Dr. Harry A. Ballantyne

Salmenstrasse 13, 4127 Birsfelden, Switzerland
+41 767 990 982 | harryballantyne96@gmail.com | harryballantyne.github.io |
DOB: 14/02/1996 | Nationality: British | Swiss work permit: B

Employment

01/2024–Present
Research associate, University Hospital Basel, Switzerland (Supervisor: Prof. Gunther Meinlschmidt)
- Research on using AI-based methods for better understanding of mental, psychosocial and psychosomatic stress and disease
- Using large language models (LLMs) via the Hugging Face platform to simulate and investigate psychotherapeutic treatment

09/2022–12/2022
Postdoctoral research associate, University of Bern, Switzerland (Supervisor: Dr. Martin Jutzi)
- Performing, analysing and writing up publications on the results of smoothed-particle hydrodynamics (SPH) impact simulations
- Main research focus was on the impact-origin of Sputnik Planitia, a huge, ice-filled structure that dominates Pluto's surface

08/2018–09/2022
PhD student, University of Bern, Switzerland (Supervisor: Dr. Martin Jutzi)
- Primary focus on smoothed-particle hydrodynamics (SPH) impact simulations using SPHLATCH, a code in C++ and Python
- Teaching roles, including leading lab courses and designing/marking Master's level exams

Education

EPFL Extension School *Switzerland*
Certificate of Open Studies (COS) on Applied Data Science: Machine Learning *12/2023 - Present*
- 15 ECTS credits

University of Bern *Switzerland*
PhD in Physics with special qualification in Astronomy *08/2018 - 09/2022*
- Advisor: Dr. Martin Jutzi
- Thesis title: Planetary-scale impacts and their geophysical consequences
- Grade: Summa cum laude honours

University of Sheffield *United Kingdom/Australia*
MPhys Physics and Astrophysics with Study Abroad *09/2014 - 06/2018*
- Advisor: Dr. Richard Parker
- Thesis title: The effects of binary evolution on planet formation
- Grade: First class honours
- Study Abroad: One year as an exchange student at Monash University, Australia

Skills

Programming Languages:

Python ★★★★★ *C++* ★★★★★ *Bash* ★★★★★ *Latex* ★★★★☆ *R* ★★★★☆
Fortran ★★★★☆ *MatLab* ★★★☆☆ *Excel* ★★★☆☆ *HTML* ★★☆☆☆ *CSS* ★★☆☆☆

Version Control:

Git

Languages:

English (native), German (A2 level)

Publications

Published

Cheng, K. W., Rozel, A. B., Golabek, G. J., **Ballantyne, H. A.**, Jutzi, M. & Tackley, P. J. Mars' crustal and volcanic structure explained by southern giant impact and resulting mantle depletion. Geophysical Research Letters (in press).

Ballantyne, H. A., Jutzi, M., Golabek, G. J., Mishra, L., Cheng, K. W., Rozel, A. B. & Tackley, P. J. (2023). Investigating the feasibility of an impact-induced Martian Dichotomy. Icarus, 392, 115395. doi:10.1016/j.icarus.2022.115395

Ballantyne, H. A., Espaas, T., Norgrove, B. Z., Wootton, B. A., Harris, B. R., Pepper, I. L., Smith, R. D., Dommett, R. E., Parker, R. J. (2021). Long-term stability of planets in and around binary stars. MNRAS, 507, 4507. doi:10.1093/mnras/stab2324

In Review

Ballantyne, H. A., Asphaug, E., Denton, C. A., Emsenhuber, A. & Jutzi, M. Sputnik Planitia as an impactor remnant indicates an ancient rocky mascon in an oceanless Pluto. Nature Astronomy (in review).

Cheng, K. W., **Ballantyne, H. A.**, Golabek, G. J., , Jutzi, M., Rozel, A. B. & Tackley, P. J. Combined impact and interior evolution models in three dimensions indicate a southern impact origin of the Martian Dichotomy. Icarus (in review).

Mentoring

03/2021–09/2021	**Janis Witmer (co-supervised)**, Bachelor's student, Project: *Hit-and-run simulations of the Psyche forming impact*	*University of Bern*

Teaching Experience

09/2022–12/2022	**Physics for medicine majors (bachelor's course)**, Teaching assistant for experiments and seminars
02/2022–05/2022	**Physics practical course for biology majors (bachelor's course)**, Teaching assistant for experiments
02/2021–09/2021	**Advanced statistical methods for physicists (master's course)**, Teaching assistant and examiner
02/2020–05/2020	**Physics I practical course**, Teaching assistant for experiments

Presentations

Extensive experience presenting to a large audience, including international conferences such as:

- Lunar and Planetary Science Conference, Houston, USA (2021, 2022)
- Europlanet Science Congress, Various European Locations (2019, 2020, 2021, 2022)
- European Geosciences Union General Assembly, Vienna, Austria (2019)

Invited talks at various prestigious institutes including:

- University of Zurich (Zurich Planetary Seminar, 2022)
- Deutsches Zentrum für Luft und Raumfahrt, Berlin (3rd Workshop on Giant Collisions, 2022)
- ETH Zurich (ETH Zurich Planetary Geophysics Seminar, 2020)

Referees

Dr. Martin Jutzi, University of Bern, Gesellschaftstrasse 6, 3012 Bern, Switzerland, martin.jutzi@unibe.ch, +41 31 684 85 49

Prof. Erik Asphaug, Lunar and Planetary Laboratory (LPL), University of Arizona, 1629 E. University Boulevard, Tuscon, 85721, Arizona, USA, asphaug@lpl.arizona.edu

Prof. Brice-Olivier Demory, University of Bern, Gesellschaftstrasse 6, 3012 Bern, brice.demory@unibe.ch