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11th November 2012**

Reference for Sara Rydbeck

Dear Colleague,

I understand that Sara Rydbeck is applying for a postdoctoral position in your group. I interacted with Sara during her pre-doctoral years (2005/06) and she has asked me to write a reference for her.

I first came into contact with Sara when I was doing postdoctoral research in Stockholm, I volunteered to teach cosmology and Sara was one of my students. Despite the fact that she was in a rather quiet class (as classes tend to be in Sweden) she stood out as a capable student who was fully on top of the material and even made contributions and asked questions. After she had finished this course and obtained a good mark, I found myself second examiner on a project she was doing which involved a presentation. The subject of the presentation was the path integral formulation of quantum mechanics and I remember being impressed by the way that Sara had elegantly understood the idea in a very simple but complete way.

I subsequently agreed to take Sara on as a student to do her final undergraduate thesis with me. At the time, there was a lot of work being done on modified gravity as an alternative to dark energy and we decided to look at some Lagrangians like that. I wasn't really sure how well Sara would do since I knew that at the time she hadn't done a great deal of General Relativity, however I have to say I was really presently surprised. Sara took the equations and the relevant papers and diligently worked out what was going on. She performed conformal transformations and calculated the same quantities in the Einstein and the matter frame to ensure she had got the right answer.

Having done all the analytical work, she came up with a system of equations that had to be solved numerically, and again I was very impressed by the way she threw herself into this task. Sara wrote Fortran code to solve the equations and make links between the parameters in the Lagrangian and Observational quantities such as the density of baryons and the density of matter. Her hard work meant that we were able to publish a paper together in a relatively short period of time. She demonstrated good skills in communication, teamwork and presented an enthusiastic and open attitude.

It was for that reason that I continued to work with her at the start of her thesis even though I had left the country and wrote another paper with her and Ariel Goobar which was an analysis of some new data which had come out, comparing it to certain DGP inspired models. This gave Sara the opportunity to become more familiar with statistics, in particular the basics of chi-squared fitting. We were also careful in that paper to identify when we were

talking about Gaussian errors and when we were talking about systematic errors – this was necessary because of the strange way that some supernova systematic errors are calculated. Sara followed this debate and I like to think learnt a lot about statistics in the process.

Altogether she was an extremely efficient and helpful collaborator and it was really a genuine shame that I was not able to work with her more, I would have loved to have had Sara as my first PhD student. I left Sweden soon afterwards and was not able to continue the collaboration.

Since then I know that she has been working a lot more on collider phenomenology and has been working on SUSY and dark matter at the LHC. She has been part of an active group in Stockholm and now DESY. She hasn't published as many papers as one would expect during her first postdoc. I don't know what is going on there; other referees who have interacted more recently than I will be better placed to comment on that.

With regards to her personality I am happy to report that she is very pleasant and always good to be around.

If you would like to call me and chat about specific questions, please do not hesitate to get in contact either on the number above or on my mobile, +44(0)7908663182.

Yours Faithfully,

A handwritten signature in purple ink, appearing to read 'M. D. S. Fairbairn'.

Dr. Malcolm Fairbairn