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Ernest Rutherford Fellowships

Peer Review

STFC Reference: ST/X003833/1

Document Status: With Council

Ernest Rutherford Fellowships 2022

Applicant Details

Applicant	Dr Evan Henry Anders	Organisation	University of Exeter
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Title of Research Project

Improved magnetoconvection models for precision astrophysics
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Review Information

Response Due Date	09/11/2022	Reviewer Reference:	082240182
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Research Council Contact Details

STFC Administration Contact:	Email:	Telephone:
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Overall Assessment

Please include justification for the scores given above and assess against the criteria stated in the reviewer guidance.

Please include comments on: (1) the excellence of the research achievements of the applicant; (2) the potential of the applicant to lead their research discipline; (3) the capability to maximise the potential of others and the ability to be, or become, a clear communicator and disseminator of knowledge; (4) the excellence, timeliness, feasibility, distinctive vision and importance of the proposed research; (5) strategic value within the STFC programme.

This information will be available in the feedback given to the applicant.

- (1) The applicant has an excellent publication record given his career stage. He has several first-author papers in leading international journals, as well as many publications as part of international collaborations. His past research includes a reasonably diverse range of topics, yet with clear themes running through them, demonstrating a growing expertise in his chosen field.
- (2) Stellar convection is a very active area, and the applicant has already established several productive collaborations with leading experts in the USA and Canada. He has identified Exeter as the ideal host for the proposed research, given its existing expertise in stellar fluid dynamics, and I have no doubt that he will become a leading figure in this discipline.
- (3) The whole proposal is well written, managing to concisely convey the aims and objectives of the research in a manner that is readable for a non-specialist, yet with sufficient detail for a specialist audience as well. The applicant is therefore

already adept at communicating his research to a diverse audience. He has an impressive record of mentoring graduate students and developing wider collaborations. This, together with his contributions towards EDI, is clear evidence of his desire to positively impact on others.

(4) The applicant has identified three novel and interesting areas of research in which he has the necessary experience to make progress. He enumerates a series of clearly achievable tasks that will contribute significantly to scientific knowledge. As well as being interesting from a purely theoretical point of view, he also identifies direct links with current and future observations. Tasks 4 and 5 are particularly ambitious, and would certainly make a lasting contribution to the field. Task 3, while certainly feasible, I think is less likely to have a great impact; as the applicant acknowledges, consistency between 3D DNS and 1D stellar models has never really been achieved even under much simpler conditions than will be considered here, so it seems unlikely that a reconciliation between such models can be achieved in full-sphere DNS with imposed magnetic fields. Nevertheless, the results would contribute to the debate regarding convective transport in such objects.

(5) As a study of stellar magnetism, the proposed work builds on past STFC-funded research, and contributes to Science Challenges B1 and B2 concerning stellar interiors and atmospheres. The applicant certainly has excellent potential, and an ERF would greatly enhance his developing career.