Christoph Becker

Physics PhD Candidate

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Education

Durham University
Durham, UK

Doctor of Philosophy in Physics
October 2017 - 2021

- Developer of the new analysis pipeline or cosmological simulation `Astrild`*.
- Developer of the new cosmological N-body code to explore novel theories of gravity `ECOSMOG-CVG`*.
- Co-developer of the on-the-fly ray-tracing code for N-body simulations `Ray-RAMSES`*.
- Lead developer of the individual-based modular simulation framework `JUNE`*, which is used to guide policymakers in the UK.
- Contributor to the identification and publication of key policy challenges for the universities insight series on data for public good.
- Co- and authored three published works and four are in preparation.
- Set up an international network of collaborators.

Ludwig Maximilian University of Munich
Munich, Germany

Master of Science in Physics
October 2015 - October 2017

- Won scholarship to support my research on hydrodynamic simulations of galaxies at INAF (Italy/Trieste).

Delft University of Technology & Leiden University
Delft, Netherlands

Bachelor of Science in Physics & Mechanical Engineering
October 2011 - October 2015

- Won awards to presented at international conferences.
- Co-authored four published works on hybrid rocket engines and space debris.

Experience

DATACTIVE
Amsterdam, Netherlands

Developer
Jan 2021 - Present

- Improving and enhancing `BigBang`*, a software for scientific analysis of Internet standards development and Internet governance communities.

Institute for Data Science
Durham, England

Lead Developer
March - June 2020

- As part of the Royal Society's Rapid Assistance in Modelling the Pandemic (RAMP) initiative, I contributed to efforts to understand the spread of SARS-CoV-2 in the UK using Agent-based models.
- To support local hospitals and authorities worked together with a interdisciplinary research group.

Pervasive Technologies
Barcelona, Spain

Data Scientist/Machine Learning Engineer
July - November 2019

- Satellite Asset Monitoring: Co-developed a platform for real-time monitoring and failure prediction of renewable energy assets.
- AI powered planograms: Co-developed a software to support retail management through image recognition an graph neural network analysis.

Honors & Awards

2018	GGDOT October Hacknight,	For most insight-full data-analysis of the NDNS data-set.
2017	STFC-CDT Studentships,	Full scholarship to support students undertaking a PhD in the UK.
2017	Erasmus Scholarship,	To support my research visit to the National Institute for Astrophysics (INAF) in Italy/Trieste.
2016	MINT Excellence Cluster,	For outstanding academic achievements.
2013	Royal IHC Teamwork Award,	In recognition of the development of a new hybrid rocket engine.
2013	2nd Years Science Project Award,	For a team project on the design and production of human powered elevation system.
2013	ESA Education Sponsorship,	For my work on mitigating the hazard of space debris.

Selected Publications

In Prep.	Towards policies for data for the public good.	
In Prep.	On the Possibility of Pairwise Transverse Velocity Estimates with the Rees-Sciama Effect	
In Prep.	A tree grows in Illustris TNG: the galaxy-halo connection learned by decision trees	
Submitted	The impact of line-of-sight structures on measuring H_0 with strong lensing time-delays*	arxiv: 2006.08540
Submitted	Proca-stinated cosmology II: Matter, Halo, and Lensing Statistics in the vector Galileon*	arxiv: 2011.01719
Published	Proca-stinated cosmology I: A N-body code for the vector Galileon*	JCAP: 10 (2020) 055

Selected Presentations

CONFERENCES

Jan. 2020	Talk	16th Durham-Edinburgh eXtragalactic Workshop*	Durham, UK
Aug. 2019	Talk	Cosmo19	Aachen, Germany
Jan. 2019	Talk	15th Durham-Edinburgh eXtragalactic Workshop*	Edinburgh, UK
Jun. 2018	Talk	1st Durham University STFC Centre for Doctoral Training in Data Intensive Science Conference	Durham, UK
Jun. 2017	Talk	4th HBP School - Future Computing	Obergurgl, Austria

SEMINARS

Nov. 2020	Talk	Durham Research Methods Centre*	Durham, UK
Apr. 2020	Talk	Institute for Data Science - Friday Seminar*	Durham, UK
Jul. 2019	Talk	Kavli Institute for the Physics and Mathematics of the Universe	Tokyo, Japan
Apr. 2019	Talk	Gravitational Lensing Group	Durham, UK
Mar. 2019	Talk	Modified Gravitational Group	Durham, UK
May 2018	Talk	Gravitational Lensing Group	Durham, UK
Jul. 2017	Talk	Prof. K. Dolag's Group, Ludwig Maximilian University of Munich	Munich, Germany
Mar. 2017	Talk	Prof. S. Borgani's Group, University of Trieste	Trieste, Italy

Skills

Programming	Python (7 yrs), Fortan (4 yrs), Bash (4 yrs), Matlab (4 yrs),C/C++ (1 yr), Julia(1 yr), Scala (1 yr)
Computing	Five years experience using Tier-1 HPC facilities.
Documenting	LaTeX, Microsoft Word, LibreOffice Writer Google Docs
Web	Git, Google Cloud Platform and Colaboratory, Comet.ml, HTML(5)
Languages	German (native), English (fluent), Dutch (proficient)
Music	Played the third clarinet in the symphonic orchestra of the AGV in Munich and the Durham Concert Band

Community involvement

Dec. 2020-	Journal of Open Source Software, Reviewer of open-source research software for astrophysics and cosmology.
Nov. 2020-	Durham Research Methods Centre, Organise, moderate, and publish essays on conversations about new approaches for data analysis in a social science context.
Apr. 2019	Schools' Science Festival, Demonstrator for 'Cosmic Cookery: Growing Galaxies in a Computer'
Jun. 2018	Open day for schools, Demonstrator for 'Modelling the invisible'
2017/18	Staff-Student Consultative Committee, Represented postgraduate needs and interests at the board of studies meetings.

Teaching Experience

2019/21	Durham University, Workshop demonstrator for Level 3 Mathematics Workshop
2018/19	Durham University, Workshop demonstrator for Level 2 Computational Physics