Simon Daley-Yates

https://sddyates.github.io/

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PROFILE

I am an early career academic who specialises in high performance computation in the field of stellar and planetary atmospheres. This topic requires the use of modern numerical computational techniques to extract the highest levels of efficiency from current computing resources. Currently I develop high performance codes for petabyte scale simulations using heterogeneous programming frameworks, I am also develop HPC-python simulation and analysis. I am therefore looking for a dynamic research group, in which I hope to apply my knowledge of these computational techniques. Please click on the link above to view my website.

EDUCATION AND EMPLOYMENT

Oct 2018 - Present: Maison de la Simulation, CEA-Scalay, France
Post-doc position developing numerical codes for the study of planetary atmospheres as part of an ERC grant funded research group ATMO, under Dr Pascal Tremblin.
2014 - 2018: University of Birmingham, UK
PhD in Computational Astrophysics
Thesis: "Radio Emission from Hot Stars and Planets"
STFC funded, supervised by Dr Ian Stevens
2010 - 2014: University of York, UK
MPhys. (First class with Honours) Theoretical Physics
Dissertation: "Low-Temperature Atmospheric Pressure Plasma Jets for Biomedical Applications"
Modules: Fluids, Fusion Plasma Physics, Astrophysical Plasmas, High Performance Computing

RECENT PUBLICATIONS

Thermo-compositional diabatic convection in extra solar atmospheres, I. Super-earths
Daley-Yates S., Tremblin P., Padioleau T., 2020, in prep
3D MHD simulations and synthetic radio emission from an oblique rotating magnetic massive star
Daley-Yates S., Stevens I. R., 2019, MNRAS, 489, 3251
Hot Jupiter accretion: 3D MHD simulations of star-planet wind interaction
Daley-Yates S., Stevens I. R., 2019, MNRAS, 483, 2600
Inhibition of the electron cyclotron maser instability in the dense magnetosphere of a hot Jupiter
Daley-Yates S., Stevens I. R., 2018, MNRAS, 479, 1194
Winds of Massive Magnetic Stars: Interacting Fields and Flow
Daley-Yates S., Stevens I. R., 2018, COSKA, 48, 129
Interacting Fields and Flows: Magnetic Hot Jupiters
Daley-Yates S., Stevens I. R., 2017, AN, 338, 881
Submillimetre free-free emission from the winds of massive stars in the age of ALMA
Daley-Yates S., Stevens I. R., Crossland T. D., 2016, MNRAS, 463, 2735

PROJECTS AND COLLABORATION

Grand Challenge (2019): As part of my time at Masion de la Simulation I was responsible for running the simulations of the *Grand Challenge* to test the new Frence national GPU based super-computer, *Jean Zay*. The project involved running a hydrodynamic code across 1000 NVIDA V100 GPGPUs over 5 days and producing ~ 100 TB of output files (each file ~ 5.2 TB). This project tested my ability to plan and execute large scale, big data simulations, requiring novel solutions to both data throughput, on-the-fly analysis and post processing.

Compute Time (2020): Contributed to applications for supercomputer time at the French national level, demonstrating the ability to assess project timelines and resource requirements.

PROFESSIONAL AND TECHNICAL SKILLS

Discipline	Language or framework	Experience level
High productivity languages	Python	Daily use for +9 years
Data analysis	Numpy, yt-project, astropy	Daily use for +5 years
Shared memory parallelism	OpenMP	Intermittent use +5 years
Distributed memory parallelism	MPI	Intermittent use +5 years
High performance languages	Fortran, C and C++	Daily use for +5 years
Just in time compilation	Python package Numba	End-user for +3 years
Heterogeneous frameworks	C++ library Kokkos	End-user for +2 years
Version control	Git, GitLab, continuous integration	Daily use for +3 years
Documentation	Markdown and GitHub Wiki	Daily use for +2 years
Collaboration	Slack, Mattermost and Synology	Daily use for +2 years
Meetings	Leading and minute taking	Part of Masters and PhD

CONFERENCES AND INVITED SEMINARS TALKS

Contributed Talk: European Planetary Science Congress, Geneva, 2019
Attended: Extreme Solar Systems IV, Reykjavik, Iceland, 2019
Attended: Solar and Stellar Magnetic Fields, Copiapo, Chile, 2019
Invited Seminar Talk: Observatoire de Paris, Meudon, 2019
Attended: 3rd Conference of Research Software Engineers, 2018, Birmingham, UK, 2018
Invited Seminar Talk: University of Tübingen, Planet Formation Group, 2018
Contributed Talk: Stars With Stable Magnetic Fields, Czech Republic, 2017
Contributed Talk: 14th Potsdam Thinkshop on Stellar Magnetism, Germany, 2017
Contributed Talk: UK Exoplanet Meeting, UK, 2017
Contributed Poster: IAU 329, The Lives and Death-throes of Massive Stars, New Zealand, 2016
Contributed Talk: National Astronomical Meeting, UK, 2015

WORKSHOPS AND SUMMER SCHOOLS

PATC Performance Parallel IO and Postprocessing, MDS, Paris-Scalay, France, 2019
PATC Performance Portability with Kokkos Library, IDRIS, Paris-Saclay, France, 2019
PATC Introduction to CUDA programming, Barcelona, Spain, 2019
6th Les Houches School in Computational Astrophysics, France, 2016
St Andrews Monte Carlo Radiation Transport Summer School, St Andrews, Scotland, 2015

TEACHING EXPERIENCE

Python Instruction: Demonstration and teaching of fundamental programming practices and introduction to the Python language for 1st year undergraduates. The position involved teaching the code components of the python language: object-orientation, function and class definitions and computation with the Numba package. I was also responsible for marking continuous assessment together with end of course projects.

Laboratory Demonstration: Demonstration for 1st year undergraduate electronics and experimental laboratory. Introducing students to the principles of experimental physics and lab book keeping skills. I was responsible for demonstrating several experiments including: analog electronics, γ-ray detector and cosmic-ray detector. I was also responsible for marking lab books and course work assignments.

MENTOR AND OUTREACH ROLES

Mentoring of Student: During the last 3 years, I have had the opportunity to aid in the supervision of students during their dissertation and research work. My role was to introduce and coach students in the use of codes and python simulation analysis tools. This experience places me in an excellent position to assist with the future supervision of research students.

Head Postgraduate Representative for the School of Physics and Astronomy: Responsible for representing the interests of all ($\sim$200) postgraduate students in the school of Physics and Astronomy. In this position I attended the Postgraduate Committee, liaising with staff to ensure the interests of postgraduates were safeguarded.

Outreach: Volunteering in numerous outreach events, representing the University of Birmingham at museums, local schools and events around the country. These activities included demonstration equipment to explain concepts such as the curvature of space time, gravitational wave detection and exoplanet detection.

INTERNSHIPS

Research internship (2013): Summer paid internship at the University of York Plasma Institute. In this role, I worked on developing numerical tools to investigate the chemical evolution in plasma jets designed for use in biomedical treatment.

Teaching internship (2012): Summer paid internship at the University of York with the aim of developing on-line teaching materials for the Electromagnetic and Optics undergraduate module; providing me with experience of teaching in an academic context, using digital platforms such as Blackboard.

REFERENCES

Dr Ian Stevens	Dr Pascal Tremblin	Dr Asif ud-Doula
School of Physics and Astronomy	Maison de la Simulation	Department of Physics
University of Birmingham	USR 3441	Penn State Worthington Scranton
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