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Observatorio Astronómico Nacional

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To the evaluation committee,

This is a report on the PhD thesis of Ms. M. Sniegowska as supervised by Professor Bozena Czerny and Dr. Michal Chodorowski.

The thesis comprises an Introduction, three chapters based on published papers and a final Summary and Forthcoming-work chapter. The thesis reflects a large amount of work and is clearly worthy of a PhD degree. Ms. Sniegowska shows clear command on two different areas of astrophysical research (more details below), which is in itself a very good accomplishment. But not only that, in both areas Ms. Sniegowska has made important and innovative contributions to the astrophysics of Active Galactic Nuclei (AGN), which is not commonly seen.

In what follows I will comment on the three articles published by Ms. Sniegowska and will conclude with a few words about those sections of the thesis that do not correspond to published material.

First, I would like to refer to chapters II and III of the thesis, in which Ms. Sniegowska develops possible models to explain the AGN 'Changing Look' (CL) phenomena, which has become one of the most exciting topics of current AGN research. The work of Ms. Sniegowska represents, as clearly stated in the papers, a rather simplistic approach to the possible physical interpretations of the CL behavior, but it clearly opens the door to observers and theoreticians alike to look for possible mechanisms responsible for this new phenomenology, unrecognized to many until very recently. It is in fact the simplicity of the model approach what makes them very easy to be followed by the reader, something that many times is not found in theoretical work. I found this aspect of Ms. Sniegowska's contribution particularly appealing and worth of strong encouragement. Whether her proposed mechanisms are finally identified as taking part in CL systems remains to be tested, but the work clearly paves the road to further research in the area.

Section IV of the thesis corresponds to a completely different subject, and one that requires very strong command of data-driven work as well as a very strong understanding of the physics of AGN. This last paper, on the determination of metallicities of the nuclear region of these systems, is the most complex of all, given the breadth

of knowledge and skills that are required to successfully carry out such research work. In fact, the level of complexity of this subject makes it a bit of niche area of research, but one that is intimately linked to the way AGN physics impacts its surrounding environment and host galaxy. Ms. Sniegowska shows in her article the required level of understanding and knowledge to make an original contribution to this subject and her work is well motivated, well structured, clear in its methodology and significant in its contribution.

In all, I consider the three paper contributions of Ms. Sniegowska to represent an example of a PhD thesis of excellent level.

Finally, I can refer to chapters I and V, the Introduction and Summary and Forthcoming-work sections of the thesis. In particular, the Introduction makes the effort to convey a comprehensive and synoptic view of AGN phenomenology. This is not an easy task as AGN physics is a diverse and complex subject and it has been an active area of research for more than 60 years. Ms. Sniegowska nicely accomplishes this task, something that can feel rather daunting even to senior researchers, and she manages to do it citing historic works on the subject as well as the more modern and recent contributions. Even though I found a few statements of the Introduction somewhat confusing, and some typos and English grammatical problems are also detected, these are few and do not rest value to Ms. Sniegowska great work.

The Summary and Forthcoming-work section of the thesis gives a brief overview of all the work done, but more importantly, shows what are the avenues that Ms. Sniegowska would like to explore next, which I am in no doubt that she will be able to carry out as a young researcher.

Summing up, I consider the doctoral thesis of Ms. M. Sniegowska to be a valuable contribution and to meet the criteria prescribed by the law for a doctoral dissertation. Therefore, I request that this dissertation be admitted to a public defense.

Regards,



Dr. Paulina Lira  
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