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From the origins to life elsewhere: Anthropocentric mediatizations on the origins of life and the habitability of exoplanets[1]

Das origens à vida em outros lugares: Mediatizações antropocêntricas sobre as origens da vida e a habitabilidade de exoplanetas

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1. Introduction

The media have always addressed a wide variety of scientific questions, sometimes complex and still unanswered today, notably those relating to our origins and our place in the universe. Among these topics, two stand out particularly due to the competition between scientific teams funded by governments and commercial enterprises: the origin of life on Earth and the potential habitability of exoplanets. These areas are not only major axes of scientific research but also subjects that captivate the public's imagination, raising questions about the beginnings of life and the possibility of finding life forms beyond our solar system. This study explores how the media, particularly audiovisual documentaries, frame and direct public understanding of these complex topics. The results of this research were presented at the Midiaticom 2024 symposium. The main objective of this study is to understand certain mediatization strategies used by the media in the communication of scientific knowledge.

"Mediatization, beyond mediation (educational, cultural, and scientific), involves the broad dissemination of content to diverse audiences. It is constrained by the economic

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and political models of the media and affects public perceptions and knowledge. A critical perspective is therefore necessary: “Mediatization consists of the media representation of individuals, groups, or institutions through the construction of formalized media products, with a strategic aim, involving collective consumption practices. Generally and diachronically, they are structured within a mediatization process affecting contemporary societies” (Lafon, 2019, p. 163).

Audiovisual media, and particularly documentaries, are especially suited to conveying scientific ideas to a broad audience. These media formats allow highly specialized and complex information to be translated into more accessible and engaging narratives, often through the use of striking visuals and simplified explanations. By analyzing a selection of documentaries on exoplanets and the origins of life, this study aims to uncover certain strategies used by media content creators to address these topics, as well as how these strategies may influence, frame, and limit public perception.

Exoplanets, planets located outside our solar system, represent a particularly active field of research as they could potentially harbor life, making them central to the search for extraterrestrial habitability and thus life beyond Earth. The discovery of these distant worlds raises important questions about the conditions necessary for life and whether such conditions exist elsewhere in the universe. Similarly, the origins of life on Earth remain one of the most elusive topics in science. Despite significant advances in fields like biochemistry and evolutionary biology, the exact mechanisms that led to the emergence of life are still debated. The media play a crucial role in communicating these scientific uncertainties, but also in creating narratives that can sometimes simplify or omit the more nuanced aspects of these complex topics.

By studying the media coverage of exoplanets and the origins of life, the research presented at the Midiaticom 2024 symposium highlights how these major scientific themes are translated into public discourse, revealing certain mediatization techniques such as narrative simplification, the use of dramatic imagery, and the selection of key themes, which frame (Entman, 1993) the issues in a way that may encourage new investments, particularly from GAFAM..

2. From the “origins of life” to “life elsewhere”: Mediatizations of the origins in audiovisual documentaries

Audiovisual documentaries constitute a central format in the field of scientific communication, requiring significant financial, technical, and creative investments. As Yves Jeanneret explains: "there exists a core element, if not of popularization, at least of science communication, with a long historical continuity, linked to the major definitions of the role of science in society, to what I would call the social myth of Science. This core element reflects the persistence of certain textual frameworks and discursive forms" (Jeanneret, 2000).

Most of these documentaries are produced with substantial resources involving international co-productions and are broadcast through well-established channels within major television networks (notably National Geographic). They exhibit specific attributes: a long duration — often exceeding 20 minutes — and multi-broadcasting in several languages on channels in multiple countries, as well as increasingly frequent availability on various platforms, whether free or paid. With the rise of digital consumption, these documentaries are often distributed via open platforms like YouTube or through paid streaming services, allowing them to reach a wide global audience.

The documentaries selected for this study mainly come from YouTube, reflecting a particular focus on content that is easily accessible in multiple languages, specifically French, English, and Spanish. To ensure that the analysis represents widely consumed content on a global scale, the documentaries were sorted based on their number of views, indicating their popularity and potential impact on the public's scientific understanding.

Criteria for documentary selection:

- Long formats ≥ 20 minutes (standard formats: 26, 52, or 90 minutes);
- YouTube search for the most viewed documentaries in three languages: French, English, and Spanish (using proxies) with the keywords "origins of life" in different languages;
- Sorting by descending number of views.

In total, 20 documentaries were selected. This article synthesizes their main aspects. Two-thirds of the documentaries are specifically television productions, rebroadcast on YouTube. The remaining third belongs to new content production strategies: YouTube science popularization channels (Kosmo, Orbinea, History of Earth),

documentaries produced by scientific projects (Hadean Bioscience Project), and Christian activist media (Illustra Media).

The recurring themes in these documentaries are universal and fundamental subjects, such as the process of evolution in relation to geological eras and mass extinction events. Additionally, many documentaries explore the formation of celestial bodies, particularly Earth and the Moon, shedding light on the physical processes that shaped our planet and its satellite. Beyond these general themes, specific scientific explanations are frequently presented, including the complex biochemical mechanisms underlying life, as well as discussions on the role of chance in these processes, as seen in documentaries from the American YouTube channel Illustra Media.

Despite the wide scientific scope covered in these documentaries, the question of the origins of life is often treated with little depth. Explanations regarding the beginnings of life tend to be elliptical, meaning they are often vague or incomplete, and the narratives are only briefly sketched. For instance, the concept of the "primordial soup," a theory suggesting that life began in a nutrient-rich environment on early Earth, is frequently mentioned but rarely explored in detail. This tendency to gloss over complex topics highlights a broader challenge in scientific communication: the difficulty of making highly specialized and detailed scientific knowledge accessible to the general public, as Sophie Moirand explained: "the time and space constraints of the media leave little room for true explanation, let alone scientific argumentation"; there is indeed an "inherent contradiction in the encounter between science and the media: between the (real or simulated) popularizing project of explaining science and the institutional and technical constraints of media speed, which can only show it" (Moirand, 1997, p. 41).

This difficulty in mediating the origins of life stems from the inherent constraints of the medium itself. While highly specialized scientific media, such as academic journals or niche publications (Hadean Bioscience Project), can afford to provide comprehensive and detailed explanations of these phenomena, mainstream media like television channels or general popularization YouTube channels tend to rely on simplified visual and narrative techniques. These techniques, while effective in capturing the attention of a broader audience, often lead to a trade-off between scientific depth and narrative clarity, resulting in a more superficial presentation of complex scientific ideas.

3. How to engage viewers: performative narratives and investigations

By constructing plots around themes of scientific discovery and exploration, these documentaries craft stories resembling journeys into the unknown, often taking viewers on adventures through time and space. The narrative structure is designed to spark curiosity and wonder, inviting viewers to join a voyage of exploration. Through this method, documentaries become not just educational but immersive experiences, drawing audiences into simulated worlds, reconstructing facts from a narrative perspective borrowed from drama and adventure, making the content both informative and entertaining. The investigations presented to viewers vary in nature and contribute to creating a "sense of wonder" through:

- The construction of a plot: the scientific investigation;
- The construction of an adventure: the spatial and/or temporal journey.

Thus, investigation and journey are central mechanisms in scientific audiovisual documentaries, benefiting from international co-productions and a well-established culture of financing, along with a long tradition of travel and exploration narratives that some historians have studied (Venayre, 2006).

At the heart of this performative narrative approach are also visual techniques. These documentaries transform abstract (molecular) or large-scale scientific events into humanly understandable experiences through special camera effects, dynamic editing, and visual representations. A recurring technique is hyperrealistic production using computer-generated imagery (CGI). By reconstructing landscapes, organisms, and processes, documentaries fund specialized companies that push the boundaries of imaging technology. For instance, a National Geographic documentary produced in 2010 by Pioneer enlisted the expertise of special effects companies (Lumiere VFX & Weave). Over the following decade, artificial intelligence began generating such images (Cani, 2020).

Another common technique is the creation of visualizations of processes in fast-forward (astral movements, tectonic shifts) or in slow motion (molecular processes) to match human perception. These techniques of altering pace allow the audience to understand processes that unfold over millions of years in just a few minutes, creating a

spectacular effect. Similarly, zooming in or out over vast distances, from microscopic cells to entire galaxies, helps bridge the gap between the viewer's daily experience and the vastness of the universe. These effects help to make scientific information both visually stunning and comprehensible by providing viewers with a tangible sense of scale: "Since 'everything in nature is movement, everything is rhythm,' thanks to these two techniques it is possible to 'analyze the most complex movements by adjusting their speed to perceptible speed.' In short, slow motion and fast-forward allow us to transpose the scale of any movement to our own, almost as if there were a mathematical proposition making the most diverse environments visible" (Bernabei, quoting Jean Comandon, 2019, 93).

A striking example of this type of narration is found in the Australian PBS documentary released in 2013, which embodies the performative narrative approach. This documentary takes viewers on a vivid journey through space and time. The journey becomes visually explicit, allowing viewers to feel as though they are physically traveling through different dimensions, with the on-screen scientist narrator using a simulated "time GPS" to visit different geological periods. By employing this immersive narrative strategy, the documentary aims to demystify complex scientific concepts like the Big Bang, galaxy formation, and the evolution of life, while maintaining an adventurous tone. The space-time travel technique is designed to make abstract scientific subjects more concrete and captivating.

In portraying the pursuit of knowledge as an adventure full of mystery and discovery, documentaries humanize the scientific process. They depict scientists not as distant experts but as explorers of the unknown, engaged in a quest to uncover the universe's secrets. Through the use of emotional storytelling, dramatic visuals, and a sense of adventure, scientific documentaries effectively transform learning into an exciting and immersive experience. And while the exploration of the past and the origins of life is a perpetual and mythological quest, the search for life elsewhere is a modern narrative that resonates anew today, with the habitability of exoplanets echoing emerging questions about the degradation of Earth's habitability during this era known as the Anthropocene.

4. From "life elsewhere" to "living elsewhere": Event-driven mediatizations of exoplanets

Another study conducted prior to the one on documentaries about the origins was carried out at the University of Grenoble Alpes and led to the publication of a scientific journal issue. In this issue, it specifically addresses the media coverage of exoplanets (planets located outside our solar system), which have become an increasingly popular topic in scientific discussions and media coverage. Due to its novelty, the media representation of this subject is structured around major events, particularly discovery announcements. Each time astronomers detect a new exoplanet, especially if it is found in the famous "habitable zone," it often garners considerable media attention. These announcements are presented as revolutionary moments in the ongoing quest for extraterrestrial life and in our broader understanding of the universe. The discovery process is often depicted as a monumental breakthrough in space exploration, even though the scientific implications are still far from being fully understood. By focusing on these significant milestones, the media transforms the slow, methodical process of scientific research into a series of thrilling, event-driven stories aimed at capturing the public's attention.

In addition to exoplanets, the media representation of Mars exploration is also marked by events, but more regular and predictable events, with constant updates related to ongoing missions, such as those of the Martian rovers. This variability in the coverage of exoplanets and Martian missions reflects the event-driven nature of science related to space exploration, where each new discovery can significantly alter our understanding of distant solar systems.

One of the most characteristic aspects of the media coverage of exoplanets is the use of metaphors (Jeanneret, 1992), which play a crucial role in how these distant, unknown worlds are communicated to the general public. Exoplanets are most often described using metaphors that create a sense of familiarity and conceptual proximity for an audience that might otherwise struggle to grasp the vast distances and abstract scientific data involved in their study. For instance, exoplanets are frequently referred to as "new Earths" or "Earth’s twins," terms that suggest these planets are closely related to ours and might even be habitable.

In addition to the "new Earth" metaphor, other commonly used metaphors in the media coverage of exoplanets include hunting or farming imagery. For example,

scientists are often said to be "hunting" exoplanets, equating the discovery process to a chase or quest, full of suspense and potential rewards. Alternatively, the process of gathering data on exoplanets is sometimes described as a "harvest" of information, suggesting a slow, methodical accumulation of knowledge, similar to the work of a farmer. These two metaphors—hunting and harvesting—serve to create a narrative structure around the scientific process, presenting it as a journey or task that the public can easily understand and relate to.

All these metaphors generate a sense of excitement and possibility, as they portray the discovery of exoplanets as the identification of potential new homes for humanity. These descriptions foster a connection between the reader or viewer and these distant planets, making them more accessible and comprehensible, despite the fact that they are located light-years away from Earth, thus unattainable.

Thus, to refer to one of the documentaries studied on the question of origins (part 1), a documentary produced by the YouTube channel Kosmo draws a connection in its conclusion with the question of life elsewhere:

"According to some scientists we are now living in the epoch of the sixth mass Extinction event, they also called it The holocene or anthropocene extinction. Thousands of species have died out in the past 10,000 years around 900 species vanished from the face of the Earth in the past 500 years. Today about 40% of amphibian species and 25% of mammal species are under the threat of extinction and it looks like one of the two reasons for this is human activity. The history of life on Earth is still being recorded. The primordial struggle for survival is going on, even at this moment and we cannot say with any certainty what our planet will look like in hundreds of millions of years. Perhaps its surface will be covered with lifeless deserts and humans will refer to another planet as their home. The universe is full of other worlds which are quite out of bounds right now but nevertheless so attractive to humans who have always been keen on seeing beyond The Horizon. So far we have made only the first timid steps in exploring the boundless universe and there are all sorts of countless secrets waiting for us up ahead."

These metaphors not only simplify science; they also encourage the public to envision themselves in these extraterrestrial environments, which are unreachable but presented in a familiar way.

5. How to engage citizens: political issues and proximization in an anthropocene context

The discovery and media coverage of exoplanets are not only scientific milestones but also have significant political ramifications that extend beyond the realm of astronomy. The exploration of distant planets, once considered a purely academic endeavor, is now intertwined with broader political, social, and economic debates. A key aspect of this dynamic is how exoplanets and space exploration are presented as potential solutions to urgent challenges on Earth in the Anthropocene context. A relevant scientific debate on this topic is found in the exchange between sociologist Bruno Latour (Latour, 2008) and political scientist Pierre Favre (Favre, 2008), who explore the politicization of contemporary astronomy. Their debate highlights how the colonization of exoplanets is often portrayed as a visionary solution to Earth's problems, even though the political objectives underlying this narrative are much more complex and nuanced than they might appear.

Latour and Favre argue that the way space exploration, particularly the colonization of exoplanets, is communicated to the public serves (for Latour) – or not yet (for Favre) – political interests. Eve Seguin (Seguin, 2015) revisits this debate and explains that both Latour and Favre make a mistake in considering exoplanets as a political issue due to their real status. For her, the issue is entirely current; it is about shaping public perception in a way that aligns with broader political and economic agendas. The narratives about exoplanets actually serve the economic interests of private actors in the space industry and the states that support them. The challenge is to make these issues relevant to citizens, in other words, to bring these issues closer to home and turn them into very current political and economic questions to justify investments: “The theory 'science is politics by other means' helps to understand why contemporary astronomy, like microbiology, is a political practice. The common mistake of B. Latour and P. Favre is to assume that the colonization of exoplanets will serve as a grand and distant objective: ensuring the survival of the human species after the complete degradation of living conditions on Earth. In reality, the politics of interstellar proximity

that is taking shape is pursuing political goals that have nothing to do with this catastrophe scenario. Probably the most important goal is the abolition of the earthly limit to economic growth" (Seguin, 2015: 299).

The communication around exoplanets and space exploration has undergone a rapid transformation, notably with the rise of private space companies such as SpaceX (Elon Musk) and Blue Origin (Jeff Bezos). These companies have become major players in the field of space exploration; they not only explore space but also shape the way space exploration is perceived by the public. Their media strategies are highly sophisticated, using social media campaigns and high-impact launches to generate excitement around their missions: "The use of space exploits for propaganda purposes is not new for states, but it is clear that communication methods have evolved with the advent of private actors" (Degrange, 2021: 15).

This amplified communication serves multiple objectives: it bolsters public support, attracts investments, and helps these companies position themselves as leaders in the emerging space economy. These communications are not just informative; they are also strategic, designed to generate enthusiasm and create a sense of inevitability around the idea of human colonization of space, in connection with the Anthropocene context. The origins and future of life thus become new essential categories of media narratives in our contemporary societies.

6. Final words

he media coverage of the origins of life and the habitability of exoplanets reveals an anthropocentric instrumentalization of contemporary concerns, showing how human-centered perspectives influence the way these complex scientific topics are communicated. This media portrayal is not purely neutral or objective; it demonstrates how science is often presented in ways that align with human interests and anxieties, particularly regarding our future and survival. Through these lenses, science is staged to engage the public both emotionally and intellectually, shaping collective perceptions of both the natural world and humanity's place within it. The way these topics are depicted in the media—whether through documentaries or news articles—plays a crucial role in constructing compelling, accessible, and sometimes even sensational narratives. These

forms of media coverage use various strategies, such as immersive storytelling, metaphors that create proximity with viewers, and event-focused coverage, to transform abstract scientific concepts into accessible and appealing content that resonates with broader audiences.

Documentaries, in particular, excel at making the origins of life and the habitability of exoplanets more accessible by weaving these scientific subjects into immersive narratives. Through cinematic techniques such as time-lapse imagery, animations, and dramatic reconstructions, they turn complex processes into stories that seem personal and urgent. Similarly, news articles, especially those structured around major discoveries or events, adopt a similar approach by using catchy headlines and accessible language to capture public attention. These articles often highlight specific milestones—such as the discovery of a potentially habitable exoplanet or advances in understanding the origins of life on Earth—drawing the public into the scientific narrative and stimulating discovery and innovation.

However, this process of media coverage is not without challenges and tensions. On one hand, accurate and rigorous scientific communication is necessary to faithfully reflect the complexities and uncertainties inherent in scientific research. On the other hand, media platforms are often constrained by the need to produce simplified, engaging, and visually spectacular content. This tension between scientific accuracy and media sensationalism can sometimes lead to incomplete or biased understanding of the science in question. As Monique Sicard explains: “The more the denial of the vision devices, the transparency of the mediums is manifested on the first level, the more easily the political function of images is exercised on the second” (Sicard, 2020, p. 24).

Similarly, event-focused coverage, while useful for maintaining public interest, can lead to a focus on individual discoveries rather than on the slow and cumulative progression of science, which is often less spectacular but just as important, especially as signs of Anthropocene disorder become increasingly perceptible.

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