

## Dr. Duncan Hugh Forgan, MPhys. (Hons) Ph.D

I am a computational astrophysicist, currently a postdoctoral fellow at the Royal Observatory Edinburgh. My research centres on hydrodynamic simulations of circumstellar discs. Formed around young stars, these objects provide the feedstock for the planets. I focus on the early self-gravitating phase, where instabilities in the disc are important for the evolution of both the star and the planet. I also carry out astrobiological research, attempting to improve theoretical estimates to assist the Search for Extraterrestrial Intelligence (SETI).

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### SKILLS

Substantial experience writing FORTRAN, IDL, MATLAB, and Java  
Substantial experience with computer simulation and modelling processes  
Significant experience in delivering lectures, seminars and colloquia to a variety of audiences  
Substantial experience in communicating science to the public via radio, TV and new media  
Basic German and Italian.

### EMPLOYMENT HISTORY

2010 - present: Postdoctoral Research Fellow, University of Edinburgh  
2007-2010: Postgraduate Student/Tutor, University of Edinburgh  
2007: Personal Tutor, Secondary School Mathematics and Physics

### ACADEMIC SIGNATURES OF MERIT

12 Academic Articles with 41 citations (*h-index=4, links to PDFs available at website above*)  
3 popular press articles  
Referee on several occasions for the International Journal of Astrobiology and MNRAS  
Lecturer in both Open Learning and Degree Courses  
Roberts Researcher-Led Initiatives Fund Awardee (IfA Public Speaking Club)

### AWARDS

2011: Cormack Bequest Vacation Scholarship - Supervising Semeli Papadogiannakis  
2010: Open Learning Course - Introduction to Freelance Journalism (Grade 'A')  
2007: STFC PhD Studentship (QUOTA)  
2006: Cormack Bequest Vacation Scholarship  
2004: Ramsay Memorial Prize for Astronomy  
2003: Simon Gray Award for Mathematics, Simon Gray Award for Logic

### TEACHING EXPERIENCE

2011: Lecturer - Universe (Lifelong Learning Open Course), Astrobiology (SUPA Course, April)  
2010: Tutor - Discovering Astronomy S (Year 1), Astrophysics 3 (Year 3), General Relativity (Year 4/5)  
Lecturer - Universe (Lifelong Learning Open Course)  
2009: Tutor - Astronomy 1G (Year 1), Discovering Astronomy S (Year 1)  
Lecturer - Science and Society (Year 1)  
2008: Tutor - Discovering Astronomy G (Year 1), Astronomy 1S (Year 1)

### EDUCATION

2007 - 2010: **PhD**, Institute for Astronomy, University of Edinburgh (Supervisor: Dr Ken Rice)  
"Probing Self-Gravitating Protostellar Discs using Smoothed Particle Hydrodynamics with Radiative Transfer"  
2002-2007: **Master of Physics with Honours in Astrophysics (First Class)**  
Institute of Astronomy, University of Edinburgh (Transcripts available on request)

## MEDIA EXPERIENCE

My research was part of a press release in February 2009. This was picked up by the BBC, ITV, CNN and many newspapers, as well as being significantly reported across the blogosphere (Google "*Duncan Forgan alien*" for some examples). I gained a great deal of experience in the interview process, conducting over 30 for TV, radio and internet magazines (links to some of the media can be found on my website). I have also recorded some videos of my own, in particular for the *Vidiowiki* project (again, see my website) and for the *Too Hot to Handle?* project on the Scottish Schools' GLOW network.

## PRESENTATIONS/PUBLIC OUTREACH

During my academic career, I have presented my research on many occasions at venues throughout the UK and Europe. I have been invited to present as a keynote speaker, both at specialist and multidisciplinary conferences. These presentations have ranged from 20 minute talks to hour-long seminars and colloquia. I have also given lectures for both Open Access and degree courses at the University of Edinburgh.

Outside the academic world, I regularly participate in public outreach events, including *Cafe Scientifique* discussions and debates, as well as visits to primary schools, secondary schools and youth organisations. A full list of these events can be found at my website.

## HOBBIES/INTERESTS

I enjoy golf, which I have been playing for around ten years. I also play basketball, having played for my secondary school team, although more recently I tend to play non-competitively. I have recently begun playing squash, although with limited results. I am a keen gardener, and enjoy the peace and quiet offered by a day's labour on my own land.

More recently, I have expanded my interests to include amateur drama, assisting with rehearsals and production. I am a voracious reader, and I enjoy trying my hand at creative writing when I have the time. I have been attempting to learn the guitar, however my lack of musical skills is making it an uphill struggle!

At the end of a hard day, I savour the opportunity for good whisky, and am enjoying sharpening my palate by attending tastings.

## REFERENCES

Dr. Ken Rice (PhD Supervisor)  
Room C15  
Institute for Astronomy, ROE  
Blackford Hill  
Edinburgh EH9 3HJ

Prof. Anthony Whitworth (Collaborator)  
N/3.26  
Cardiff School of Physics and Astronomy  
Cardiff University  
Queens Buildings  
The Parade  
Cardiff CF24 3AA

## PUBLICATIONS LIST

### JOURNAL ARTICLES

**Forgan, D.H.**, Rice W.K.M., 'The Jeans Mass as a Measure of Self-Gravitating Disc Fragmentation and Initial Fragment Masses', MNRAS (2011), submitted

**Forgan, D.H.**, Spatio-temporal Constraints on the Zoo Hypothesis, and the Breakdown of Total Hegemony', IJA, (2011), in press

**Forgan, D.H.**, Elvis, M. 'Extrasolar Asteroid Mining as Forensic Evidence for Extraterrestrial Intelligence', IJA, (2011), in press

**Forgan, D.H.**, Nichol, R.C. A Failure of Serendipity - the Square Kilometre Array will struggle to Eavesdrop on human-like Extraterrestrial Intelligence, IJA, (2011), 10, pp 77-81

**Forgan, D.H.**, Rice W.K.M., Cossins, P., Lodato, G., 'The Nature of Angular Momentum Transport in Radiative Self-Gravitating Protostellar Discs', MNRAS, (2011), 410, pp 994-1006

**Forgan, D.H.**, Rice W.K.M., 'Native Synthetic Imaging of Smoothed Particle Hydrodynamics density fields using gridless Monte Carlo Radiative Transfer', MNRAS, (2010), 406, pp 2549-2558

Bozhilov, V., **Forgan D.H.**, 'The Entropy Principle, and the Influence of Sociological Pressure on SETI', IJA, (2010), 9, pp 175-181

**Forgan, D.H.**, 'Numerical Astrophysics, Numerical Astrobiology and the Search for Extraterrestrial Life', Journal of Cosmology, (2010), 5, pp 811-817

**Forgan D.H.**, Rice W.K.M., 'Numerical Testing of the Rare Earth Hypothesis using Monte Carlo Realisation Techniques', IJA, (2010), 9, pp 73-80

**Forgan D.H.**, Rice W.K.M., 'Stellar Encounters in the Context of Outburst Phenomena', MNRAS, (2010), 402, pp 1349 - 1356

**Forgan D.H.**, Rice W.K.M., 'Stellar Encounters: A Stimulus for Disc Fragmentation?', MNRAS, (2009), 400, pp 2022-2031

**Forgan D.H.**, Rice W.K.M., Stamatellos D., Whitworth A.P., 'Introducing a Hybrid Method of Radiative Transfer for Smoothed Particle Hydrodynamics', MNRAS, (2009), 394, pp 882-891

**Forgan D.H.**, 'A Numerical Testbed for Hypotheses of Extraterrestrial Life and Intelligence', IJA, (2009), 8, pp 121-131

### CONFERENCE PROCEEDINGS

**Forgan D.H.**, Rice W.K.M., Stamatellos D., Whitworth A.P., 'Introducing a Hybrid Method of Radiative Transfer in Smoothed Particle Hydrodynamics', COOL STARS, STELLAR SYSTEMS AND THE SUN: Proceedings of the 15th Cambridge Workshop on Cool Stars, Stellar Systems and the Sun (2009). AIP Conference Proceedings, Volume 1094, pp. 377-380