ALEXANDER P. HOBBS

Flat A9, Wehntalerstrasse 374
Zurich, Switzerland
CH-8046

tel: +41 (0)764280720
email: alexander.p.hobbs@gmail.com
web: http://www.ics.uzh.ch/∼ahobbs

Professional employment

ZENOTTA AG
Head of Consensus, Zenotta AG, Zug, Switzerland, February 2021 - present.
Senior Algorithm Engineer, Zenotta AG, Zug, Switzerland, November 2019 - February 2021.

Professional research experience

INSTITUTE FOR COMPUTATIONAL SCIENCE, UNIVERSITY OF ZURICH
Postdoctoral researcher, Institute for Computational Science, University of Zurich, Switzerland, September 2016 - September 2019.

INSTITUTE FOR ASTRONOMY, ETH ZURICH
Postdoctoral researcher, Institute for Astronomy, ETH Zurich, Switzerland, November 2010 - September 2014.

Education

UNIVERSITY OF LEICESTER
PhD in Theoretical Astrophysics, STFC funded, viva date 11th October 2010.
Thesis title: 'Supermassive black hole feeding in galactic nuclei'.
Supervisor: Dr. S. Nayakshin

KINGS COLLEGE LONDON
MRes in X-Ray Physics and Imaging, EPSRC funded, September 2006.
Dissertation title: 'Smart X-ray Optics: Propagation modelling of aberrated telescope apertures'.
Supervisors: Prof. A. Michette, Dr. P. Doel.

OXFORD BROOKES UNIVERSITY
MSc in Computing, September 2005.
Dissertation title: 'Visualization software for a binary star system'.
Supervisor: Dr. S. Curtis.

UNIVERSITY OF OXFORD
MA in Physics, July 2004.
Dissertation title: 'An investigation into the chaotic nature of the stellar dynamo'.
Supervisor: Dr. G. Bryan.

Awards and Scholarships

STFC Studentship, University of Leicester, 2006-2009
EPSRC Studentship, King's College London, 2005-2006
UROP Award, Imperial College, 2004

Computational skills

Programming experience in C, C++, IDL, Python, Perl and Java
Familiarity with Microsoft Windows, Linux, and UNIX operating systems

Proficient in Microsoft Office, Matlab, Maple, Gnuplot and LaTeX software packages

Experience with numerical hydrodynamics: SPH (GADGET-3), meshless (GIZMO), AMR (RAMSES) codes
Experience with equilibrium and non-equilibrium astrochemistry packages (Grackle, KROME)
Experience with high-performance parallel computing, on distributed memory (MPI) platforms

Teaching experience

ETH ZURICH
Tutorial assistant for MSc 'Computational astrophysics' *course*
Tutorial assistant for MSc 'Dark matter' *course*
Demonstrator/assistant for 1st year practical labs

UNIVERSITY OF LEICESTER
Seminar tutor for 1st, 2nd and 3rd year undergraduate courses
1st & 2nd year Mathematical Physics
2nd year Condensed matter
2nd year Electromagnetic fields
3rd year Quantum mechanics
3rd year Atoms and Nuclei

iTEACH PARTNERSHIP
Online seminar tutor in Physics
Providing tutoring online for the physics section of the iTeach PGCE programme

Conferences attended

Good sense and dominant ideology in galaxy and planet formation and evolution - Ascona, Switzerland, July 2014
- *contributed talk 'Positive feedback in galaxy formation: superbubble-driven accretion flow'*

2nd meeting of the AGORA collaboration - Santa Cruz, California, USA, August 2013
- *invited talk 'Black hole accretion and feedback'*

Galaxy formation workshop - Santa Cruz, California, USA, August 2013
- *contributed talk 'Positive feedback in galaxy formation: connecting small to large scales'*

'Mind the gap' conference - IOA, Cambridge, United Kingdom, July 2013
- *contributed talk 'Galaxy formation with SPHS'*

Code workshop - MPA, Munich, Germany, February 2013

New horizons in Computational Astrophysics - Astrosim conference, Davos, Switzerland, February 2012
- *contributed talk 'Galaxy formation with SPHS'*

The central kiloparsec of galactic nuclei, Bad Honnef, Germany, August 2011
- *contributed talk 'Simulating galaxy formation: sub-grid models at the intermediate scale'*

Meeting of the Swiss Physical Society, Lausanne, Switzerland, June 2011
- *contributed talk 'Modelling galaxy formation with multi-scale techniques'*

Assembling the puzzle of the Milky Way, Le Grand-Bornand, France, April 2011

Computational physics with GPUs, Lund Observatory, Sweden, November 2010
- *contributed talk 'Intermediate-scale sub-grid models for galaxy formation'*

Angular momentum transport and energy release in accretion discs, IOA, Cambridge, September 2009
- *presented poster 'AGN feeding and circumnuclear disc formation through supersonic turbulence'*

UK SPH Forum, Nottingham, August 2009

Frontiers in Computational Astrophysics: The Origin of Stars, Planets and Galaxies, Ascona, July 2008

UK National Astronomy Meeting, Queen's University, Belfast, March 2008
- *presented poster 'Accretion and star formation in the central parsec of the Milky Way'*

From stars to galaxies, ETH Zurich, 2007
- *presented poster 'Simulations of cloud-cloud collisions in the Galactic inner parsec'*

N-body dynamics in near-Keplerian potentials, Lorentz Center, Leiden, May 2007

Summer schools attended

International School on Astro-Computing: Galaxy Simulations, UC Santa Cruz, California, July-August 2010
Adaptive mesh refinement codes ART, Enzo, and Ramses; smoothed particle hydrodynamics codes GADGET, Arepo, and Gasoline; visualisation and radiative transfer code Sunrise.

Constellation school on Numerical Astrophysics and its role in star formation research, Cardiff, January 2009
N-body dynamics, radiation transport, the energy equation and chemistry, smoothed particle hydrodynamics, finite difference hydrodynamics, early stellar evolution.

Parallel Programming and HPC Workshop, Manchester, 2007
Introduction to HPC, OpenMP, Introduction to MPI, Advanced MPI, Code Optimization.

Frontiers in Numerical Gravitational Astrophysics, Erice, Sicily, June 2008
Stars: final evolutionary phases, compact interacting objects and gravitational waves, relativistic hydrodynamics, stellar systems: from small to large N-body problems, large and small scale structure in the Universe, supercomputing methods and tools.

Seminars/talks given

Institute for Computational Science, UZH, March 2017
- *Research seminar: 'Positive feedback in models of inside-out galaxy formation'*

Ascona, Switzerland: Good sense and dominant ideology in galaxy and planet formation formation and evolution, July 2014
- *Contributed talk: 'Positive feedback in galaxy formation: superbubble-driven accretion flow'*

UCSC, Santa Cruz, California, USA: 2nd meeting of the AGORA collaboration, August 2013
- *Invited talk: 'Black hole accretion and feedback'*

UCSC, Santa Cruz, California, USA: Galaxy formation workshop, August 2013
- *Research colloquium: 'Positive feedback in galaxy formation: connecting small to large scales'*

IOA, Cambridge: 'Mind the gap: from microphysics to large-scale structure in the Universe', July 2013
- *Research colloquium: 'Galaxy formation with SPHS'*

MPIA, Heidelberg, Germany, March 2012
- *Research colloquium: 'Galaxy formation with the SPHS algorithm'*

Davos, Switzerland: 'Astrosim: New horizons in Computational Astrophysics', February 2012
- *Contributed talk: 'Galaxy formation with SPHS'*

Bad Honnef, Germany: 'The central kiloparsec in galactic nuclei', August 2011
- *Contributed talk: 'Simulating galaxy formation: sub-grid models at the intermediate scale'*

Lausanne, Switzerland: 'Meeting of the Swiss Physical Society', June 2011
- *Contributed talk: 'Modelling galaxy formation with multi-scale techniques'*

Institute for Astronomy, ETH Zurich, May 2011
- *Research colloquium: 'Simulating galaxy formation: multi-scale techniques for sub-grid modelling'*

Institute for Theoretical Physics, University of Zurich, March 2011
- *Invited talk: 'Simulating galaxy formation: sub-grid models at the intermediate scale'*

Lund Observatory, Sweden, workshop: 'Computational physics with GPUs', November 2010
- *Contributed talk: 'Intermediate-scale sub-grid models for galaxy formation'*

Department of Physics and Astronomy, University of Leicester, October 2010
- *Lunchtime seminar: 'Galaxy formation: sub-grid models at the intermediate scale'*

Department of Physics and Astronomy, University of Leicester, May 2010
- *Lunchtime seminar: 'AGN feeding: the intermediate scale'*

Refereed publications

Positive feedback at the disc-halo interface
Alexander Hobbs, Robert Feldmann, 2020, MNRAS, 498, 1140

Spurious haloes and discreteness-driven relaxation in cosmological simulations
Chris Power, Aaron Robotham, Daniel Obreschkow, **Alexander Hobbs**, Geraint Lewis, 2016, MNRAS, 462, 474

nIFTy galaxy cluster simulations - IV. Quantifying the influence of baryons on halo properties
Weiguang Cui, Chris Power, Alexander Knebe, Scott Kay, Federico Sembolini, Pascal Elahi, Gustavo Yepes, Frazer Pearce, Daniel Cunnama, Alexander Beck, Claudio Dalla Vecchia, Romeel Dav, Sean February, Shuiyao Huang, **Alexander Hobbs**, Neal Katz, Ian McCarthy, Giuseppe Murante, Valentin Perret, Ewald Puchwein, Justin Read, Alexandro Saro, Romain Teyssier, Robert Thacker, 2016, MNRAS, 458, 4052

NOVel Adaptive softening for collisionless N-body simulations: Eliminating 'spurious' halos
Alexander Hobbs, Oscar Agertz, Justin Read, Francesca Iannuzzi, Chris Power, 2016, MNRAS, 458, 468

nIFTy galaxy cluster simulations - I. Dark matter and non-radiative models
Federico Sembolini, Gustavo Yepes, Frazer Pearce, Alexander Knebe, Scott Kay, Chris Power, Weiguang Cui, Alexander M. Beck, Stefano Borgani, Claudio Dalla Vecchia, Romeel Dav, Pascal Jahan Elahi, Sean Februrary, Shuiyao Huang, **Alexander Hobbs**, Neal Katz, Erwin Lau, Ian McCarthy, Guiseppe Murante, Daisuke Nagai, Kaylea Nelson, Richard Newton, Valentin Perret, Ewald Puchwein, Justin Read, Alexandro Saro, Joop Schaye, Romain Teyssier, Robert Thacker, 2016, MNRAS, 457, 4063

Growing galaxies via superbubble-driven accretion flows
Alexander Hobbs, Justin Read, Andrina Nicola, 2015, MNRAS, 452, 3593

AGN feedback models: correlations with star formation and observational implications of time evolution
Robert Thacker, C. MacMackin, J. Wurster, **Alexander Hobbs**, 2014, MNRAS, 443, 1125

Black hole feedback in a multiphase interstellar medium
Martin Bourne, Sergei Nayakshin, **Alexander Hobbs**, 2014, MNRAS, 441, 3055

The AGORA High-Resolution Galaxy Simulations Comparison Project
The AGORA collaboration, 2014, ApJS, 210, 14

The formation of entropy cores in non-radiative galaxy cluster simulations: SPH versus AMR
Chris Power, Justin Read, **Alexander Hobbs**, 2014, MNRAS, 440, 3243

Thermal instabilities in cooling galactic coronae: fuelling star formation in galactic discs
Alexander Hobbs, Justin Read, Chris Power, David Cole, 2013, MNRAS, 434, 1849

On the modelling of accretion onto supermassive black holes
Alexander Hobbs, Chris Power, Sergei Nayakshin, Andrew King, 2012, MNRAS, 421, 3443

Feeding SMBHs through supersonic turbulence and ballistic accretion
Alexander Hobbs, Sergei Nayakshin, Chris Power, Andrew King, 2011, MNRAS, 413, 2633

Dynamic Monte-Carlo radiation transfer in SPH: Radiation pressure force implementation
Sergei Nayakshin, Seung-Hoon Cha, **Alexander Hobbs**, 2009, MNRAS, 397, 1314

Simulations of the formation of stellar discs in the Galactic centre via cloud-cloud collisions
Alexander Hobbs and Sergei Nayakshin, 2009, MNRAS, 394, 191

The X-ray emission of Lyman-break galaxies
E. S. Laird, K. Nandra, **A. Hobbs**, C. C. Steidel, 2006, MNRAS, 373, 217

Non-refereed publications

Growing supermassive black holes: sub-grid modelling and intermediate-scale processes
Alexander Hobbs
'The Central Kiloparsec in Galactic Nuclei', AHAR2011, Cologne, Germany, August 2011

Simulations of the formation of a gaseous disc and young stars near Sgr A* via cloud-cloud collisions
Sergei Nayakshin and **Alexander Hobbs**
'The Universe under the Microscope', Bad Honnef, Germany, April 2008

Referees:

Prof. Justin Read
Dept. of Physics
University of Surrey
j.read@surrey.ac.uk
+44 (0)1483 68 3479

Prof. Sergei Nayakshin
Dept. of Physics and Astronomy
University of Leicester
sergei.nayakshin@astro.le.ac.uk
+44 (0)116 252 2454

Prof. Chris Power
International Centre for Radio Astronomy Research
University of Western Australia
chris.power@uwa.edu.au
+61 (0) 8 64887630