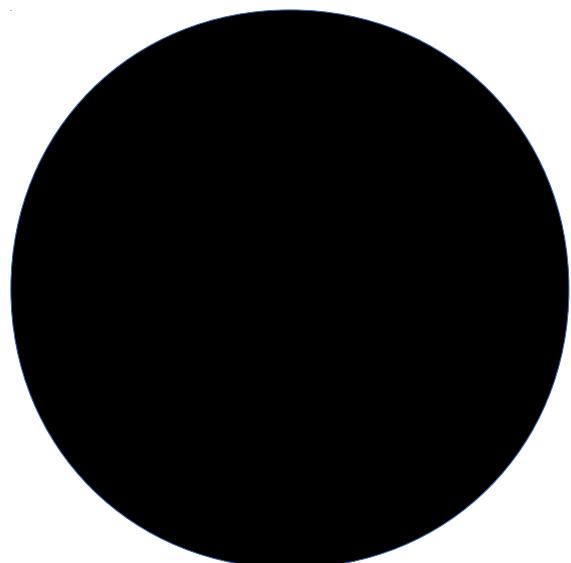
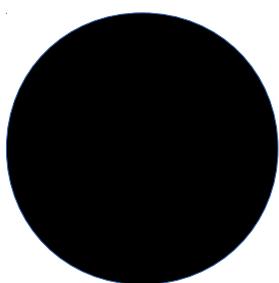
# Shaoran Hu (sh759)

- Formation of spiral structures in disk galaxies
- Simulations with GADGET-3
- Supervised by Dr Debora Sijacki



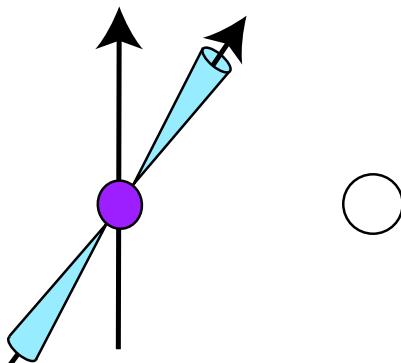


# Harley Katz's Ph.D



# Binary Star Evolution - Sarah Smedley

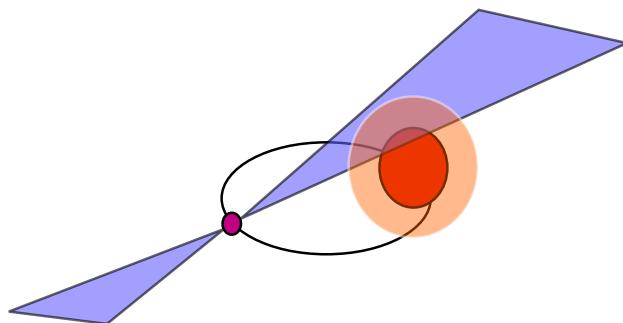
## Formation of millisecond pulsars with He-white dwarf companions



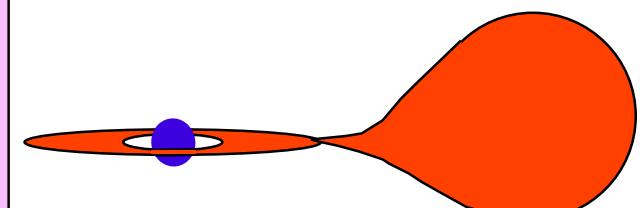
I've studied the nature of the observed population of millisecond pulsars with helium-core white dwarf companions. I made detailed stellar evolution models of the formation of such systems with the Cambridge STARS code. I studied the case where these systems are formed via Roche lobe overflow from a close companion.

## The formation of black widow and redback pulsars

I've studied a formation scenario of the newly discovered and exotic redback pulsars. They are millisecond pulsars in close binary systems with heavily ablated main-sequence companions. I studied the case where the systems are formed from cataclysmic variables. Accretion onto the white dwarf can cause it to collapse to a neutron star which stops the Roche lobe overflow and turns on the pulsar beam - so forms a redback.



## Mass transfer details in close binaries during Roche lobe overflow



I'm currently working on the details of Roche lobe overflow of low-mass subgiants and giants onto neutron stars. I'm looking at the effect that tides have on the mass transfer and orbital parameters of the systems. I'll apply my findings to millisecond pulsars with He-core white dwarf companions.

Supervisor: Chris Tout

Aimée Hall - aehall@ast.cam.ac.uk -  @astronaimee

NGTS

SuperWASP

Improving Precision

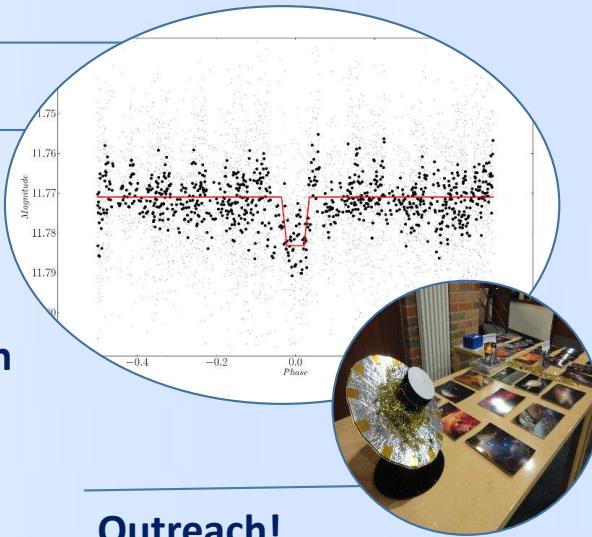
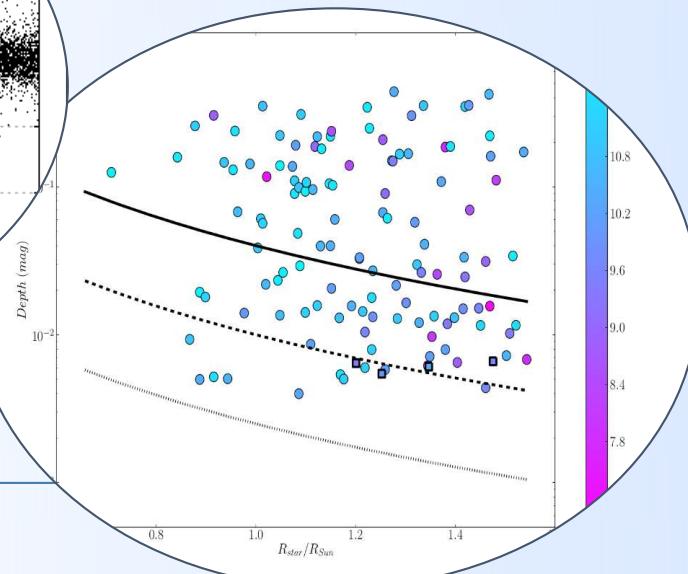
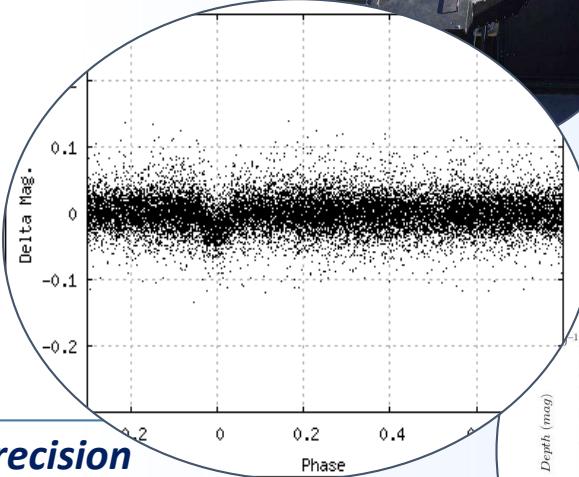
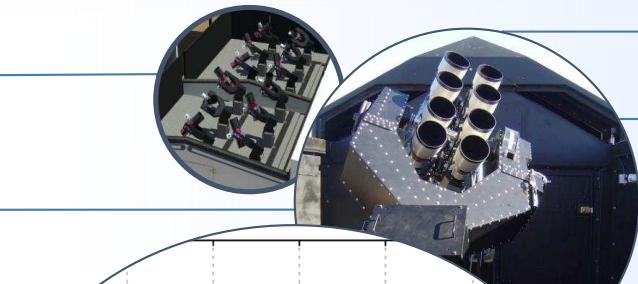
*Smaller planets around brighter stars*

## Exoplanet Transits

Data Reduction  
Pipeline (Python)

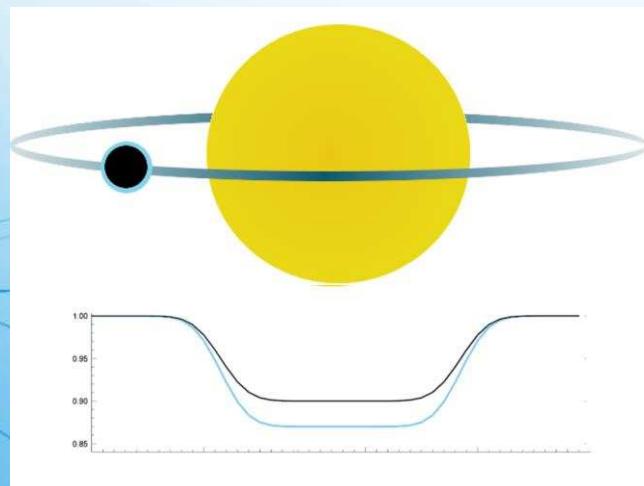
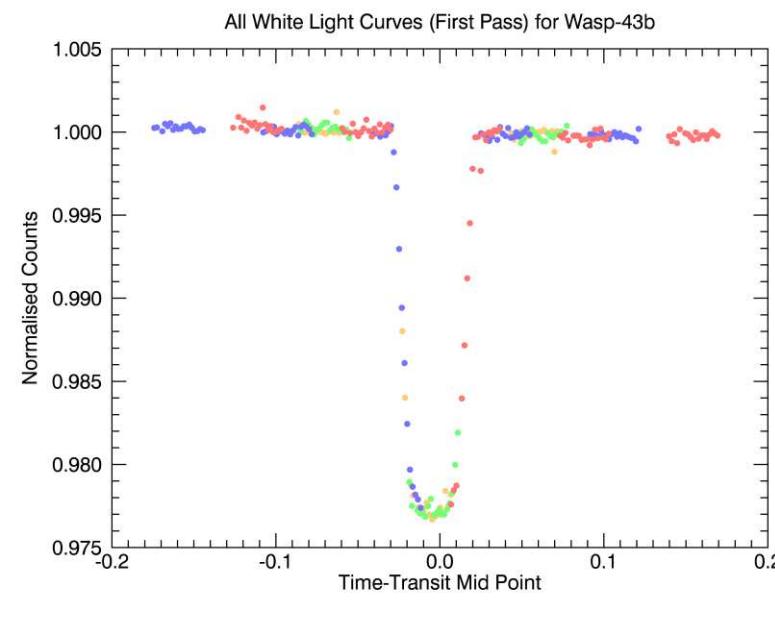
Detection

Outreach!



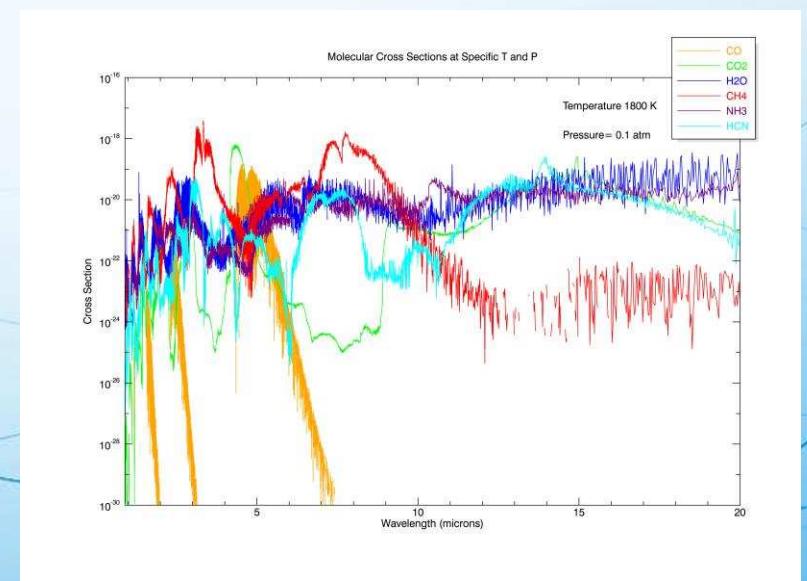
# Christina Hedges

(H27) chedges@ast.cam.ac.uk



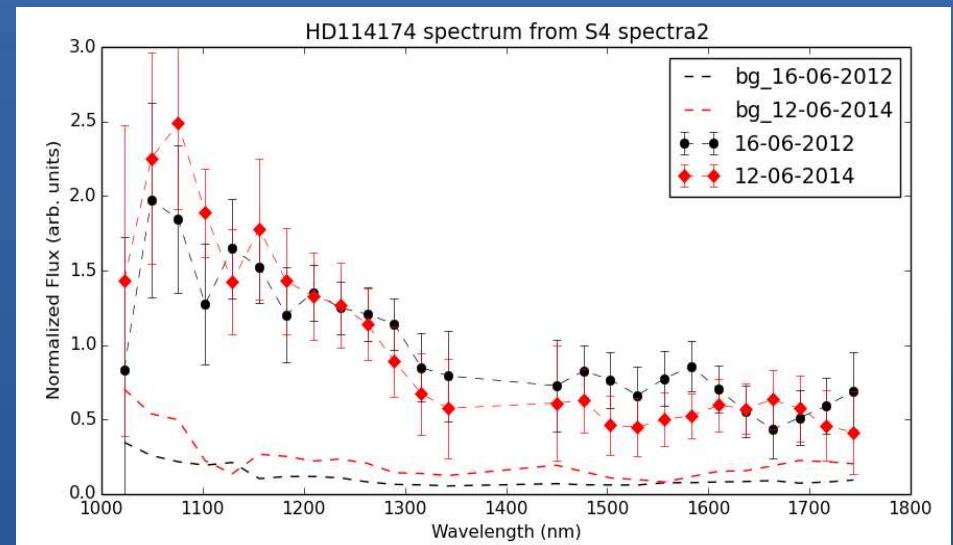
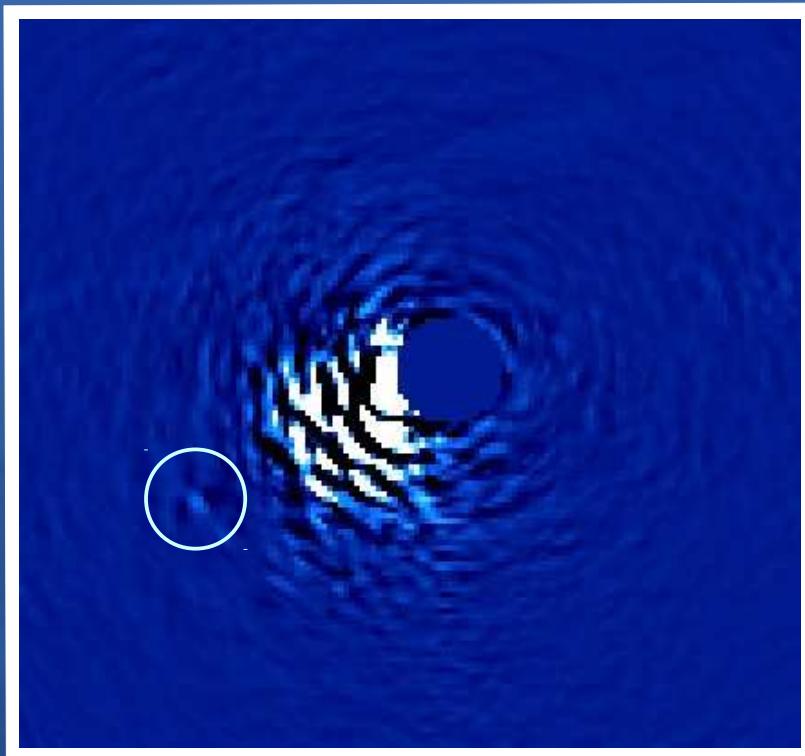
**Supervisor: Nikku Madhusudhan**

**Buzz Words:**  
Exoplanets, Atmospheres,  
Transmission Spectroscopy, Hot  
Jupiters, HST, Reduction  
**Codes**  
IDL, C++



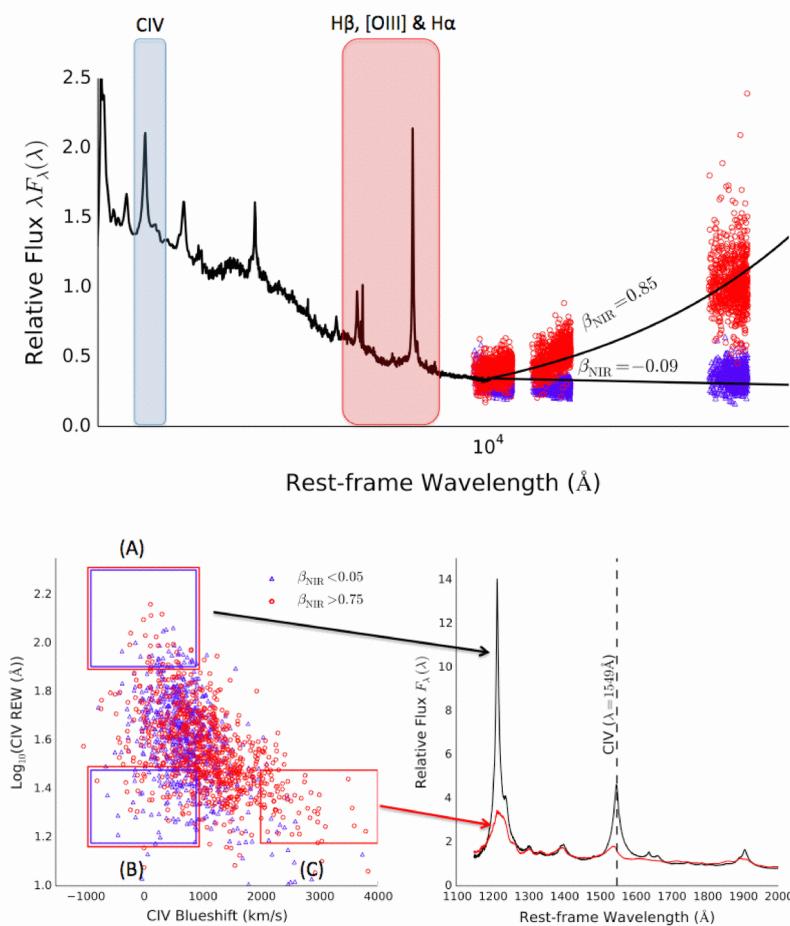
# Eleanor Bacchus

- High contrast imaging and spectra of Exoplanets
- Habitability and biosignatures
- Data reduction, data analysis and pipeline testing with Project 1640



# Liam Coatman – Ic585@...

## Using Multi-Wavelength Spectral Energy Distributions to Constrain the Evolution of Active Galactic Nuclei



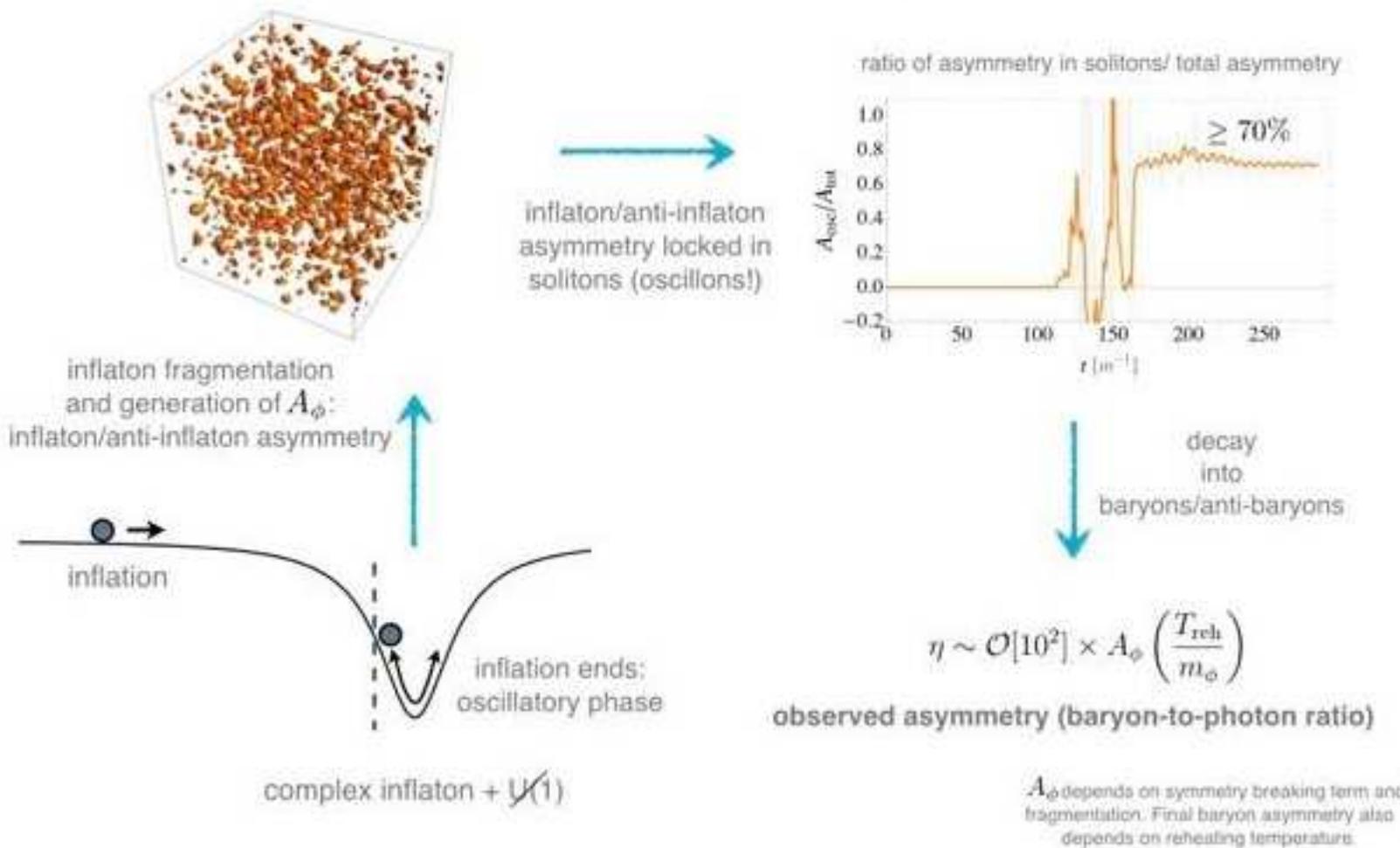
- Constraints on competing models for the structure and evolution of the central regions of AGN using the statistical properties of large samples of objects.
- Developed a parametric model for AGN SEDs which allows me to study the evolution of object characteristics as a function of fundamental parameters such as redshift and luminosity.
- I use photometric data from optical and NIR surveys (SDSS, UKIDSS and WISE), combined with spectroscopic data from the SDSS and BOSS surveys.
- Currently relating the AGN rest-frame properties in the NIR (where hot dust contributes significantly to the SED) to outflow properties inferred from both broad and narrow emission lines.
- Can generate AGN colour's as a function of redshift.

Paul Hewett & Manda Banerji

# Kaloian Lozanov (K26)

## End of inflation, oscillons and matter-antimatter asymmetry

Kaloian Lozanov & Mustafa Amin: arXiv:1408.1811





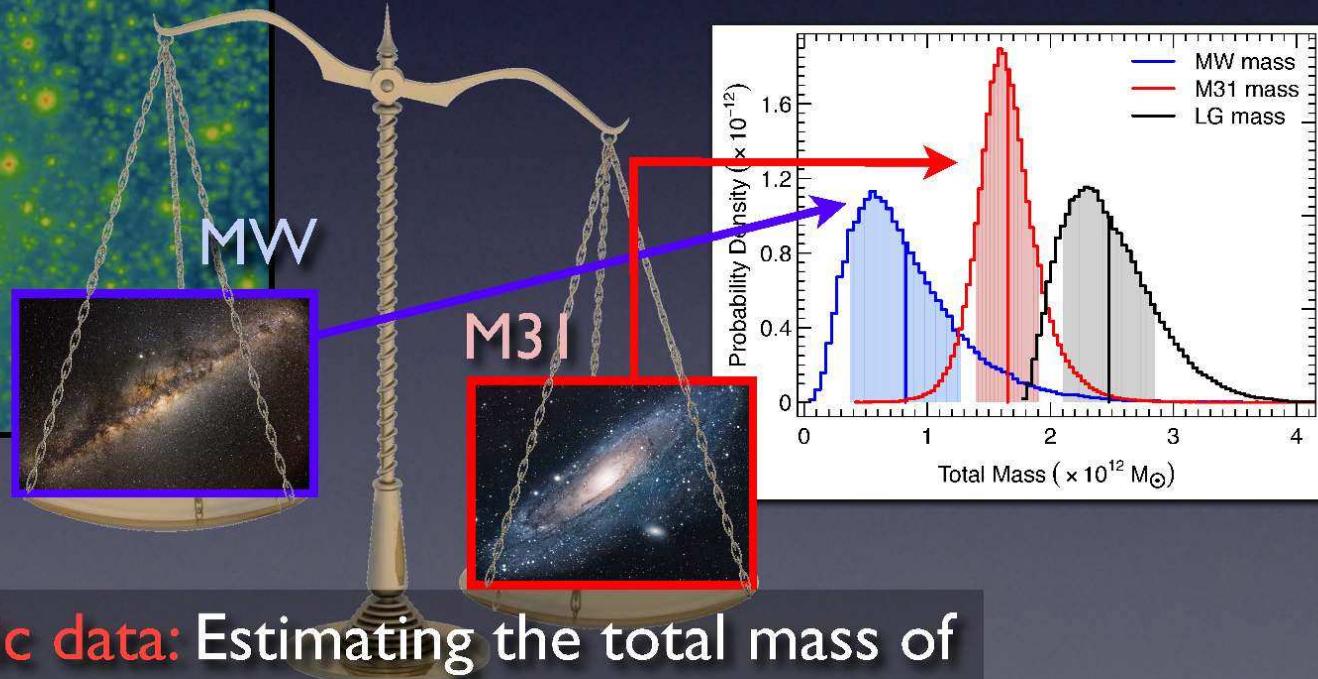
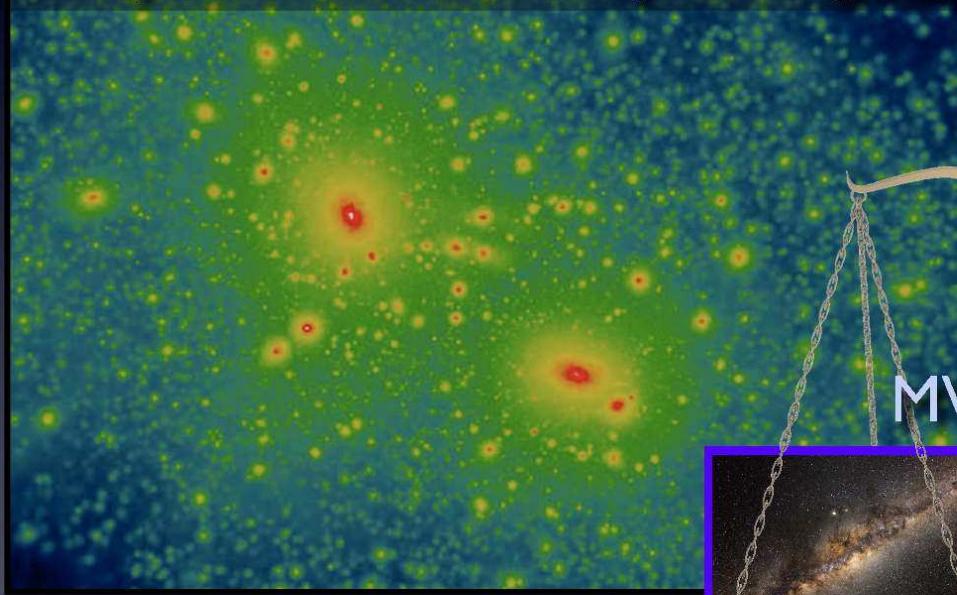
# Galaxies of the Local Group

JD Diaz



N-body Simulations of individual galaxies: orbits, tidal disruption, and streams

Cosmological CDM simulations: analysis of Local Group analogues



Kinematic data: Estimating the total mass of the Local Group, using e.g. MCMC methods

# Fernanda Ostrovska

[fo250@ast.cam.ac.uk](mailto:fo250@ast.cam.ac.uk)

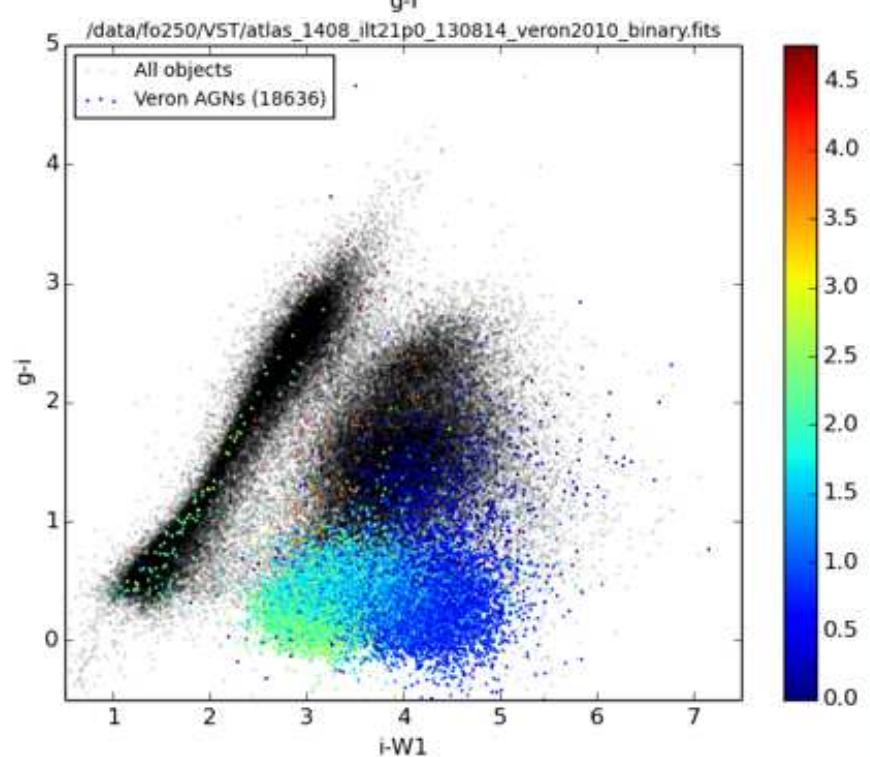
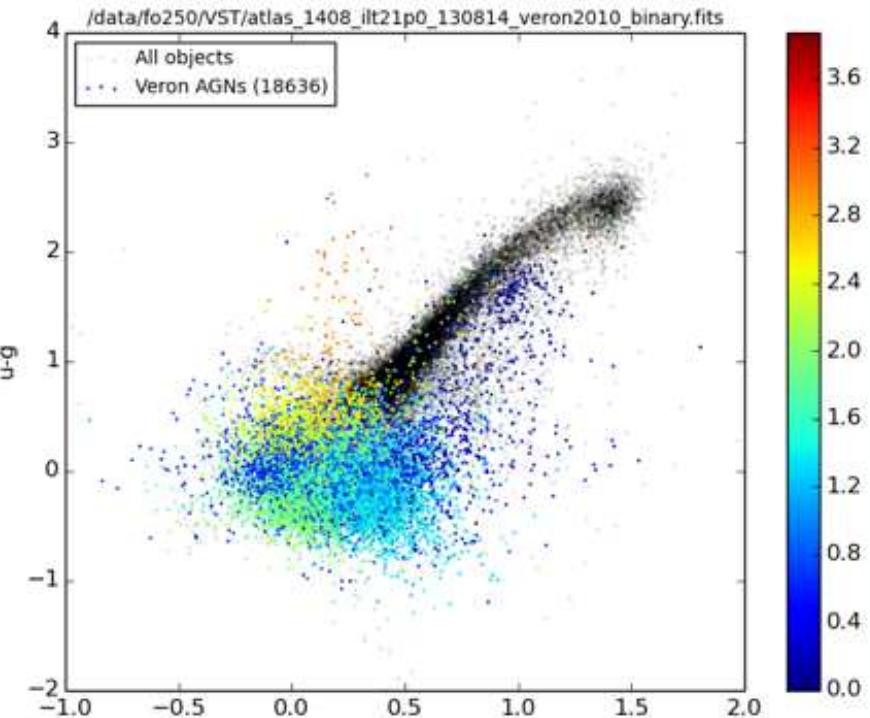
H29

Supervisor: Richard McMahon



Gravitationally lensed

in DES and VST



Cubs, Brownies,  
Scouts and Guides



“Skills”:  
Python  
LaTeX  
Fortran 77  
Finding stars



# Nadejda Blagorodnova

Supervisors: Nicholas A. Walton, Mike Irwin



## Transient Sky with Gaia

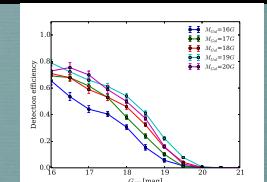
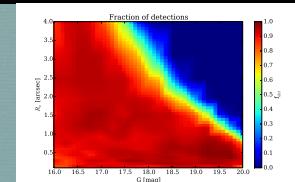
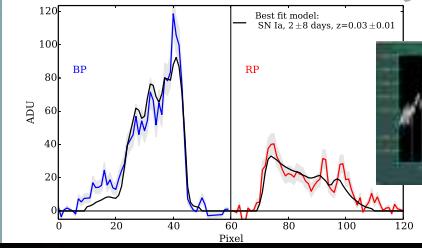
### Interests:

- Transient characterisation
- Statistics:
  - Rates
  - SN - host galaxy relation
- New types of objects

### Low-res spectra classification

### Transient detection efficiency

#### First Gaia SN!



### Gaia skills:

- Gaia data
- Simulators
- Alert stream

### Transients:

- Phot. and spec. for SN, TDE
- Survey rates

### General skills:

- Bayesian Statistics
- Slit spectroscopy
- Java, Python, IRAF

# Sophie Reed

I work with Richard McMahon on observational searches for high redshift quasars

- Using DES data, some VHS, VST data
- Making Python do odd things
- Currently learning to make SQL talk to PHP
- Outside of here: shooting, judo, horse riding and cycling, if you want to learn to shoot let me know.

# OUTFLOWS DRIVEN BY AGN

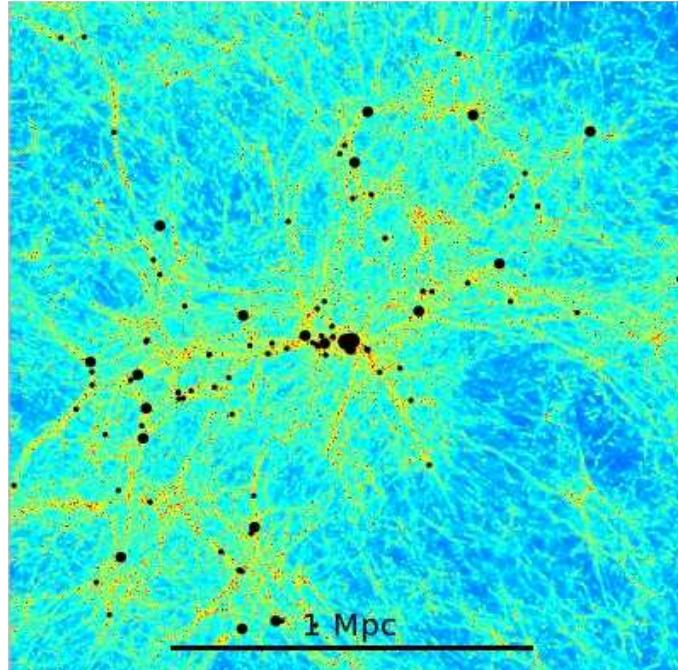
Me:

Tiago Andre Costa  
3<sup>rd</sup> Year



(I have aged a lot since I  
started my PhD. )

NUMERICAL  
SIMULATIONS

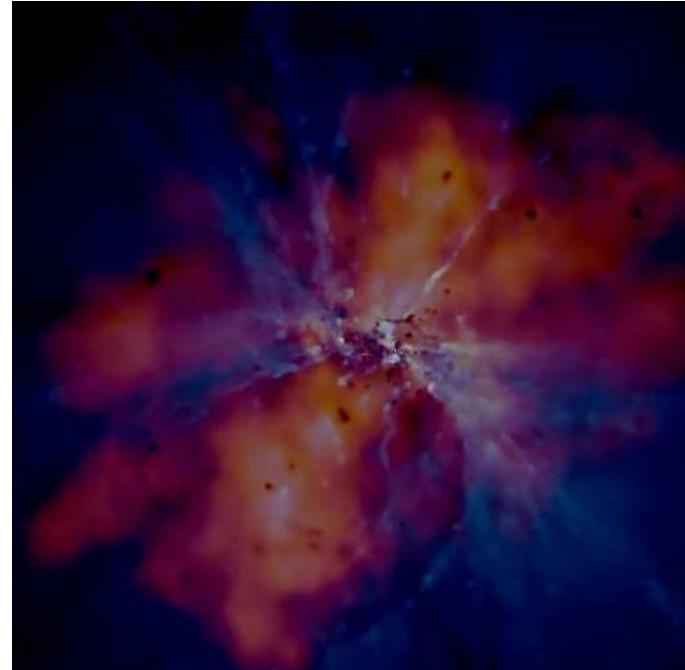


Supervisors:

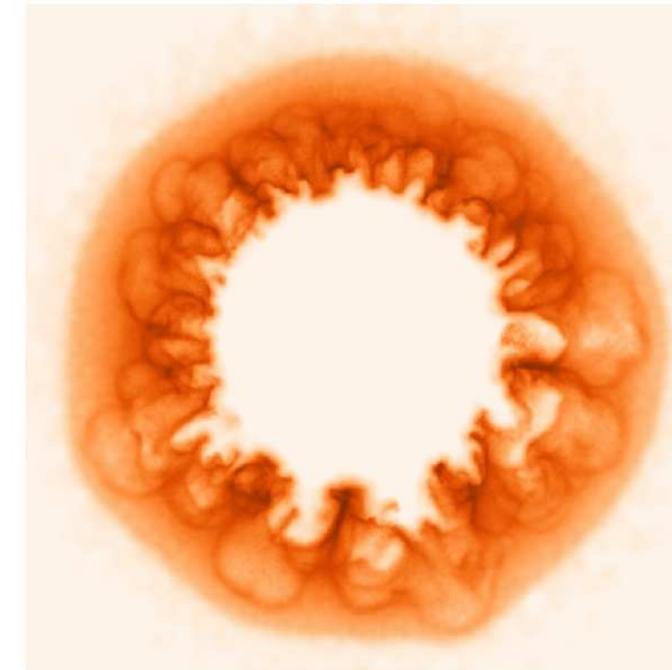
Martin Haehnelt  
&  
Debora Sijacki



COSMOLOGICAL  
ENVIRONMENT



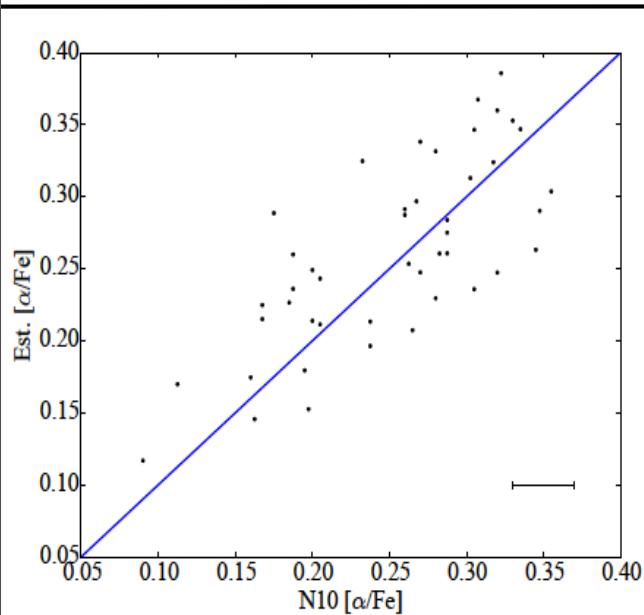
PHYSICS OF  
AGN OUTFLOWS



# Galactic Archeology (and the Nature of the Galactic Halo) with Large Surveys

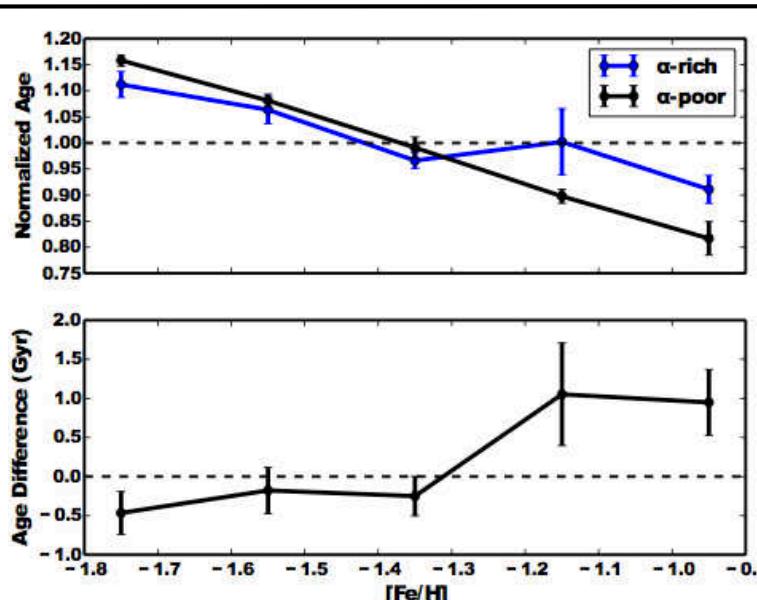
Keith Hawkins

Advisors: Prof. Gerry Gilmore; Dr. Paula Jofre. Collaborators: Dr. G. Kordopatis; Dr. T. Masseron  
**Research**

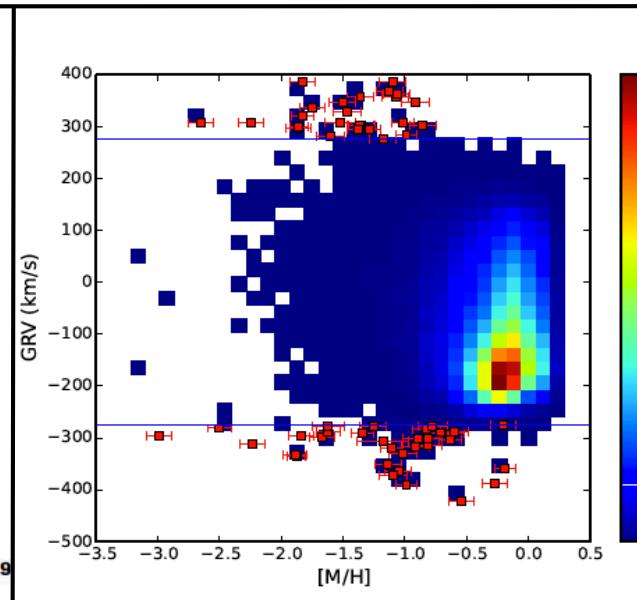


Developed a method to estimate  $\alpha$ -abundance (mean of Mg, Ti, Si, Ca) of low-res SDSS spectra

Hawkins et al. 2014, MNRAS, Accepted



Study Ages of  $\alpha$ -rich and  $\alpha$ -poor populations in Halo



Search for Hypervelocity and Runaway Stars

## Skills:

1. Python
2. Stellar Parameter (high-res + low -res)
3. Stellar Chemical Abundances (high-res + low-res)



# Patricia Larsen

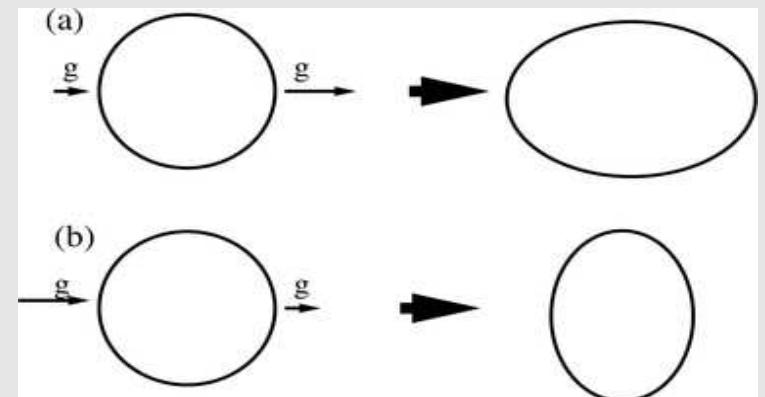
prl37@ast.cam.ac.uk

K26

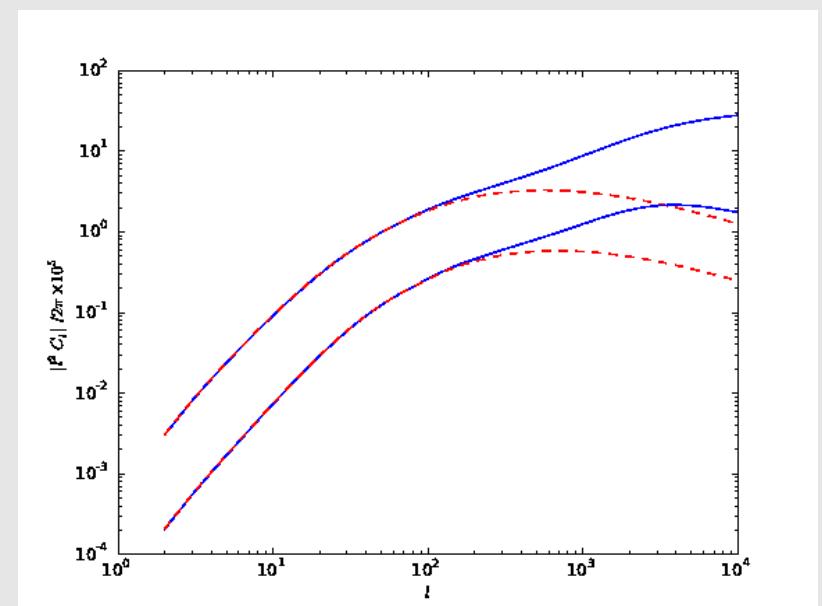
- **Supervisor:**  
Anthony Challinor

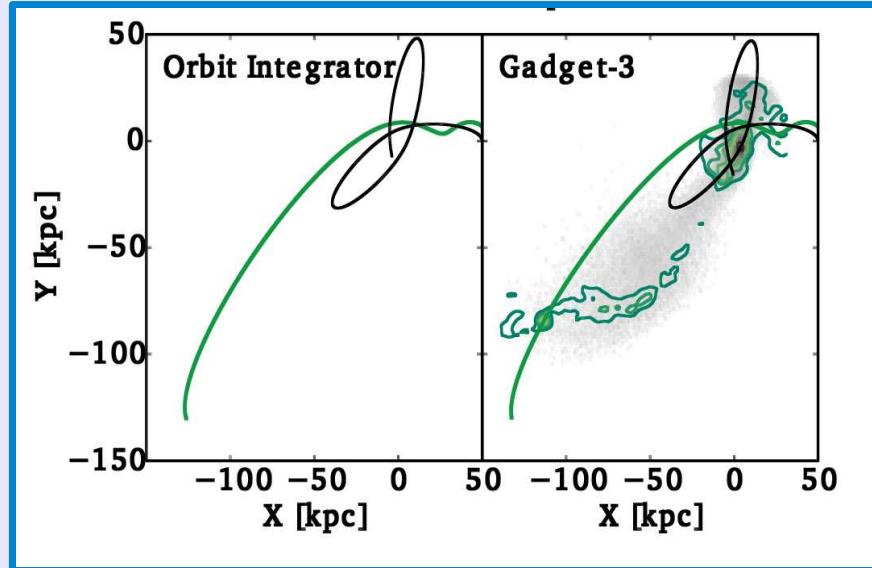
- **Current Research:**
  - Intrinsic Alignment of Galaxies
  - Weak Lensing
  - Cross-Correlation Studies

- **Other:**
  - Python
  - Outreach
  - Microlensing



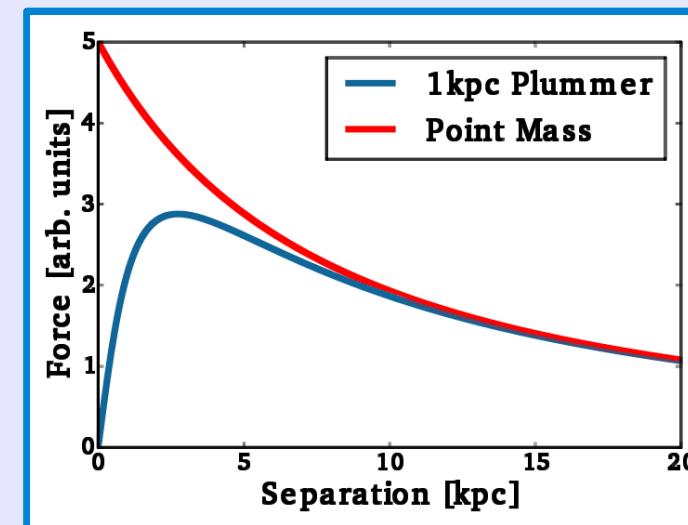
Catelan et al. 2001





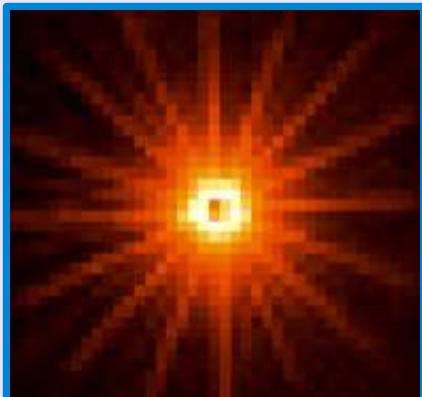
## Fast Orbits Calculations for Interacting Galaxies

- Galaxies = multi-component, analytic potentials (disks, halos, bulges...)
- [small-N] body
- C – fast!



## Mutual Forces between Spherical Bodies

- Spherical bodies with arbitrary potentials and sizes
  - Tools to approximate mutual force



## Pile Up on X-Ray CCDs (esp. XMM/EPIC)

- Estimate how bad & correct/model it for your spectra
- IDL code “*ready*” to use