Review Form 1.6

Journal Name:	**International Astronomy and Astrophysics Research Journal**
Manuscript Number:	**Ms_IAARJ_85074**
Title of the Manuscript:	**One-dimensional mass and the sisterhood of habitable planets**
Type of the Article	

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty'**, provided the manuscript is scientifically robust and technically sound.
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PART 1: **Review Comments**

	Reviewer's comment	**Author's comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Compulsory REVISION comments	***Brief Summary*** This work deals with the conversion of dark matter into ordinary matter. The aim is to show that when the principal mass is similar to that of the Sun, this conversion may create a terrestrial planet which has a planetary temperature suitable for the greenhouse effect. To this purpose the author investigates several aspects ranging from the existence and the nature of the dark matter, the energy balance for the Universe, to the observed luminosity/mass relation. However, in my opinion, some points need to be clarified. Let us proceed step by step. **CRc1)** ***About the existence of the dark matter*** It is a matter of fact that we are still far away from full understanding of these dark components of the Universe. Experiments trying to detect the dark matter particles continue but still without any positive result. indeed, planets, stars, nebulas, and so on, only makes up about 15% of the matter in the universe. The other 85% of matter (the "*dark matter*") is missing. We know dark matter exists only because all the matter that we actually can see can't explain the motion of stars and galaxies in the universe. Not even close. However, no one knows what dark matter is or how to detect it. The race is on to find it. The author is asked to mention this aspect. **CRc2)** Equation (4), providing the azimuthal orbital velocity, needs further clarifications. According to the author, the second contribution of the r.h.s. of this equation refers to the potential energy due to the 1-D mass of the other bodies. This term contains a relativistic contribution in contrast of the first term on the r.h.s. of the same equation that exhibits a pure classical contribution. The author is asked to clarify this issue **CRc3)** ***The energy balance for the Universe*** Equation (4) shows that for the finite Universe, the azimuthal orbital velocity reaches a minimum at R_c, which is stationary if R_0 is kept constant. However, we know that Universe is constantly expanding. We may object that this may affect the author's conclusions coming from Eq. (9). Author is asked to dispel this possible objection. **CRc4)** Finding dark matter would just be the beginning. Most of the universe is made of dark energy. We think that the *ordinary matter* (OM) is present only at the 4,9% and the *dark matter* (DM) at 26,8%. *Dark energy* (DE) is even more mysterious than dark matter. If you look at all the energy in the universe, it makes up 68.3%. Physicists have no idea what it is, but are thinking of ways to find out. A quick numerical evaluation of the expressions obtained by using the model proposed by the author does not seem to confirm the percentages mentioned above. For completeness, using his model, the author is asked to show the aforementioned percentages providing, as far as possible, a physical interpretation of the strong disparity of these percentages i.e., OM/DE ~ 0,07 and DE/DE ~ 0,39. **CRc5)** ***To detect dark matter by catching it bumping into visible matter*** Section 6. deals with the observed luminosity/mass relation. This relation is provided by Eq. (13). However, the author did not discuss the very important aspect concerning the detection of dark matter by catching it bumping into visible matter. As known, LUX scientists are trying to detect dark matter by visible matter. However, even if dark matter and visible matter regularly bump into each other, the interaction is probably very fleeting and easy to miss. For completeness, the author is asked to comment on this aspect in relation to his model to determine possible "*candidate planets*". **CRc6)** ***Dark matter composed of axions*** Another topic that in my opinion cannot be overlooked is the fact that there are several research groups that propose that dark matter is composed of *axions*, a hypothetical fundamental particle that we have not discovered. That is what some physicists are trying to do with the Axion Dark Matter Experiment (ADMX). Physicists think axions decay into light particles, and though they probably pass through most matter undetected, they might interact with a magnetic field. So ADMX scientists are using a giant superconducting magnet with a microwave cavity inside to try and catch axions. What is the author's opinion about this? More precisely, if their existence is proved, how can the existence of axions be reconciled with the model proposed by the	CRc1) About the existence of dark matter In Section 11 (i), the final sentence has been extended to cite references on the search for dark matter particles, and attention is drawn to the parallel between the 3- D search for particles which occurred long after the bulk properties of mass were well understood. CRc2) The derivation of Eq. (4) is given in Ref [1] where the intermediate Eq. (15) states that the velocity of light (c) is the azimuthal velocity at the radial extent of the Universe (R_o). This is the relativistic connection. CRc3) The energy balance for the Universe Eq.(7), from which (9) follows, is independent of R_o . CRc4) The approximate agreement between the theoretical predictions in the ms. and observations is stated in Ref [1]. In particular Eq. (38) predicts that the ratio of the mass of ordinary matt to the mass of dark matter in the present Universe is17.5 % in good agreement with the estimate based on critical density of 18%, and Eq. (41) predicts that the mass – energy ratio of dark energy to potential energy is 66.7% in good agreement with the observed estimate of 68.3%. A sentence on how this latter ratio was obtained, has been added at the end of Section 3 CRc5) To detect dark matter by catching it bumping into visible matter This interesting comment is discussed quantitatively in Section 4 of Ref [1] and is mentioned in respect to candidate planets in Section 6. CRc6) Dark matter composed of axions This important work is discussed in Section 11(i), with a reference to the search for particles of dark matter being at an early stage. MRc1) and MRc2) An important new section (Section 4) has been included in the ms. which addresses in a general manner these comments, although remaining agnostic, as stated in Section 12, on possible new experimental findings. MRc3) The reference list has been extended to refer generally to the results of current research programmes.

	author given that the author's model does not foresee any new fundamental particle?	
Minor REVISION comments	*The following suggestions are intended to help the author to obtain a manuscript able of attracting more readers while increasing the soundness of his work.* **MRc1)** The introduction does not exhaustively mention the state of the art in this research field. The author should cite, at least briefly, the main lines of research and the most significant works in this area. As an example, I quote - the experiment, called Cryogenic Dark Matter Search (CDMS), which uses an interesting approach to search for dark matter; -The Axion dark matter experiment (ADMX). ADMX is a giant superconducting magnet with a microwave cavity inside used to try to capture axions; - The Large Underground Xenon (LUX) experiment. LUX researchers regularly flood a giant underground reservoir with liquid xenon at a temperature of around -148 degrees Fahrenheit. **MRc2)** The author's work should be more framed in the context of works that have recently appeared in the literature and / or are currently in progress. **MRc3)** In light of the above, the reference list should be completed.	
Optional/General comments	The work is interesting and I enjoyed reading it. However, as can be seen from the comments, there are several gaps that need to be filled. The author is encouraged to take my suggestions into account.	

PART 2:

	Reviewer's comment	**Author's comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Are there ethical issues in this manuscript?	*(If yes, Kindly please write down the ethical issues here in details)*	