**ANNUAL MONITORING FORM 2018**

*This form must be completed electronically and signed by all parties.  Please insert answers in the grey boxes or click on choose an item to select from the drop down lists available.*

*Please note that the Doctoral Academy is unable to accept handwritten, incomplete or unsigned applications.*

**PGR/SUPERVISOR**

*This form should be completed initially by the PGR and then discussed with the Director of Studies before being submitted to the Secretary of the Faculty Research Degrees Committee.* ***All reports are to be submitted by Friday, 29th June 2018.***

**PART A – GENERAL INFORMATION**

**Faculty / School:** Astrophysics Research Institute

**PGR’s Name:** Alexander Lisboa-Wright

**Director of Studies:** Maurizio Salaris

**CURRENT STATUS**

**Mode of Study**: Full Time

**Year of Study:**  Year 1

**Registration:** Approved

**MPhil / PhD Transfer:** In preparation

**Examination arrangements**: N/A

**Expected thesis submission date:** 02/10/2021

**PART B- PGRs COMMENTS**

**B1. Progress** *(to be completed by PGRs)*

**a. Please provide a brief statement of your progress in the last 12 months**

*(if you have successfully obtained ethical approval please include this)*

Since starting this PhD in October 2017, I have investigated the effect of thermohaline mixing in the interiors of low-mass (specifically, solar-mass) stars, using the BaSTI stellar evolution modelling code. My research so far has concluded that, on sufficiently small time-scales in the RGB evolution of a solar-mass star, the initial conditions for thermohaline mixing are present at the expected radial coordinates in the interior and the projected impact of the mixing on local chemical abundances is highly significant on timescales of the order of the time-step resolution of BaSTI in the RGB phase.

I have recently started modelled the variation of ratios of extinctions of the 3 Gaia filters relative to the standard Johnson-V filter, as a function of a target star’s effective temperature, surface gravity and metallicity. So far, my research has shown that the effect of the last two quantities listed above is minimal compared to known observation errors, allowing the variations to be modelled as a function of effective temperature alone. After trialling several different functions, I have decided to use a power-law function of Teff, as this is accurate with regard to reproducing the simulated input data while having relatively few degrees of freedom during fitting. My immediate objectives are to confirm the accuracy of this function form for all the values of surface gravity and metallicity in the input data, and investigate the compatibility of this approach with recent related studies (Casagrande & Vandenberg, in preparation).

**b. Is your progress in line with previously agreed milestones?**

*(eg milestones agreed in your RD9R or during your last annual monitoring report)*

**Where targets for progress have not been met please state why.**

Initial milestones (as detailed in the RD9R Gantt chart, up to, and including most of, the fourth step listed) have been met. However, while the thermohaline mixing equations have been written into the BaSTI model code, and their outputs calculated, they have not been fully implemented into the relevant diffusive-mixing routines. This has subsequently meant that implementation of rotational mixing has not yet begun. Instead, as stated earlier, at the time of writing I am investigating the variation of filter extinction ratios as a function of a target’s effective temperature.

The motivation behind this shift is to be able to acquire presentable, significant results in time for writing the transfer report at the end of Year 1 – the routine for diffusive mixing must be rewritten before adding the code specific to thermohaline mixing.

**c. Please list your targets for the next 12 months**

*(include specific targets with regard to your research activity including the need for ethical approval)*

Finish modelling functions for all target filters, analyse relevant errors and publish. Produce transfer report & undergo associated oral presentation. Implement new diffusion routine in BaSTI (see above), analyse any effects of this, and publish. Begin modelling rotation effects in BaSTI.

**B2. Training and Skills Development** *(to be completed by PGRs)*

**a. Please list all training courses attended in the last 12 months**

**Induction events (PGR, FET, Doctoral Academy), 3i’s training course**

**b. Please provide details of any conferences or seminars you have attended in the last 12 months**

*(where you presented your research either through a poster or oral presentation this should be noted)*

**EWASS 2018**

**FET Research Week – presented poster detailing research on thermohaline mixing**

**c. Please list any publications made during the last 12 months**

*(please indicate if publications are in preparation; submitted; in press or published)*

**N/A**

**d*i*. Have you undertaken any teaching-related activities during the last 12 months?**

*(eg teaching, assessment, demonstrating)*

**If yes please provide further details**

Running revision sessions on physics modules for foundation-year undergraduate engineering students, organised by Dr. Martin Sharp.

**d*ii*. Have you attended the relevant workshops on the University’s 3i’s programme which supports PGRs engaged in activities which support teaching and learning?**

*Please note that it is now mandatory for PGRs who support teaching and learning to receive appropriate support and guidance before commencing any such activity* [*https://www2.ljmu.ac.uk/eaqs/R128080.htm*](https://www2.ljmu.ac.uk/eaqs/R128080.htm)

*Further information on the programme are available from Rachel Boulter, email* [*R.M.Boulter@ljmu.ac.uk*](mailto:R.M.Boulter@ljmu.ac.uk)

**Yes (attended sessions in November 2017)**

**e. What training or skills development activities would support progress with your research programme over the next 12 months?**

*You should consider both research and generic skills development which would support both your research programme and your future career aspirations. For information regarding the skills and attributes associated with successful researchers you should refer to the UK Vitae Researcher Development Framework* [*https://www2.ljmu.ac.uk/RGSO/training/128301.htm*](https://www2.ljmu.ac.uk/RGSO/training/128301.htm)

***Conference attendance, publication of appropriate research, presentation of work within the faculty – I will present during PhD talks meeting in August and during research group meetings. I am currently, and will continue to be, a faculty PGR representative.***

**PART C – DIRECTOR OF STUDIES COMMENTS**

**C1. General Comments by Director of Studies**

*(to be completed by the DoS once the information in Part B has been discussed with the PGR)*

***Please include a brief assessment of the PGRs overall quality and performance. Where issues have been raised above or targets have not been met please provide a summary of how these will be addressed.***

**C2. Have the PGRs requirements/expectations for training and skill development been discussed and an appropriate development plan been put in place?**

**C3. Are the existing supervisory arrangements for the PGR adequate? –** Choose an item.

**If No please indicate the proposed changes in the supervisory team and the briefly state the reasons for the change.**

*Please note that any such changes must be notified separately to the Doctoral Academy via an Application for Change in Supervisory Arrangements RD9Sup -* [*https://www2.ljmu.ac.uk/RGSO/62172.htm*](https://www2.ljmu.ac.uk/RGSO/62172.htm)

**C4. Has the need for ethical approval been discussed with the PGR and a plan put in place for obtaining ethical approval (if required)?**

**C5. Is the PGR on track to complete their target award within the maximum registration period permitted under the University’s Research Degree Regulations?**

*If not please provide reasons for this.*

**PART D – JOINT DECLARATION**

**We confirm that the above named candidate is still actively engaged on the research programme and that regular contact is being maintained between the supervisory team and the PGR.**

**Frequency of meetings in the last 12 months**

**

**Signed: Dated: 12/06/18**

*(PGR)*

**Signed:       Dated:**

*(Director of Studies)*