

Paul Thomas Goodall

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Education & Research

- **Post Doctoral Research Assistant, University of Oxford, UK.** May 2010 -
- Working with: *Professor Katherine Blundell*.
- **DPhil Astrophysics, University of Oxford, UK.** Oct 2006 - Apr 2010
 - PhD Thesis: I recently completed my PhD in the Microquasar group at Oxford. My thesis explores the dynamics of the microquasar SS 433's jets from the location of jet-launch, out to hundreds of parsecs in the surrounding nebula of W50. My research incorporates the short-timescale variability observed in SS 433's jets with a more long-term representation of the jet evolution, resulting in a better understanding of jet behaviour, with relevance to other objects such as quasars. In order to achieve this I have analysed both new interferometric radio data from the GMRT and archival data from the VLA, along with optical spectroscopy of SS 433's interaction with its environs. These observations complement my computational work, featuring high resolution 3-D hydrodynamical simulations of the interaction of SS 433's jets with the W 50 SNR and the local Galaxy.
 - Supervisors: *Professor Katherine Blundell* & *Professor Dame Jocelyn Bell Burnell*.
- **MPhys Physics & Astrophysics, University of Leeds, UK.** Sept 2002 - June 2006
 - M.Phys Dissertation: I worked in the High Energy Astrophysics group at Leeds as part of the *AUGER* collaboration. My research involved analysing the data from the *AUGER* cosmic ray Čerenkov detector array in Argentina. I studied the arrival directions of the Ultrahigh-Energy-Cosmic-Rays (UHECRs, energies $> 10^{18}$ eV) in search of potential point-sources, and for evidence of a Greisen-Zatsepin-Kuzmin (GZK) cut-off in the energy spectrum from the accumulated particle detections.
 - Supervisors: *Dr Johannes Knapp* & *Dr Stella Bradbury*.

Observing Experience

- **Gemini South 8m Telescope - 2009** La Serena, Chile.
I wrote a proposal to obtain optical spectra of W 50 using GMOS in long-slit mode with Gemini South (GS). My project was awarded over 10 hrs of time and I spent 1 week observing at GS in June 2009. During this time I gained experience in operating a large world-class optical telescope.
- **Giant Metrewave Radio Telescope (GMRT) - 2008** Pune, India.
I used the GMRT to search for low-frequency radio counterparts to X-ray bright quasar lobes at $z = 2$.
- **110m Green Bank Telescope (GBT) - 2007** West Virginia, USA.
I used the GBT to search for Galactic Pulsars, and reduced these data.
- **Phillip Wetton Telescope (PWT) - 2006 - current** Oxford, U.K.
I use Oxford's 0.4m optical telescope in conjunction with the new CCD camera and custom-designed Spectrograph as a testbed for the Global Jet Watch project (www.GlobalJetWatch.net). I have also instructed undergraduates in the use of this telescope for their undergraduate practicals.

Teaching responsibilities and Outreach

- **Oxford Tutoring**
I currently teach Oxford physics undergraduates in Mechanics, Relativity and Circuit Theory.
- **Astrophysics Labs and Computing Labs**
I have demonstrated in the Astrophysics practicals lab for 2 years whilst at Oxford.
I am the assessor for one of the projects involving an eclipsing binary system.
I was a teaching assistant on the C-programming course for Physics undergraduates.
- **Graduate Representative**
I was the Astrophysics graduate representative during 2007-8, which involved attending faculty meetings and coordinating the graduate students in various ways. I initiated and organised an outreach "Open Day" for relatives and friends to hear research talks from our graduate students and tour the facilities available to our researchers. This mini-conference involved approximately 100 guests and 12 speakers.
- **Liverpool Celebration of Achievement 2008**
I was an invited speaker at the *Celebration of Achievement* event at the Liverpool Royal Philharmonic Hall in October 2008. This was an event to promote educational excellence and I presented awards in recognition of the achievements of exceptional young pupils. I spoke to an audience of approximately 1000 parents and schoolchildren about being an Astrophysicist and life as a scientist.

Research Skills

■ Languages

First Language : English (*Native*). Second Language : Español (*Working knowledge*)

■ General Computing Skills

I am familiar with Macintosh OS X, as well as most Linux and MS Windows distributions, and the relevant astronomical software. For graphical and presentation purposes I prefer to use:

Advanced Level: L^AT_EX ★ GLE ★ PGPLOT ★ MS PowerPoint ★ Keynote ★ GIMP

■ Programming Languages and Astrophysics Tools

Advanced Level: PERL ★ FORTRAN ★ C ★ PDL ★ IDL ★ Mathematica

Parallel Computing Experience : Familiar with MPI : currently using FLASH2.5 with AMR.

AIPS Experience : Continuum and Polarimetry reduction of VLA and GMRT data.

Website Development: HTML ★ JavaScript

Learning: PYTHON

Conferences, Presentations and Workshops

- Thesis Talk at the **Gemini South Observatory**, *La Serena, Chile*. June 2009
Talk Title: The interaction of the Microquasar SS 433 with the Milky Way.
- Thesis Talk at the **213th AAS Meeting**, *Long Beach, California*. January 2009
Talk Title: Hydrodynamic Simulations of the SS 433-W50 Complex.
- Poster presentation at the **7th Microquasar Conference**, *Foça, Turkey*. September 2008
Poster Title: Hydrodynamic Simulations of the SS 433-W50 Complex.
- **VLA 11th Synthesis Imaging Summer School** *New Mexico, U.S.A.* June 2008
- **IoP High Energy Astrophysics Meeting**, *University of Leeds, U.K.* December 2007
- **European Radio Interferometry School at Effelsberg Telescope** *Bonn, Germany*. September 2007
- **NAIC-NRAO Green Bank Telescope Single-Dish Summer School**, *West Virginia, U.S.A.* July 2007
- **AstroGrid & RadioNet Science Workshop**, *University of Oxford, U.K.* December 2006

Publications

- **A low-frequency but high resolution observation of W50 from GMRT.**
Goodall & Blundell, 2010 in preparation...
- **Kinematics of the W50-SS433 interaction revealed by Decade-resolution radio observations.**
Goodall, Bell Burnell & Blundell, 2010 (awaiting collaborator comments before submission)
- **GMOS Long-slit Spectroscopy of the SNR W50 using Gemini south: Relativistic Jet-ISM Interactions and SNR Progenitor Chemistry.**
Goodall & Blundell, 2010 in preparation.
- **When Jets and Supernovae Collide: Hydrodynamically Simulating the SS 433-W50 System.**
Goodall, P.T., Alouani Bibi, F., Blundell, K., 2010 (awaiting collaborator comments before submission)
- **Hydrodynamic Simulations of the SS 433-W50 Complex.**
Goodall, P.T., Alouani Bibi, F., Blundell, K.,
Proceedings of the "7th Microquasar Workshop" PoS(MQW7)093 (2008).
- **The Global Jet Watch spectrographs: a fibre-fed spectrograph for small telescopes**
Clarke, F. J., Gosling, A. J., Doolin, S., Goodall, P., Perez, S., Pattinson, P., Makin, R., & Blundell, K. M.
Proceedings of SPIE, Volume 7014, pp. 70145A-70145A-8 (2008).

Hobbies and Interests

- **Music** - I enjoy listening to and participating in most genres of music.
I love making music, and I play the Piano, Saxophone (any type), and flute, to grade V level or above.
I am the lead vocalist with a local soul band, and I perform at live gigs regularly with *The Pussycats*.
- **Sports** - I enjoy most team sports but especially: football and ultimate frisbee.
I also participate in Oxford University athletics, water polo and orienteering.

Referees

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