

# Jesse Patrick Harrison, PhD

jesse.harrison@csc.fi | [Personal Website](#) · [Google Scholar](#) · [GitHub](#) · [LinkedIn](#)

## QUALIFICATIONS SUMMARY

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- Senior Data Scientist / Project Manager with diverse experience in biodiversity, environmental and life science research
- Proficient in data analysis (e.g. R, bioinformatics), scientific computing and coordinating international research projects
- Combined experience of client-facing, technical and advisory roles, with proven problem-solving and interpersonal skills

## EMPLOYMENT

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### CSC - IT Center for Science Ltd

*Project Manager, Senior Data Scientist (2022 -)*

*Data Scientist (2019 - 2022)*

2019 - Present

Espoo, Finland

### Research Project Management and Collaborations

- Project Manager, [Horizon Europe Biodiversity Digital Twin](#) (funding: €11M)
- Work Package Lead, [Horizon 2020 HPC/Exascale Centre of Excellence in Personalised Medicine](#) (funding: €5M)
- Collaborator, Horizon Europe DTO-BioFlow (integration of biodiversity data into the [Digital Twin Ocean](#)) (funding: €10M)
- Method development and data analysis support, [ERC LIFEPLAN \(Planetary Inventory of Life\)](#) (funding: €12M)

### Technical Competence

- [R container](#) design and maintenance on CSC computing environments, including GIS software installations and user support
- Developed data analysis tools for the [Chipster platform](#), including [tools for assessing microbial community diversity](#)
- Experienced in bash scripting, parallel computing, multivariate statistics and reproducible coding

### Teaching Experience

- Lead instructor on R courses (e.g. [Data Analysis with R](#))
- Co-instructor, [Puhti RStudio Workshop](#) and [Microbial Community Analysis with Chipster](#)

### Postdoctoral Researcher

*Turku Bioscience (2018 - 2019)*

*University of Helsinki (2017 - 2018)*

*University of Vienna (2015 - 2017)*

*The University of Edinburgh (2012 - 2015)*

2012 - 2019

Turku, Finland

Helsinki, Finland

Vienna, Austria

Edinburgh, UK

- Track record in cross-disciplinary research (biogeochemistry, microbial ecology, analytical chemistry and astrobiology)
- Topics including plastic pollution, eDNA-based ecosystem monitoring and bioinformatics as part of [NASA BASALT](#)
- Supervisor of six Masters projects and laboratory course instructor ([International FISH Course, University of Vienna](#))
- Contributed to developing a [Massive Open Online Course \(MOOC\) in astrobiology](#) with 80K registrations to date

### UK Department for Environment, Food and Rural Affairs

*Technical Advisory Group Member*

2014- 2015

London, UK

- Invited member of expert panel providing advice on plastic biodegradability in the environment
- Contributed to a [summary report presented to the UK Parliament](#), lead author of [accompanying publication](#)

## SKILLS

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- **Strategic and Interpersonal Skills:** Project design and procurement, experimental design, steering and management, cross-disciplinary teamwork, project supervision
- **Data Analysis:** Data wrangling and visualisation, multivariate statistics and machine learning, high-performance computing, sequencing data analysis, preparing technical reports and policy documents, code development, version control
- **Laboratory Methods:** PCR, NGS, FISH, FT-IR and Raman microspectroscopy, SEM, microbial culturing

## EDUCATION, TRAINING AND ACADEMIC TITLES

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### University of Helsinki (2023)

Helsinki, Finland

Title of Docent (Associate Professor)

*Environmental Sciences*

### Athena Research Center (2019)

Athens, Greece

Data Carpentry Instructor

### The University of Sheffield

Sheffield, UK

PhD (2012)

*Molecular Environmental Microbiology and Infrared Microspectroscopy*

MBiolSci, 1st Class Hons (2008)

*Biology with Conservation and Biodiversity*

## COMMITTEES AND PANELS

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### 2021 - Present:

- Finnish Open Research Methods Policy Working Group

### 2015 - Present:

- Grant Reviewer (French National Research Agency and Portuguese Foundation for Science and Technology)
- Frontiers Review Editor (Microbial Biotechnology / Extreme Microbiology)

### 2013 - 2016:

- PhD Project Steering Committee, Swansea University / Fera Science Ltd, UK)

### 2015:

- European Commission AstRoMap European Astrobiology Roadmap Panel

### 2014:

- Conference Organising Committee, European Astrobiology Network Association

## PUBLICATIONS

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- Citations (Google Scholar): >3000
- H index of 15 and i10 index of 17

### Publications in Refereed Journals

23. Tagg AS, Sperlea T, Labrenz M, **Harrison JP**, Ojeda JJ, Sapp M. 2022. Year-long microbial succession on microplastics in wastewater: chaotic dynamics outweigh preferential growth. *Microorganisms* 10: 1775. [Link](#)
22. **Harrison JP**, Chronopoulou M, Salonen I, Jilbert T, Koho K. 2021. 16S and 18S rRNA gene metabarcoding provide congruent information on the responses of sediment communities to eutrophication. *Frontiers in Marine Science* 8: 862. [Link](#)
21. Pinto M, Polania Zenner P, Langer TM, **Harrison JP**, Simon M, Varela MM, Herndl GJ. 2020. Putative degraders of low-density polyethylene-derived compounds are ubiquitous members of plastic-associated bacterial communities in the marine environment. *Environmental Microbiology* 22: 4779-4793. [Link](#)
20. Tagg AS, Sapp M, **Harrison JP**, Sinclair CJ, Bradley E, Ju-Nam Y, Ojeda, JJ. 2020. Microplastic monitoring at different stages in a wastewater treatment plant using reflectance micro-FTIR imaging. *Frontiers in Environmental Science* 8: 145. [Link](#)
19. Cockell CS, McMahon S, Lim DSS, Rummel J, Stevens A, Hughes SS, Kobs Nawotniak SE, Brady AL, Marteinson V, Martin-Torres J, Zorzano M-P, **Harrison JP**. 2019. Sample collection and return from Mars: Optimising sample collection based on the microbial ecology of terrestrial volcanic environments. *Space Science Reviews* 215: 1-25. [Link](#)
18. Cockell CS, **Harrison JP**, Stevens AH, Payler SJ, Hughes SS *et al.* 2019. A low-diversity microbiota inhabits extreme terrestrial basaltic terrains and their fumaroles: implications for the exploration of Mars. *Astrobiology* 19: 284-299. [Link](#)
17. **Harrison JP**, Boardman C, O'Callaghan K, Delort A-M, Song J. 2018. Biodegradability standards for carrier bags and plastic films in aquatic environments: a critical review. *Royal Society Open Science* 5: 171792. [Link](#)
16. Cockell CS, Biller B, Bryce C, Cousins C, Direito S, Forgan D, Fox-Powell M, **Harrison JP et al.** 2018. The UK Centre for Astrobiology: a virtual astrobiology centre. Accomplishments and lessons learned, 2011-2016. *Astrobiology* 18: 224-243. [Link](#)

15. **Harrison JP**, Berry D. 2017. Vibrational spectroscopy for imaging single microbial cells in complex biological samples. *Frontiers in Microbiology* 8: 675. [Link](#)
14. **Harrison JP**, Angel R, Cockell CS. 2017. Astrobiology as a framework for investigating antibiotic susceptibility: a study of *Halomonas hydrothermalis*. *Journal of The Royal Society Interface* 14: 20160942. [Link](#)
13. Tagg AS, **Harrison JP**, Ju-Nam Y, Sapp M, Bradley EL, Sinclair CJ, Ojeda JJ. 2017. Fenton's reagent for the rapid and efficient isolation of microplastics from wastewater. *Chemical Communications* 53: 372-375. [Link](#)
12. Bryce CC, Le Bihan T, Martin SF, **Harrison JP**, Bush T, Spears B, Moore A, Leys N, Byloos B, Cockell CS. 2016. Rock geochemistry induces stress and starvation responses in the bacterial proteome. *Environmental Microbiology* 18: 1110-1121. [Link](#)
11. Freeman K, **Harrison JP**, Dobinson L, Cockell CS, McKenzie R, Wyllie D, Nixon SL. 2016. Mapping limits to life on Earth. *Astronomy & Geophysics* 57: 2.15-2.17. [Link](#)
10. **Harrison JP**, Aggarwal SD, Cockell CS. 2016. Salinity influences the response of *Halomonas hydrothermalis* to artificial fossilization by evaporative silicification. *Geomicrobiology Journal* 33: 377-386. [Link](#)
9. Horneck G, Walter N, Westall F, Grenfell JL, Martin WF, Gomez F, Leuko S, Lee N, Onofri S, Kleomenis T, Raffaele S, Pilat-Lohinger E, Ernesto P, **Harrison JP et al.** 2016. AstRoMap European Astrobiology Roadmap. *Astrobiology* 16: 201-243. [Link](#)
8. Cockell CS, Bush T, Bryce CC, Direito S, Fox-Powell M, **Harrison JP**, Lammer H, Landenmark H, Martin-Torres J, Nicholson N, Noack L, O'Malley-James J, Payler SJ, Rushby A, Samuels T, Schwendner P, Zorzano MP. 2016. Habitability: a review. *Astrobiology* 16: 89-117. [Link](#)
7. **Harrison JP**, Dobinson L, Freeman K, McKenzie R, Wyllie D, Nixon SL, Cockell CS. 2015. Aerobically respiring prokaryotic strains exhibit a broader temperature-pH-salinity space for cell division than anaerobically respiring and fermentative strains. *Journal of the Royal Society Interface* 12: 20150658. [Link](#)
6. Tagg AS, Sapp M, **Harrison JP**, Ojeda JJ. 2015. Identification and quantification of microplastics in wastewater using FPA-based reflectance micro-FT-IR imaging. *Analytical Chemistry* 87: 6032-6040. [Link](#)
5. **Harrison JP**, Hallsworth JE, Cockell CS. 2015. Reduction of the temperature sensitivity of *Halomonas hydrothermalis* by iron starvation combined with microaerobic conditions. *Applied and Environmental Microbiology* 81: 2156-2162. [Link](#)
4. **Harrison JP**, Schratzberger M, Sapp M, Osborn AM. 2014. Rapid bacterial colonization of low-density polyethylene microplastics in coastal sediment microcosms. *BMC Microbiology* 14: 232. [Link](#)
3. **Harrison JP**, Gheeraert N, Tsigelnitskiy D, Cockell CS. 2013. The limits for life under multiple extremes. *Trends in Microbiology* 21: 204-212. [Link](#)
2. **Harrison JP**, Ojeda JJ, Romero-González ME. 2012. The applicability of reflectance micro-Fourier-transform infrared spectroscopy for the detection of synthetic microplastics in marine sediments. *Science of the Total Environment* 416: 455-463. [Link](#)
1. **Harrison JP**, Sapp M, Schratzberger M, Osborn AM. 2011. Interactions between microorganisms and marine microplastics: a call for research. *Marine Technology Society Journal* 45: 12-20. **Invited paper.** [Link](#)

### Book Chapters, Technical Reports and Policy Documents

3. Open Science Coordination in Finland. 2023. Open research data and methods. National policy and executive plan by the higher education and research community for 2021-2025: Policy component 2 - Open access to research methods and infrastructures. *The Committee for Public Information (TjNK) and Federation of Finnish Learned Societies (TSV)*. **National policy document providing recommendations for the openness of research methods and infrastructures.** [Link](#)
2. **Harrison JP**, Hoellein TJ, Sapp M, Tagg AS, Ju-Nam Y, Ojeda JJ. 2018. Microplastic-associated biofilms: a comparison of freshwater and marine environments. In: *Freshwater Microplastics* (Wagner M, Lambert S, eds). *The Handbook of Environmental Chemistry* 58, pp. 181-201. Springer. **Invited book chapter.** [Link](#)
1. O'Callaghan K, Boardman C, Murphy R, **Harrison JP**, Kosior E, Song J, Delort A-M. 2015. Review of standards for biodegradable plastic bags. *Department for Environment Food & Rural Affairs*. **Technical Advisory Group report presented to UK Parliament.** [Link](#)

### Further Materials

Additional outputs (e.g. posters, project deliverables) can be found on [my website](#).