

Curriculum vitae: Robert G. Izzard

Born 2nd November, 1976
British nationality
izzard@astro.uni-bonn.de
(personal) rob.izzard@gmail.com

W2 Professor of Astrophysics,
Argelander-Institut für Astronomie,
University of Bonn, Germany.
<http://www.astro.uni-bonn.de/~izzard/>
Skype *radiognomeinvisible*

Specialist areas of astrophysics

- The evolution of single and binary stars.
- Statistical studies of stellar populations and stellar nucleosynthesis.
- Chemically peculiar stars, chemical evolution of globular clusters and the Galaxy.
- Computational astrophysics.
- Main co-ordinator of stellar population codes: *binary_c/nucsyn* and *BONNFIREs*.

Research and Education

- 07/2010–** W2 Professor, Argelander-Institut für Astronomie, University of Bonn.
- 07/2008–06/2010** Marie Curie Intra-European Fellowship at Université Libre de Bruxelles, Belgium:
BINSTAR, a stellar evolution code to simulate low- and intermediate-mass binary stars.
- 05/2005–06/2008** NWO (Netherlands Organisation for Scientific Research) Postdoctoral Fellowship at Utrecht University: *Population synthesis of carbon-enhanced metal-poor stars.*
- 10/2000–07/2004** PhD *Nucleosynthesis in Binary Stars* supervised by Dr. Christopher Tout, Institute of Astronomy, Cambridge University, UK.
- 10/1995–07/1999** BA Hons., Master of Natural Sciences in Experimental and Theoretical Physics. Cambridge University, UK.

Teaching Experience

- 2013–** Co-ordinator of *Astrosem*, Masters student talks on hot topics in astrophysics.
- 2013** (December) International Max-Planck Research School *Blackboard Lectures in Stellar Evolution*
- 2012–** Chair of Seminar on Technical and Computational Aspects of Astronomy at the *Alfa*, Uni. Bonn.
- 2012–3** Guest lecturer in Scientific Writing at Uppsala University.
- 2011–** Developed *Classes in Scientific Writing* (Uni. Bonn Masters in Astrophysics) specifically to address students' need for tuition in this area.
- 2011–** Developed *Stars and Stellar Evolution* lab course (Uni. Bonn Masters in Astrophysics).
- 2010–** New lecture course Binary Stars (Uni. Bonn Masters in Astrophysics).
- 2007–10** Lectures on *Introductory Perl Programming for Astrophysicists* (at Utrecht and ULB).
- 2006–8** Development of interactive exercises with *Window To The Stars*.
- 2004–5** Supervision of 1st-3rd year mathematics courses, Cambridge University.
- 2002–3** Supervision of 3rd year electromagnetism course, Cambridge University.
- 2001–3** Supervision of computer aided teaching in mathematics for 1st to 3rd year undergraduates, Mathematics Dept., Cambridge University.

Academic Supervision

- 2013** Lars Krause Bachelor project *Stability of Mass Transfer Algorithms in Binary Star Simulations*.
- 05-07/2013** DAAD summer student Surajit Mondal: *The Neutron Star-Black Hole merger rate*.

- 2012–** Sutirtha Sengupta, PhD thesis: *The Origin of Carbon-Enhanced Metal Poor Stars*.
- 05–07/2012** DAAD summer student Tushar Shrotriya: *Supernova Ib/c Progenitors in Binary Systems*.
- 2011–** Fabian Schneider, PhD thesis: *A statistical comparison of individual stars and stellar samples with stellar evolution models*.
- 2011–** Dominique Meyer, PhD thesis: *Hydrodynamical modelling of the circumstellar medium of massive runaway stars*.
- 2011–12** Denise Keller, Masters thesis: *Population Synthesis of Planetary Nebulae*.
- 2011–12** Sutirtha Sengupta, Masters thesis: *J-type Carbon Stars*.
- 2010–** Dr. Herbert Lau, postdoc: population synthesis with stellar rotation project BONNFIREs.
- 2010–11** Fabian Schneider, Masters thesis: *The Effects of Stellar and Close Binary Evolution on the Present Day Mass Function*.

Awards and Grants

- 2011–12** DAAD-Go8 Exchange grant (with A. Karakas, Mt. Stromlo Obs., *Lithium in the Milky Way*).
- 2010** Five year-equivalent postdoc funding granted with W2 position at AIfA, Bonn.
- 2009** CNRS grant to (Super-AGB conference, Strasbourg).
- 2008–10** Marie Curie Intra-European Fellowship, Université Libre de Bruxelles.
- 2007** European Science Foundation/ASTROSIM short visit grant (Split Modest workshop).
- 2007** Monash University grant (collaborative visit).
- 2006–7** Department of Education, Science and Training - International Science Linkages grant to work on 3D stellar models with Djehuty in 2007–8.
- 06/2005–06/2008** NWO Fellowship, Utrecht University.
- 06/2005–06/2008** Numerous Leids Kerkhoven-Bosscha Fonds travel awards.
- 09/2004–10/2004** Visiting Fellowship, Saint Mary's University, Halifax, Canada.
- 2000–2003** Particle Physics and Astronomy Research Council Studentship, Cambridge University.
- 1997–2001** St John's College Scholarship, Cambridge University.

Research Mobility 2008-13

- 2013** DAAD/Go8 exchange visit to Australia (Mt. Stromlo Observatory and ANU via Monash), IoA Cambridge.
- 2012** Armagh Observatory, DAAD/Go8 exchange visit to Australia (Mt. Stromlo Observatory, ANU, Monash), Oxford University, IoA Cambridge, Uppsala University, European Space Agency Leiden.
- 2011** Visits IoA Cambridge, University of Manchester, Oxford University, Utrecht University, University of Central Lancashire, ENS Paris, Dark Cosmology Centre Copenhagen.
- 2010** Visits to Lund Observatory, ENS Paris, Monash University, Mt. Stromlo Observatory, University of Canterbury, Christchurch NZ, and the Argelander-Institut für Astronomy, Bonn.
- 2009** Two-week collaborative visit IoA Cambridge (Dr. C.A. Tout), University of Central Lancashire, AIfA Bonn, Lund Observatory.
- 2008** Collaboration at Lawrence Livermore National Laboratory, visitor: Princeton, Santa Cruz.

Conference organisation

- 07/2014** Chair of SOC, 11th *Torino Workshop*, Bad Honnef, Germany.
- 09/2013** SOC member *Setting a new standard in the analysis of binary stars*, Leuven, Belgium.
- 03/2012** Organiser of UK *National Astronomy Meeting* session *Binary Stars*.
- 06/2010** Organiser of *Brussels workshop on massive stars*.
- 09/2009** Scientific Organising Committee for *Stellar Mergers*, Leiden, The Netherlands.

- 04/2009** Co-chair *EAS-RAS Joint-European National Astronomy Meeting* session *Binary Stars*.
04/2005 Co-Chair SOC *Nucleosynthesis in Binary Stars*, Leiden, Netherlands.

Professional responsibilities

- 2012** Uni. Bonn representative at Alexander von Humboldt meeting, Berlin.
2011– Chair of AifA professor meetings.
2010–11 Communications consultant, German Excellence-cluster bid.
2010– Chair of AifA IT Steering Committee; Member of the AifA board; various interview panels.
2005– Referee for the journals *Monthly Notices of the Royal Astronomical Society*, *Astronomy and Astrophysics*, and *The Astrophysical Journal*.

Observing Experience

Five nights at the *William Herschel Telescope* observing double white dwarf binaries to obtain radial velocities, with on-the-fly IRAF data reduction (2003).

Outside Academia

- 07/1999–07/2000** The Met Office, Bracknell, UK. Software development for weather forecasting.

Computing and language skills

Highly experienced in C, Fortran, Perl, SGML/HTML, UNIX/Linux, OpenMP.
Experience with C++, Java, Javascript, MySQL, Python, Windows, MacOS.
Basic knowledge of French, German, Dutch.

Refereed Publications 2008–13

- *The rotation rates of massive stars: the role of binary interaction through tides, mass transfer and mergers* S.E. de Mink, N. Langer, R.G. Izzard, H. Sana, A. de Koter. *ApJ* 764, 166 (2013).
- *BINSTAR: a new binary stellar evolution code. Tidal interactions* L. Siess, R.G. Izzard, P.J. Davis, R. Deschamps. *A&A* 550, 100 (2013).
- *Wind Roche-lobe Overflow: Application to Carbon-Enhanced Metal-poor Stars* C. Abate, O.R. Pols, R.G. Izzard, S.S. Mohamed, S.E. de Mink *A&A in press* arXiv1302.4441 (2013).
- *Eccentricity-pumping in post-AGB stars with circumbinary discs* T. Dermine, R.G. Izzard, A. Jorissen, H. Van Winckel. *A&A* 551, 50 (2013).
- *Binary Interaction Dominates the Evolution of Massive Stars* H. Sana, S.E. de Mink, A. de Koter, N. Langer; C.J. Evans, M. Gieles, E. Gosset, R.G. Izzard, J.-B. Le Bouquin, F.R.N. Schneider. *Science* 337, 444 (2012).
- *The occurrence of nitrogen-enhanced metal-poor stars: implications for the initial mass function in the early Galactic halo* O.R. Pols, R.G. Izzard, R.J. Stancliffe, E. Glebbeek. *A&A* 547, 76 (2012).
- *On the nature and detectability of Type Ib/c supernova progenitors* S.-C. Yoon, G. Gräfner, J.S. Vink, A. Kozrejeva, R.G. Izzard. *A&A* 544, 11 (2012).
- *Classical Cepheids Require Enhanced Mass Loss* H.R. Neilsen, N. Langer, S.C. Engle, E. Guinan, R.G. Izzard. *ApJ* 760, 18 (2012).
- *The VLT-FLAMES Tarantula Survey I: Introduction and observational overview* C.J. Evans et al. *A&A* 530, 108 (2011).
- *White-dwarf kicks and implications for barium stars* R.G. Izzard, T. Dermine, R.P. Church *A&A* 523,10 (2010).
- *Population Synthesis of Carbon-enhanced Metal Poor Stars* R.G. Izzard, E. Glebbeek, R.J. Stancliffe, O.R. Pols *A&A* 508, 1359 (2009).
- *Massive binaries as the source of abundance anomalies in globular clusters* S.E. de Mink, O.R. Pols, N. Langer, R.G. Izzard *A&A* 507, L1-4 (2009).
- *The impact of binary-star yields on the spectra of galaxies* A.E. Sansom, R.G. Izzard and P. Ocvirk *MNRAS* 399, 1012 (2009).
- *A multiphysics and multiscale software environment for modeling astrophysical systems.* Portegies Zwart et al. *New Astronomy* 14, 369 (2009).
- *Binary Populations of Carbon-Enhanced Metal-Poor Stars* R.G. Izzard, E. Glebbeek, R.J. Stancliffe, O.R. Pols. *PASA* 26, 311 (2009).
- *The Puzzling Frequencies of CEMP and NEMP Stars* O.R. Pols, R.G. Izzard, E. Glebbeek, R.J. Stancliffe. *PASA* 26, 327 (2009).
- *Fluorine in carbon-enhanced metal-poor stars: a binary scenario* M. Lugaro, S.E. de Mink, R.G. Izzard et al. *A&A* 484, 27L (2008).
- *Gamma-ray bursts from tidally spun-up Wolf-Rayet stars?* R.G. Detmers, N. Langer, Ph. Podsiadlowski, R.G. Izzard *A&A* 484,831 (2008).
- *The effect of massive binaries on stellar populations and supernova progenitors* J.J. Eldridge, R.G. Izzard, C.A. Tout. *MNRAS* 384, 1109 (2008).

Please note that the reduced publication record in 2009–10 followed serious illness.

Other Publications 2008–13

- *Massive Binary Stars and Self-Enrichment of Globular Clusters* R.G. Izzard, S.E. de Mink, O.R. Pols, N. Langer, H. Sana and A. de Koter. Proceedings of *Reading the book of globular clusters with the lens of stellar evolution*, in press (2013).
- *Stellar Evolution Models of Classical Cepheids Require Enhanced Mass Loss* H. Neilson, N. Langer, S.G. Engle, E.F. Guinan, R.G. Izzard. AAS Meeting 221 (2013).
- *Challenges for Understanding the Evolution of Massive Stars: Rotation, Binarity, and Mergers* de Mink, S. E.; Brott, I.; Cantiello, M.; Izzard, R. G.; Langer, N.; Sana, H. ASPC 465, 65 (2013).
- *Type Ia Supernovae and the Uncertainties in their Progenitor Evolution* Claeys, J. S. W.; Pols, O. R.; Izzard, R. G.. IAUS 281, 236 (2013). *Binary Star Evolution: Mass Loss, Accretion and Mergers*, Mykonos, Greece June 22-25 2010.
- *Common Envelope Evolution* R.G. Izzard, P.D. Hall, T.M. Tauris, C.A. Tout. Invited review at IAU Symposium 283 *Planetary Nebulae an Eye to the Future* (2012).
- *Multiplicity of massive O stars and evolutionary implications* Sana, H. et al. Conference proceedings to appear in “370 years of astronomy in Utrecht” (2012).
- *How did Carbon-Enhanced Metal-Poor Stars form?* C. Abate, O.R. Pols, R.G. Izzard, S. Mohammed, S.E. de Mink. Proceedings of *Evolution of Compact Binaries* (2011).
- *The search for progenitor models of type Ia supernovae* J.S.W. Claeys, O.R. Pols, J. Vink, R.G. Izzard (2011).
- *Formation and Evolution of Carbon-Enhanced Metal-Poor Stars* C. Abate, O.R. Pols, R.G. Izzard. ASPC 2011, 445 (2011).
- *Binaries are the best single stars* S.E. de Mink, N. Langer, R.G. Izzard. Proceedings of the 39th Liège International Astrophysical Colloquium (2011).
- *The O stars in the VLT-FLAMES Tarantula Survey* A. de Koter et al. GREAT-ESF Workshop: *Stellar Atmospheres in the Gaia Era* (2011).
- *The VLT FLAMES Tarantula Survey* C. Evans et al. *The ESO Messenger* 145,33.
- *BINSTAR: A new Binary Stellar-Evolution Code* L. Siess, R.G. Izzard, P. Davis, R. Deschamps. Proceedings of *Evolution of compact binaries*, Chile. (2011).
- *The Barium Star Mystery* T. Dermine, R.G. Izzard, A. Jorissen and R. Church. *Why Galaxies Care about AGB Stars II* (2011).
- *The Rise and Fall of the Barium Stars* R.G. Izzard, T. Dermine and R. Church. *Asymmetric Planetary Nebulae V* (2011).
- *Fast rotating stars resulting from binary evolution will often appear to be single* S.E. de Mink, N. Langer, R.G. Izzard IAUS 272 (2010).
- *Massive binaries and the enrichment of the interstellar medium in globular clusters* S.E. de Mink, O.R. Pols, N. Langer, R.G. Izzard IAUS 266 (2010).
- *Carbon-enhanced metal-poor stars as probes of early Galactic nucleosynthesis* O.R. Pols, R.G. Izzard, E. Glebbeek, R.J. Stancliffe IAUS 265 (2010).
- *Light elements in massive single and binary stars* N. Langer, I. Brott, M. Cantiello, S.E. de Mink, R.G. Izzard, S.-C. Yoon IAUS 268 (2010).
- *GALEV Evolutionary Synthesis Models: Why Are They Special?* P. Anders, R. Kotulla, R.G. Izzard, I. Brott AAS 215 (2010).

- *The Search for Progenitor Models of Type Ia Supernovae* J.S.W. Claeys, O.R. Pols, J. Vink, R.G. Izzard. Ron Webbink's 65th birthday conference (2010).
- *Barium Stars Revisited* T. Dermine, R.G. Izzard, A. Jorissen and R. Church. Ron Webbink's 65th birthday conference (2010).
- *Massive Stars as Progenitors of SNe & GRBs* N. Langer et al. XXVIth IAP Annual Colloquium (2010).
- *White Dwarf Kicks and Implications for Barium Stars* R.G. Izzard, R.P. Church and T. Dermine. Proceedings of the 10th Torino Workshop (2010).
- *Modelling the evolution and nucleosynthesis of carbon-enhanced metal-poor stars* O. R. Pols, R.G. Izzard, M. Lugaro, S.E. de Mink. IAUS 252, 383 (2008).
- *The Mysterious R Stars* R.G. Izzard, C.S. Jeffery and J. Lattanzio. AIPC 1001, 33 (2008).
- *The Effect of Massive Binaries on Stellar Populations and Supernova Progenitors* J.J. Eldridge, R.G. Izzard, C.A. Tout. IAUS 250, 179 (2008).
- *A Multiphysics and Multiscale Software Environment for Modeling Astrophysical Systems* S. Portegies Zwart et al. LNCS 5102, 207 (2008).

Talks 2008–13

- *The Physics of the Sun*, invited review at *Japanese-German Frontiers of Science Symposium*, October 2013.
- *The J-type carbon stars: a solution in sight?* Monash University seminar, 2013.
- *The origin of the elements* Uni. Bonn "Astroclub" for undergraduates 2013.
- *The stellar mass function: Binary stellar evolution and the most massive stars* colloquium at Mt. Stromlo Observatory and Uppsala University 2012.
- *Lithium in the Cosmos: Review* Astrophysics Seminar, AIfA Bonn, 2012.
- *Massive Binary Stars and self-enrichment of globular clusters* At *Reading the book of globular clusters with the lens of stellar evolution*, Rome, 2012.
- *An introduction to and tools for stellar population synthesis* review talk, AIfA Bonn, 2012.
- *The Henyey Scheme* Technical Astrophysics Seminar, AIfA Bonn, 2012.
- *The J-type Carbon Stars* Armagh Observatory 2012.
- *Scientific Writing for Astronomers and Astrophysicists* Invited talk at Armagh Observatory 2012.
- *Common Envelopes* Invited review at IAU symposium 283 *Planetary Nebulae - An Eye to the Future* 2011.
- *The Origin of the Elements* University of Bonn *Dies Academicus* invited review talk, 2011.
- *J-type Carbon Stars* AIfA review talk 2011.
- *The Mysterious Barium Stars* UK *National Astronomy Meeting* 2011.
- *Mass Transfer In Binary Stars* Colloquium at Lund Observatory, 2010.
- *Beer, Bureaucracy and Binary Stars* GPU workshop at Lund Observatory, 2010.
- *Barium Stars Revisited* 10th Torino Workshop, Christchurch, NZ 2010; *Asymmetric Planetary Nebulae V*, Windermere UK 2010.
- *The Binary/CEMP connection* Colloquium Mt. Stromlo observatory 2010.
- *Binary Population Synthesis: Now and Next* VLT-FLAMES collaboration workshop, Madrid, 2010.
- *Binary Stars* review/interview talk, AIfA Bonn 2009.

- *The ULB Binary Modelling Effort*. Brussels Planetarium, 2009.
- *SAGB stars* The Giant Branches workshop - Leiden 2009.
- *Solving the Century-Old R-Star Mystery* 2006-8 (Brussels, Leuven, Monash, Swinburne, ANU Canberra, Amsterdam, *Unsolved Problems In Stellar Astrophysics* at IoA Cambridge, UCLaN).
- *The puzzling frequencies of CEMP and NEMP stars* At *The elements heavier than iron* Torino 2008.

Posters 2008–13

- *A holistic approach to Galactic evolution: The CEMP problem* S. Sengupta, R.G. Izzard, H.B. Lau; *IMPRS* evaluation (2012).
- *BINSTAR: A new Binary Stellar-Evolution Code* L. Siess, R.G. Izzard, P. Davis, R. Deschamps (2011).
- *Type Ia Supernovae and the uncertainties in their progenitor evolution* J.S.W. Claeys, O.R. Pols, F. Verbunt, R.G. Izzard, at *Supernovae and their Host Galaxies*, 20–24/06/2011 Sydney, Australia.
- *The Barium Stars Mystery* T. Dermine, R.G. Izzard, R.P. Church and A. Jorissen. Presented at the *Binary Star Evolution: Mass Loss, Accretion and Mergers* in Mikonos, June 2010.
- *Asymmetric Planetary Nebulae V*, Windermere, England, June 2010 and *Why Galaxies Care About AGB Stars II*, Vienna, July 2010.

Referees

The following have kindly offered to write reference letters when required:

- Prof. Dr. Norbert Langer
Argelander Institut-für Astronomie, University of Bonn, Auf dem Hügel 71, 53121 Bonn, Germany.
- Dr. Onno Pols
Department of Astrophysics, Radboud Universiteit, P.O. Box 9010, NL-6500 GL Nijmegen, The Netherlands.
- Dr. Christopher Tout
Institute of Astronomy, University of Cambridge, Madingley Road, Cambridge, CB3 0HA. United Kingdom.