

Research Article

Cite this article: Chon Torres OA (2020). Astrobiology and its influence on the renewal of the way we see the world from the teloempathic, educational and astrotheological perspective. *International Journal of Astrobiology* 1–5. <https://doi.org/10.1017/S1473550420000087>

Received: 18 January 2020
Revised: 22 April 2020
Accepted: 28 April 2020

Key words:
Astroethics; astrobiology; astrotheology;
education; teloempathy

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Astrobiology and its influence on the renewal of the way we see the world from the teloempathic, educational and astrotheological perspective

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Abstract

There is a record of the positive effects of astrobiological research for the natural sciences and eventually for their technological use on Earth. However, on the philosophical effects, this is not as visible as the other sciences, which is why it can be assumed that it is a waste of time speculating on astroethics or also on the philosophy of astrobiology. This is the reason why this work seeks to identify and sustain the philosophical utility of astroethics. To achieve this, this article focuses on three essential aspects: teloempathy, education and astrotheology. Russell's argument about the value of philosophy will be used as a fundamental basis for the usefulness of astroethics.

Astrobiology studies the possibility of life in other worlds, but also the possibility that we can extend ourselves over the universe. However, especially astroethics does not neglect essential moral aspects that have to do with life on our planet. The complexity of this discipline is not only limited to looking outwards, but also attends to the possibilities of study that we have on Earth in order to understand how life evolves and, therefore, how it could evolve on other planets. Astroethics, being a specialized branch of astrobiology and philosophy (since ethics is a discipline of the latter) (Chon-Torres, 2018c), could also occupy itself and address issues related to the care we should have not only if we find life in other worlds, but also about caring for the only planet on which we have evidence of life, the Earth.

It is false to think that astrobiology or astroethics do not address or neglect issues related to what happens in our environment. Astroethics would have no reason to exist if it neglected life on Earth only to place greater emphasis on our expansion in the universe. And it would not make sense because if we cannot respect what we have on this planet, this *modus operandi* will eventually repeat itself if we do not learn from our mistakes. The problem does not come from technology, but from how our actions are directed by our theoretical frames of reference, whether from political or economic interests, for example.

Both astrobiology and its sub-discipline, astroethics, have transdisciplinary properties (Chon-Torres, 2018a) because they are capable of crossing disciplines and organizing them in an ethical framework that makes possible action measures necessary to do something positive. So, if we are talking about establishing some kind of ethical principles derived from astrobiology, one of them would be to take care of the life on our planet. To neglect it, would be to have a false morality since it would not be consistent to watch over extraterrestrial life if with it we do not revalue life on Earth. With this one, we could discard a belief based on thinking that there are more important things before seeking life in other worlds ignoring life on Earth.

We have a moral obligation to be the guardians of life in the universe, not only because studying it helps us to understand its possible evolution or conditions of existence elsewhere, but also because after all, it is where thousands of species with whom we share a home live. Astroethics has within it the concept of teloempathy (Cockell, 2005a, 2005b, Cockell *et al.*, 2011), which basically is to have respect for all forms of life that have interests – such as avoiding pain –, whether terrestrial or extraterrestrial and also to protect the environments through which these forms of life can prosper, their ecosystem. This planetary-ethical sense is essential for astrobiology since here it can be connected with ecological ethics and take it to an interplanetary level.

In addition, not only the empathic biological aspect is important, but also the educational one, since astrobiology allows us to connect different knowledge from different disciplines, which makes it rich for the training of future researchers and also trains us to connect ideas and scenarios in the face of new challenges. And we can go further, the astrobiological contribution also anticipates a worldwide change in our own beliefs about the divine in the universe, our beliefs about God and the spiritual. It may allow us an opening that has already begun with, for example, astrotheology, which will be discussed in this paper.

In this respect, the present investigation will be divided into three parts. First, the concept of *teloempathy* will be treated as a connection between ecological ethics and astrobiological ethics. Secondly, the importance and positive influence of astrobiology as a transdisciplinary way of working will be addressed, even coinciding with the objectives set for Sustainable Development by 2030 and with the United Nations for Education. Thirdly, the astrotheological theme will be developed because it is of importance for a large part of the population and also because it represents a way of seeing the religious world that can be compromised in a positive or negative way. These three axes have been chosen because they reflect the human side, the educational side and the spiritual side in astrobiology. Through the search for life in other worlds or our expansion in it, allows us to grow by rethinking our traditional ideas. In other words, it is not a play on words, but a potential change in the mind of those who enter astrobiology itself.

Teloempathy as a form of extended ecological ethics

Teloempathy is a concept developed by Charles Cockell, in which he tells us that we must have respect for life, no matter where it comes from. That is, just as we take care of life on Earth, this care must extend to extraterrestrial life forms. Why should we take care of the life that is not from this planet? We could argue about different proposals. After all, ethics is a branch of philosophy and has no definite answers, otherwise, it would be a science. What we have in ethics are proposals and the one that prevails in the discussion will be the one that contains the best arguments from a discussion.

In this case, we could say that being the guardians of life in the universe (at least the known, observable universe, as far as we know), we are responsible for taking care of life in any of its forms (Chon-Torres, 2019a, 2019b). We should then have a contingency plan, but it does not take away the fact that they have value for themselves. Although these other life forms have emerged from a Second Genesis (McKay, 1990, 2009). It is important to note that they are part of a unique event in the universe, which is the emergence of life itself. It is not just about the life of this planet or another, but the cosmic phenomenon we call life must be treated with a particular form of care.

Astrobioethics, in this sense, can also be understood as a form of extended ecological ethics. In this particular case, the emphasis is given by the presence of life in other worlds. What does that have to do with ecological ethics? Well, a lot, since with astro-bioethics our possibilities are broadened, that is, not only do we contemplate the care of one single planet, but we also extend this intention to other environments. For this reason, in the exercise of concern about an 'interplanetary ecology' arises the proposal of the ethics of planetary sustainability, in which *teloeempathy* can play an important part in all this.

For example, can space mining really present a solution for pressing resource shortages on Earth? Or is it simply nothing but a temporary delay of the problems?. Can the idea of sustainability be applied on human space activities this way? The increasing human use of space certainly demands reflection on its application on our space environment (Losch, 2019).

Our human activity on planet Earth itself has not had the right consequences, we are currently experiencing the climate change generated in part by us. The fact of looking at other planetary environments makes us rethink not only will we continue our way of doing things that in our case has tended towards the

destruction of ecosystems, but now could put at risk the presence of extraterrestrial life.

Of course, in the current state of the question, we have no evidence that life exists in other worlds, but that is no impediment to exercising critical thinking. If we ask ourselves, for example, if a company manages to carry out space mining and by chance exterminates an extremophilic way of life in some celestial body, is there any kind of penalty for that company? The ethical problem is valid at this point, it comes back to the question of should we do everything we can? Obviously not, but it is not about banning completely either. The ways and forms must be adequate to be able to exercise some kind of space mining (Chon-Torres, 2018c). Astrobiology does not escape, then, from the need to frame it within sustainability and responsibility, in this case, interplanetary.

How does astrobioethics, then, help us in this aspect to have more moral awareness in ourselves regarding terrestrial ecology? To the extent that we must be careful with astrobiological exploration, it is imperative to reformulate the theoretical ethical framework that we already have with terrestrial life. As human beings, it makes us think that we cannot repeat the same mistakes because they will not only compromise scientific interests (such as studying other forms of extraterrestrial life) but will also put at risk the only opportunity to know the life forms with which we share this small space of the universe. The fact of reflecting and thinking about our ethics outside the planet makes us reformulate and rethink our work in the world in which we live.

The emphasis on astrobiological ethics does not make us neglect the care of life on Earth; on the contrary, it makes us more aware of how important life is and forces us to take more care of all the forms of life that exist. The human being – to date – is the only one who has the rational capacity and capacity to transform his/her environment, his/her responsibility is twofold not only because he/she must watch over life on Earth, but also over the possible forms of life in the universe and that is his guardianship.

Reinforcement of the approach sought by Unesco in astrobiology

Astrobiology has a particular disciplinary nature. It is transdisciplinary, interconnect different scientific disciplines (Chon-Torres, 2018b), which makes possible a complex vision of the world, if we understand by complex the quality of interrelating phenomena. In the educational approach proposed by the United Nations Educational, Scientific and Cultural Organization (Unesco), for example, we read in its report *Current Challenges for Science Basic Education*:

From the perspective of science, students should develop key ideas and understand their interconnectedness, such as the relationship between the macro and micro-structures of materials and their properties, the concept of energy, ideas about cells and interdependence in biological systems (United Nations Educational, Scientific and Cultural Organization, 2010).

This idea of interconnectivity is also seen in the symposium of transdisciplinarity promoted by the same organization, where we see that:

From a conceptual point of view, transdisciplinarity can be seen as a theoretical attempt to 'transcend disciplines' and, by that, to react against hyperspecialization – a process leading to a dramatically growing fragmentation of knowledge – while at the same time maintaining the advantages of creativity and

initiative peculiar to each specific field of knowledge (United Nations Educational, Scientific and Cultural Organization, 2010).

And this is still true today when we look at the Agenda 2030 for Sustainable Development, Unesco insists on the importance of transdisciplinarity as a theoretical framework for achieving its objectives. The relevance of this way of approaching things generates innovative work scenarios of vital importance: A transdisciplinary approach is a key component of sustainability science. Transdisciplinary research acts as a driver for sustainable innovations in society. The solution to global problems requires radical transformations of the society (United Nations Educational, Scientific and Cultural Organization, 2019).

The problems of today's society are not isolated objects of study, but imply a connection that goes beyond what we can learn in a classroom, where a specialist approach is usually promoted, which is not negative, but not enough. Attempting to solve complex problems in a piecemeal way could lead to a worsening of the situation, which is why Unesco is advocating transdisciplinarity. How is astrobiology included in this context? Astrobiology helps us to understand the world around us through a transdisciplinary view of the possibility of life in the universe.

For example, see NASA's astrobiology roadmap: Astrobiology is multidisciplinary in its content and interdisciplinary in its execution. Its success depends critically upon the close coordination of diverse scientific disciplines and programs, including space missions (Des Marais *et al.*, 2008). Astrobiology represents a challenge for researchers themselves accustomed to the traditional approaches of their disciplines. According to the Astrobiology Strategy: notably, these types of challenges are common to all interdisciplinary research. Research that mixes traditional disciplines often viewed as failing to adhere to the standards of those disciplines by their practitioners. This tendency requires at least a subset of the astrobiology community to be intentional in its approach to overcoming these barriers when input is required from multiple disciplines (Hays, 2015).

This trend in the educational contribution of astrobiology can also be seen here:

Astrobiology is remarkable in its extreme breadth and therefore it is potential for multidisciplinary education and research. It touches on virtually all fields of science and engineering. As a result, it is perhaps unique among all disciplines. Astrobiology is unlike, for instance, biology which is exclusively centred on the study of all aspects of life on Earth (Staley, 2003).

Astrobiology's contribution to human knowledge teaches us that it is essential to be able to interconnect human knowledge in order to have a greater scope about life in the universe. With astrobiology we have an expansion of our concepts and theoretical horizons that helps us to understand ourselves, because the epistemological framework that is used in astrobiology can be extrapolated to, for example, the objectives of Unesco towards 2030 help us to reach them.

From what we see, astrobiology has the capacity to promote transdisciplinary approaches that are not only important for understanding life in general, but also for dealing with complex problems. The contributions of astrobiology should not only be seen as opportunities for technological, but also human and social development.

Astrobiology fits perfectly well to this scenario: it is a relatively new-born transdisciplinary field (in its modern formulation) and it carries, among its core propositions, the dynamism and the intention of pointing to broad questions demanding multiple talents. It is not just a tool to unite researchers or a fashionable

label to obtain research grants, but a new kind of emerging science, in which the whole is greater than the sum of its parts (Santos *et al.*, 2016).

This definition is interesting from an epistemological point of view as well, since astrobiology does not seek to unify methodologies or disciplines, which would be impossible due to the innate differences of each science. On the contrary, it is a process that seeks interaction between the different disciplines that make it up, not with the intention of inventing new names to gain funding, but to really study world phenomena that require a transdisciplinary treatment, which coincides with what has been stated by Unesco.

Now, it is possible that astrobiology may emerge strongly in this context due to the conjuncture and need to consider these types of approaches that may help education, but this does not take away its value to give us a renewed look at the world, where disciplines in isolation cannot give us light. Thus, the importance of astrobiology as a *modus operandi* is valuable.

Training in astrobiology at the university level is of particular importance because astrobiology provides fundamental and intriguing research questions for students and early-stage researchers, questions that cannot be tackled by anyone discipline alone. Multidisciplinary and interdisciplinary training is therefore important to educate researchers capable of working on these issues (Dunér *et al.*, 2018).

Opportunities for growth in knowledge are expanding not only for the natural sciences but also for the social sciences. Transdisciplinarity goes beyond the approaches to which we are traditionally accustomed in university education in general, when we are trained to emphasize certain areas of knowledge and the connection that we can work with other areas of knowledge is not always highlighted. This point is important in order to generate the conditions of possibility that Unesco promotes with a view to 2030. Furthermore, 'Astrobiology's unique, multidisciplinary nature helps the discipline branch into many different social and political topics (climate change, the nature of our place in the Universe, etc.)' (Barge *et al.*, 2013). As indicated, social and political topics also play an important role in the work of astrobiology. It is interesting that climate change is also pointed out, coinciding with the proposal of this paper in which it is understood that astroethics themes have a scope for pondering and planetary self-awareness.

It is in this sense that the importance of astrobiology must be appreciated at a level of social sciences, as well as at a level of natural sciences we have technological contributions of space sciences for the fight against climate change. Similarly, astrobiology and astroethics have contributions to give in order to ponder on the fact that it is not a question of giving importance only to problems that have nothing to do with our world, but on the contrary, by expanding our conceptual and reflective horizons, we also expand the local ones and this allows us to have a renewed look at the crisis we are experiencing on our own planet.

Extended reflections on astrotheology that make us rethink the divine in the universe

In the astrobiological problem within the humanities, we also have the astrotheological discussion, which should not be overlooked considering a large number of believers, both scientific and non-scientific, that currently exist. The process of change that religion had as an institution through astrobiology could be traced from the Copernican revolution, through the principle of

mediocrity. In this, there is nothing special on our planet because it is one of several, so our place in the universe ceases to be such. Currently, this change is already becoming more self-conscious and explicit through so-called astrotheology, where deifical problems derived from astrobiological research are treated with greater freedom and even ideas are developed despite not having empirical evidence of other forms of life in the universe. This only means that the process of changing from a local theological vision to a universal one has already begun and is ready to make its massive appearance once the findings of life outside the Earth are confirmed. The difference with the Copernican twist is that the discovery of life in other worlds may never happen in astrobiology, as Losch (2016) comments.

But what is astrotheology? The word astrotheology is created by researcher Ted Peters, where it is defined as:

Astrotheology is that branch of theology that provides a critical analysis of the contemporary space sciences combined with an explanation of classic doctrines such as creation and Christology for the purpose of constructing a comprehensive and meaningful understanding of our human situation within an astonishingly immense cosmos (Peters, 2014).

Initially, one might think that it is an unnecessary word, since with theology we would have enough. However, the same has been said for astrobiology. If it were true, science would never have been able to advance and expand its concepts and definitions, it would have remained with the same definitions that, for example, Aristotle would have given more than 2000 years ago. It would be like saying that the science of a paradigm should not be subjected to conditions to which it was not initially thought, but science and human knowledge in general do not work like that, but they change, evolve and renew themselves before the new scenarios that we are living and researching.

Peters (2014) defines four important objectives in astrotheology, which are: astrotheologists, which includes people of different faiths, should discuss the problems of geocentrism; astrotheologists should define the parameters of the discussion of Christology and soteriology (Christ's work); astrotheologists should criticize and examine astrobiology from within, exposing the extra-scientific and erroneous assumptions about the theological aspect and the search for life in other worlds; theologians of different religions should meet and evaluate the impact of a possible discovery of extraterrestrial life.

Of the four objectives that the author proposes to us, we can rescue, if we want to be as universal as possible, those that highlight the collaboration between different religions. I believe that astrotheology has great potential when it opens up to other religions, such as Buddhism or Hinduism. Many beliefs would not cease to exist, but some would rather be reinforced by confirming that creation or that which is divine manifests itself in multiple ways as initially thought. Or as Crowe (2008) points out, 'It is sometimes suggested that the discovery of extraterrestrial life would cause great consternation in religious denominations. The reality is that some denominations would view such a discovery not as a disruption of their beliefs, but rather as a confirmation'.

Astrotheology has to be considered as the renewed analysis of classical religious concepts in an astrobiological and contemporary context, as in Christianity for example (Arnould, 2018), considering the vastness of the discoveries about life in the universe. Space is considered our final frontier, but it expands as we investigate it and the speed with which it occurs makes it difficult for us to give meaning to everything we discover. Astrotheology should motivate us to expand and rethink our concepts about

the divine in a cosmic context and not just to give some superficial modifications to the beliefs we already have (Pryor, 2018).

'If one of the first tasks of contemporary astrotheology is to make the case that it is creative, and not merely reactive' (Pryor, 2018). If astrotheology were reactive, it would respond only to new situations with the same qualities and concepts already in use today. On the other hand, being creative, we face new scenarios and find ourselves with the need to adapt or modify part of our belief system in order to make it compatible with the potential offered by the search for life in other worlds. The contribution is greater when we anticipate and work on concepts that can expand our understanding of the divine in an expanded context, in an astrobiological context.

Understanding astro- as an amplicative prefix, we should expect to see (and are seeing) all sorts of new fields arise. These are not merely subdivisions of the hard sciences, like astrophysics, astrochemistry and astrobiology, but also fields imagining the wider social implications of space research, such as astrosociology, astroethics, astroanthropology, astroeconomics, etc. (Pryor, 2018). And in this particular case, it expands into astrotheology.

On the other hand, Pryor (2018) comments that the search for life in other worlds is not based on one centred on an individual, but on the set of beings that interact with each other as a whole.

This idea connects with the intra-action of Barad (2007), considering that living systems and their habitability function as a great whole and should not be thought of separately. In the same way, in astrotheology, the individual should not be counted separately from the cosmos, but in interaction with it in order to give it meaning. We can understand this if we consider that the sense and meaning we give to things do not depend on separating the objects we analyse, but on connecting and gathering them to give them a sense oriented to a totality, which is what a religare (and hence the word religion) finally does.

Thus, if we look at this redefinition of the presence of life that we have attended, we could say that the discovery of life in other worlds according to these criteria can make us rethink the way our society based on the individualistic liberalist model works.

An astrotheology that takes astrobiology seriously cannot simply play out the classically assumed understanding of modern liberal individualism in the widened context of the cosmos. Instead, an astrotheology must give a meaningful account of our human situation in relation to the divine that gives credence to the abductive and amplicative effect that astrobiology has on our study of living systems (Pryor, 2018).

And, in this sense, astrotheology would also point to a point of view that reinforces an ecological ethic, coinciding with the number one point of this work on teloeopathy as an expansion of environmental ethics. Moreover, by considering a broad context not only in terms of life but also astrotheological, it can reinforce an interconnected view of things. Thus, as we see it, astrobiology reinforces the disciplinary interconnectivity important for understanding the challenges of our world. When we see the stars, we expand into the universe, not in a material way, but in a conceptual way and in ideas.

Conclusions

- (1) Teloeopathy considers the respect and care of life independent of its planetary origin. In this sense, teloeopathy is found in astrobioethics, since the latter defines the human being as the guardian of life in the universe. At the same time, teloeopathy could be considered as a kind of extension of an interplanetary ecological ethic. Thus, the aims of astrobiology –

the search for life on other planets – does not rule out the fact of being interested and concerned about life on Earth, quite the contrary, generates a commitment of the researcher with the own forms of life on his planet and those he may know in the search for life in the universe.

- (2) The promotion of the transdisciplinary approach to education through astrobiology can be a great help in achieving the goals of the United Nations Sustainable Development by 2030. Becoming familiar with the astrobiological way of working also brings us closer to a way of proceeding that is distinguished from other disciplines, since the interdependence that is needed in order to move forward is crucial. It is not enough to have just one specialist, but the interaction of work teams is required to broaden the conceptual horizon that we need for astrobiology. This makes us connect scenarios, ideas and face challenges that were not visible before due to the traditional specialization of knowledge. In today's world, this type of approach coincides with that sought in education, as indicated by the United Nations, so in this sense, the feedback from astrobiology to education is highly positive.
- (3) Astrotheology emerges as a contribution derived from the study of astrobiology from the humanities. The idea that religious beliefs or beliefs about the divine can expand into a cosmic realm makes us rethink our concepts about creation and should not only be limited to an extension of traditional ideas but must involve a renewal. This perspective opens up a new landscape in which religious or spiritual beliefs are not going to disappear, but are more likely to adapt. Considering that religion is a generator of meaning – applying to its characteristic 'religare' –, the human being, in his faith, will seek an explanation from his own beliefs and this applies not only to those who exercise an institutionalized religion but also to those who practice personal forms of faith.

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