

Robert King

CONTACT INFORMATION

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RESEARCH INTERESTS

Ultracool dwarfs : the link between stars and planets, their various formation mechanisms and evolution.
Star formation, stellar evolution, and the initial mass function.

CURRENT RESEARCH

I am currently working on characterising the nearby binary brown dwarfs ϵ Indi Ba, Bb. VLT photometry and spectroscopy from the optical ($0.6\mu\text{m}$) through the thermal-IR ($5.1\mu\text{m}$) will allow us to put constraints on atmospheric models of sub-stellar objects at intermediate ages. This is linked to the dynamical mass monitoring of this system led by M. J. McCaughrean, which will determine the total system mass through observations of the relative motions of the two components of the system, and also the individual masses of the components through absolute astrometry with respect to field stars.

I am also using VLT optical observations of young, high-mass star forming regions along with *Chandra* observations to obtain classification spectroscopy of bona-fide cluster members to construct mass- and luminosity functions in these different star forming environments. This will be combined with multi-wavelength studies of these different regions. In the Carina nebula we have deep near-IR HAWK-I imaging with which we can characterise the entire stellar and population down to around $35M_{\text{Jup}}$.

EDUCATION

University of Exeter, Exeter, Devon, UK

Ph.D. Student: Expected completion, summer 2009

- Thesis Topic: *Observational studies of Brown Dwarfs and the Initial Mass Function*
- Advisor: Prof. Mark J. McCaughrean

University of St Andrews, St Andrews, Fife, UK

M.Phys Astrophysics (Hons) First Class

- Project Topic: *Young Active Stars and their Position in Colour Magnitude Diagrams*
- Advisor: Prof. Andrew Collier Cameron

Clyde Valley High School, Overtown, North Lanarkshire, UK

Dux of Clyde Valley High School 2000

PUBLICATIONS

A spectroscopic study of the nearest known brown dwarfs: ϵ Indi Ba, Bb (in prep.)
Robert R. King, Mark J. McCaughrean, Derek Homeier, France Allard, Ralf-Dieter Scholz and Nicolas Lodieu

Optical spectroscopic classification of X-ray selected young stellar cluster members: Trumpler 14 and NGC 2244 (in prep.)

Robert R. King, Mark J. McCaughrean, Leisa Townsley, Eric Feigelson, and Junfeng Wang

The UKIDSS-2MASS Proper Motion Survey I: Results from UKIDSS DR4 (submitted to MNRAS)

Niall R. Deacon, Nigel C Hambly, Robert R. King, and Mark J. McCaughrean

CONFERENCE
PROCEEDINGS

ϵ Indi Ba, Bb: a spectroscopic study of the nearest known brown dwarfs

Robert R. King, Mark J. McCaughrean, Derek Homeier, France Allard, Ralf-Dieter Scholz and Nicolas Lodieu, Proceedings of the 15th Workshop of Cool Stars, Stellar Systems, and the Sun (2008)

Dynamical masses of the nearest brown dwarf binary: ϵ Indi Ba, Bb

Catia V. Cardoso, Mark J. McCaughrean, Robert R. King, Laird Close, Ralf-Dieter Scholz, Rainer Lenzen, Wolfgang Brandner, Nicolas Lodieu, and Hans Zinnecker, Proceedings of the 15th Workshop of Cool Stars, Stellar Systems, and the Sun (2008)

TELESCOPE
PROPOSALS

I am P.I. on the successful ESO proposal entitled *Characterising the IMF of two high-mass star-forming regions with the VLT and Chandra* and the follow-up proposal *Characterising the IMF in a range of high-mass star-forming regions with the VLT and Chandra* which will allow us to investigate the IMF in different high-mass environments.

I am a co-investigator on a series of proposals to determine astrometrically, the dynamical system mass and individual masses of the nearest brown dwarf binary, ϵ Indi Ba, Bb (McCaughrean P.I.).

I am also a co-investigator on a HAWK-I science verification proposal *The Carina Nebula as a laboratory of massive star feedback* (Preibisch P.I.) and on an NSF proposal *The origins and environments of rich young stellar clusters* (Feigelson P.I.)

OBSERVING
EXPERIENCE

VLT

August 2008

Six half-nights visitor mode using VIMOS (Visible Multi-Object Spectrograph) on UT3 for proposal *Characterising the IMF of a range of high-mass star-forming regions with the VLT and Chandra*. Preceded by four service mode pre-imaging and imaging runs.

VLT

February 2008

Three nights visitor mode using VIMOS on UT3 for proposal *Characterising the IMF of two high-mass star-forming regions with the VLT and Chandra*. Preceded by two service mode pre-imaging runs.

Isaac Newton Telescope

June/July 2007

Twelve nights using the wide-field camera for IPHAS (INT Photometric H α Survey).

William Herschel Telescope

November 2006

Six nights using AF2/WYFFOS multi-object fibre-fed spectrograph.

TEACHING
EXPERIENCE

University of Exeter

First year astronomy laboratory

March 2006 - present

Includes demonstrating the laboratory practicals and marking student's work.

Second year astronomy laboratory

October 2005 - present

Includes demonstrating the laboratory practicals, marking student's work and end of project presen-

tations. I have also run observing sessions for the undergraduates to gather data for their projects.

University Telescope

October 2005 - present

I give an introductory talk to prospective undergraduates and their parents on our group's research and on the use of our 10" telescope.

Teaching at The Maynard School

January 2007

I have written and delivered lessons on astronomy and astrophysics to sixth formers at a local school as part of their extended studies program.

University of St Andrews

Second year astronomy laboratory

August 2004

Involved creating an astrophysics practical for second year undergraduates. This was based on the use of isochrones and evolutionary tracks in observations.

Summer research project

July/August, 2003

Involved numerical simulations of the distribution of comets ejected from forming planetary systems within our galaxy and the flux through our solar system.

- Project Topic: 'Interstellar comets'
- Supervisor: Prof. Ian A. Bonnell

COMPUTING SKILLS • Languages/Programs: IRAF (inc. CL scripting), Fortran, Perl, C-shell scripting.
• Operating Systems: Unix/Linux, OS X.

INTERESTS I am a keen cyclist and hill walker and in the past year I have taken up skydiving. I am also currently attempting to learn to unicycle.