Tom Hands: Curriculum Vitae

Date of Birth: 21st June 1990
Citizenship: British Citizen

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ADS publications list

Institute for Computational Science
University of Zurich
Winterthurerstrasse 190
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Research Interests

I am mainly interested in understanding the formation and subsequent evolution of both our Solar system and extra-solar planets, and performing numerical modelling of these problems. In particular, I am currently using N-body methods to understand the objects of the outer Solar system, and a combination of N-body, hydrodynamic and viscous accretion disc modelling techniques to gain insight into the observed distribution of exo-planets. I am also interested in the development and improvement of a wide variety of numerical techniques.

Education, Research & Post-Doctoral Experience

Oct 2016–Present **University of Zürich**
Post-doctoral Research Assistant
- Modelling outer solar-system dynamics and continuing my work in planetary migration.
- Organiser of institute journal club, "planetary science" journal club and "Student Seminar" series
- Supervisors: Dr. Joachim Stadel, Prof. Dr. Ben Moore

June–Sept. 2016 **University of Leicester**
Post-doctoral Research Assistant
- Continuing my thesis research in the field of exoplanets.
- Supervisor: Dr. Richard Alexander

2012–2016 *PhD in Astrophysics*
- Thesis title: "The enthralling tale of the formation and evolution of compact planetary systems".
- Supervisor: Dr. Richard Alexander, awarded: August 2016

2008–2012 *MPhys (Physics) with First Class Honours*
- Dissertation title: "The trajectory of emboli in the major cerebral arteries".
- Supervisor: Dr. Emma Chung.

2011 *Summer Studentship*
- Title: "Artifical Conductivity in Smoothed Particle Hydrodynamics".
- Supervisor: Prof. Walter Dehnen.

Awards

- Won the 2013 Open Exoplanet Catalogue visualisation prize for exoplanet visualisation website (`http://tomhands.com/exovis/`).
- Awarded departmental prize for being the top performing final year MPhys (Physics) student.
- STFC PhD studentship.

Research Visits

2018/10 University of Surrey (1 day) - Host: Dr. Alessia Gualandris
2016/11 University of Leicester (5 days) - Host: Dr. Richard Alexander
2014/07 University of Surrey (2 days) - Host: Dr. Alessia Gualandris

Teaching Experience

2014 Acted as a demonstrator in a 3rd year C++ course, helping undergraduates to work through C++ problems.

Skills & Experience

Computational:

- Experienced in C, C++, Python, R, OpenCL and Java development.
- Working knowledge of FORTRAN.
- Wide variety of numerical modelling experience, including N-body, finite difference (`FARGO-3D`), finite volume (`PLUTO`) and Smoothed Particle Hydrodynamics.
- Understanding of code development and optimisation on a variety of platforms, including parallel, vector and GPU computing.

Other:

- Languages: English (native), German (Up to ELP B2 level)

Selected Press Coverage

2018/2019 *"Ruby and Sapphire" planets*

- Forbes; Science Daily

2014 *Exoplanet fly-by video*

- Huffington Post; CNET; Gizmodo; Yahoo; Space.com; Universe Today

Community Service & Outreach Experience

2015-present Referee for *Computer Physics Communications*

2014/08 *Halloween Physics Spooktacular* - University of Leicester

2014/04 *Exoplanet fly-by video* - YouTube video with over 65,000 views designed to demonstrate the vast variety of planetary systems to a general audience (`https://www.youtube.com/watch?v=Nw_KfDEypTY`).

2014/01 *Stargazing Live* - University of Leicester

2013 *ExoVis* - Developed the exoplanet visualisation tool *ExoVis* to aid with the visualisation of exoplanetary systems (`http://tomhands.com/exovis/`).

Selected Conference Attendance & Talks

2018/11 *Take a Closer Look*, Garching, Germany (Poster)

2018/06 *Gravitational Instability Workshop*, Leicester, UK

2018/06 *1st Phantom European Users Workshop*, Milan, Italy

2018/04 *Exoplanet UK Community Meeting*, Oxford, UK (Poster)

2017/11 *Numerical Simulations of Planet-Disc Interactions*, Cuernavaca, Mexico (Contributed Talk)

2017/06 *EPSC 2017*, Riga, Latvia (Contributed Talk)

2017/06 *PASC 2017*, Lugano, Switzerland

2017/03 *Theoretical Astrophysics Seminar*, University of Zurich (Invited Talk)

2017/03 *UK Community Exoplanet Conference 2017*, St. Andrews, Scotland (Poster)

2017/02 *Carving Through The Codes*, Davos, Switzerland

2015/10 *Computational Astrophysics with GANDALF*, Freising, Germany

2015/07 *Disk Dynamics and Planet Formation*, Larnaka, Cyprus (Poster)

2015/05 *Exoplanets in Lund 2015*, Lund, Sweden (Poster)

2015/04 *UK Community Exoplanet Conference 2015*, Warwick, UK (Contributed talk)

2015/03 *45th Saas-Fee Advanced Course: From Protoplanetary Disks to Planet Formation*, Les Diablerets, Switzerland (Poster)

2014/09 *Visiting seminar*, University of Nottingham, Nottingham, UK (Invited talk)

2014/09 *Planet Formation and Evolution*, Kiel, Germany (Poster)

2014/07 *IAU symposium 310 on Complex Planetary Systems*, Namur, Belgium (Poster)

2014/04 *Exoplanet UK Community Meeting*, Cambridge, UK (Contributed talk)

2013/07 *UC-HiPACC International Summer School on AstroComputing: Star & Planet Formation*, Santa Cruz, CA, USA

2013/07 *Protostars and Planet VI*, Heidelberg, Germany (Poster)

2013/03 *Characterising Exoplanets*, Royal Society, London, UK (Poster)

Tom Hands: Publication Record

Summary

3 first-author, published, peer-reviewed journal articles with 27 total citations. 2 co-authored, published, peer-reviewed journal articles with 3 total citations. 1 IAU conference proceedings. 1 submitted first-author journal article.

Refereed Journal Articles

5) *A new class of Super-Earths formed from high-temperature condensates: HD219134 b, 55 Cnc e, WASP-47 e*
Dorn, C., Harrison, J. H. D., Bonsor, A., **Hands, T. O.**
2018, MNRAS
ADS — ArXiV

4) *The origin of the structure of large–scale magnetic fields in disc galaxies*
Nixon, C. J., **Hands, T. O.**, King, A. R., Pringle, J. E.
2018, MNRAS, 477, 3259
ADS — ArXiV

3) *Breaking mean-motion resonances during Type I planet migration*
Hands, T. O., Alexander, R. D.
2018, MNRAS, 474, 3998
ADS — ArXiV

2) *There might be giants: unseen Jupiter-mass planets as sculptors of tightly-packed planetary systems*
Hands, T. O., Alexander, R. D.
2016, MNRAS, 456, 4121
ADS — ArXiV

1) *Understanding the assembly of Kepler's compact planetary systems*
Hands, T. O., Alexander, R. D., Dehnen, W.
2014, MNRAS, 445, 749
ADS — ArXiV

Submitted Journal Articles & Pre-prints

1) *The fate of planetesimal discs in young open clusters: implications for 1I/'Oumuamua, the Kuiper belt, the Oort cloud and more*
Hands, T. O., Dehnen, W., Gration, A., Stadel, J., Moore, B.
2019, MNRAS
ADS — ArXiV

Conference Proceedings

1) *Understanding the assembly of Kepler's tightly-packed planetary systems*
Hands, T. O., Alexander, R. D., Dehnen, W.
2014, Complex Planetary Systems, Proceedings of the International Astronomical Union, 310, 90-92
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