

Extraterrestrial Relativism

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ABSTRACT

This paper suggests that today's twin scientific interests in the extreme and extraterrestrial ground a novel kind of relativism, which I call extraterrestrial relativism, a relativism about "nature" over culture—and, more, about Earthly, even cosmic, nature. I develop the concept of extraterrestrial relativism using ethnographic work I conducted among astrobiologists and I suggest that this genre of relativism can be brought into a newly inaugurated conversation on "comparative relativisms" in anthropology. [Keywords: Comparative relativism, extraterrestriality, nature/culture, astrobiology]

Peter Watts's 1999 science fiction novel, *Starfish*, concerns a cadre of humans who have been physiologically engineered to live on the seafloor, near undersea volcanoes, where they do maintenance work for a multinational corporation mining the seabed. Their metabolisms are tuned to the high pressure and exotic chemical mixes of these settings so that they are fit to what, in contemporary scientific terminology, is called an "extreme environment." Partly adapted through technological prostheses, partly through more fleshly modification, these people might be called, after a term popular in recent biology, *extremophiles* ("lovers of extremes").

Robert MacElroy coined the word *extremophile* in 1974 as a hybrid of the Latin *extremus* and the Greek *philos*. The word gathered together organisms—psychrophiles (cold lovers), halophiles (salt lovers), and more—that previously had little to do with one another classificatorily. Prior to 1974, if one spoke of these creatures in the same moment it was in the

realm of food preservation; freezing, salting, drying, pasteurization, and irradiating are all methods of controlling the varied and resilient microbes that live in food. What brought these creatures under the same designation was the notion of the “extreme environment.” While that phrase originated in clinical and personnel psychology and applied psychiatry in the 1960s to discuss communities of humans acting in isolated and intense social settings (Antarctic research stations, spaceships—the science-fiction setting of *Starfish* would fit perfectly), “extreme environment” by the 1970s came also to have a more ecological meaning (see e.g., Moulder 1974; for a supporting account, see Olson 2010:165, note 13). By the 1990s, extreme environments came to embrace extraterrestrial settings, and, in the early 2000s, there emerged the somewhat roomier concept of “extreme nature,” the title of at least two popular science books in the first decade of the century (Curtsinger 2005, Carwardine 2008). In the contemporary moment, then, the “extreme” has become a frame for thinking about nature and its boundaries.

In this paper, I suggest that the shared semiotic terrain of the *extreme* and *extraterrestrial* now grounds a novel kind of relativism, where “relativism” describes a view that takes facts of existence and experience to be relative to conditioning situations, situations that themselves may require a certain suspension of judgment as to their absolute grounding. *Extraterrestrial relativism* is a relativism about “nature” over culture—and, more than this, a relativism about Earthly nature. It extends into the cosmos Eduardo Viveiros de Castro’s (2009) concept of *multinaturalism*, an analytic he uses to describe interpretations of the world as made of creatures who all experience themselves as subjects (even “humans”) while also each summoning forth their own unique embodiment of “nature” (so, if for the Amerindian cases he discusses, “jaguars see blood as manioc beer [and] vultures see maggots in rotting meat as grilled fish” [470]—seeing all “food,” in other words, as properly “cultural”—this encounter is clothed in different “natures” [jaguarness, vultureness] [for an extraterrestrial analog, think of *Star Trek* episodes in which even beings of pure light have “gender”]). Extraterrestrial relativism as multinaturalism would track how different organisms summon different “natures” even as they share the enterprise of being “alive.” But extraterrestrial relativism also has points of difference from Viveiros de Castro’s experiential and phenomenological formulation of the multinatural. In some instantiations, extraterrestrial relativism is a *non-anthropocentric relativism* in which humans (as

well as other creatures, and, at its limits, life itself) may be entirely absent. Such a relativism may evaporate residues of “culture” (as a contingent, symbolic system) that still reside in the very framing of relativism, forcing us not only to speak of comparisons that might be undertaken relative to different natures (cf. Choy 2011 on “ecologies of comparison”), but also, more expansively, to think about whether comparison might always require an agent to enact it.

In what follows, I develop the concept of extraterrestrial relativism by leaping off from ethnographic work I conducted among astrobiologists—scientists who consider Earthly extremophiles as analogs, stand-ins, for possible extraterrestrial life. Along the way, I suggest that extraterrestrial relativism be brought into conversation not only with multinaturalism, but also with a newly inaugurated conversation on “comparative relativism” (see, e.g., Viveiros de Castro 2009, Jensen et al. 2011).

After After Nature

Toward the end of the 20th century, Marilyn Strathern (1992) suggested that more and more people in the contemporary world were living “after nature,” living simultaneously in pursuit of “natural” foundations for social relations as well as “post-nature,” in a time when it had become clear that “nature”—particularly the biological—was a social category and one ever more amenable to cultural transformation. Following Strathern’s cue, many anthropologists in the 1990s and early 2000s studied zones of cultural practice in which such conceptions of “nature” were in the making, from new reproductive technologies, to genetic engineering, to cloning (see, e.g., Hartouni 1997, Rabinow 1999, Franklin and Ragoné 1998, Rapp 2000, Franklin 2007). Indeed, my own *Silicon Second Nature* (2000), an ethnography of Artificial Life, a field devoted to the computer modeling of living systems, concluded that “Artificial Life”—and particularly its key method, simulation—hinted at an undoing of the self-evidence of “life itself” as a natural kind, not least because nature itself had become imitable.

But “extreme nature” may be the new “after nature.” Such certainly seemed plausible to me when I turned my attention from Artificial Life science to examine the work of biologists studying microbes living at deep-sea hydrothermal vents, at extremes of temperature and pressure (Helmreich 2009). Like Artificial Life scientists, these researchers were interested in stretching their concepts of living systems. Extremophiles, like

vent *thermophiles* (heat-lovers), pressed against the boundaries of what microbiologists believed living things could enact and endure. As Carl Wirsén, a microbiologist at the Woods Hole Oceanographic Institution in Massachusetts told me in a 2001 interview, one might sensibly use vent microbes to think about the question “What are the limits of life?” Wirsén’s colleague, Andreas Teske, added that, “microbes have shown us many alternatives for living.” And Mitch Sogin, a microbiologist at the neighboring Marine Biological Laboratory in Woods Hole, told me that many of his colleagues believed that marine extremophiles, like those at vents, might provide possible threads back to aboriginal life forms on Earth, which may themselves have been extremophilic microbes. As head of an astrobiology research group at the Marine Biological Lab, Sogin also suggested that such microbes might be pointers to life on other worlds, in other ecologies, analogs for extraterrestrial life. NASA’s LEXEN (Life in Extreme Environments) project, I learned, was interested in precisely this question. The limits of life, the boundaries of vitality, may yet be unknown. Scientists are still chasing “after nature,” but are now doing so by looking to the stars, for yet-to-be-characterized conditions, yet-to-be-known “extremes” relative to which life might be able to survive.

Extremophilic Relativism

I learned much more about such framings of extremophiles at a 2005 workshop on astrobiology I attended at the Marine Biology Laboratory. One intriguing presentation came from Lynn Rothschild, an astrobiologist from NASA who studies halophiles, salt-loving microbes that can survive extreme desiccation in suspended animation between waterings. With bacteriologist Rocco Mancinelli, she had in 1994 helped design an experiment for the European Space Agency in which halophiles were exposed to the extreme cold and unfiltered solar radiation of space. During a stint on a recoverable satellite these microbes survived for two weeks, a result that Rothschild argued supported the possibility that living things could be transited to Earth from such sites as Mars, if indeed Mars sports such life. That capacity could support the possibility that life originated on Mars and was ferried to Earth on, say, a meteorite. In this experiment, extremophiles become proxy aliens. The *extreme* and the *extraterrestrial* glide rhetorically into one another.

While the word *extremophile* has usually been taken to refer to microbial life forms, Rothschild pointed out that the term can apply to metazoans as well, and, more, that “extremophily” is a relative term. Humans might be imagined as aerophiles—air-lovers: an extreme from the vantage point of anaerobes. The “extreme,” here, functions as a relativist rather than totalizing operator. What this accomplishes is attention to environment; the ends of this kind of biology are about ecological context (itself in constant readjustment). The effect for many scientists in this discussion is further to displace humans as reference points for accounts of evolution and to place the whole conversation in a more cosmic setting (contrast Farman, this issue, on Singularitarians’ vision of the universe as reaching toward a self-consciousness that has humans as a stop along the way; for Singularitarians, a non-relativist “intelligence” displaces “life” as the object about which a cosmic account must be sought). The extreme—that which is outermost from any center or which is opposed to the moderate (OED)—shades into extraterrestrial—that which exists or originates outside Earth. The fusion of extreme and extraterrestrial is also enabled by the scale at which each category operates—a scale that has zooming-out as its signature property and that has comparison built into it. The extreme and the extraterrestrial are also both relational categories, and perhaps relativist, at least in the canonical sense.

Comparative Relativisms

Such an articulation suggests extraterrestrial relativism as a possible data point for discussions of what social science and humanities scholars at a September 2009 meeting at the IT University of Copenhagen termed “comparative relativism” (Jensen et al. 2011). While “comparative relativism” is at first glance an oxymoron (how can relativism, the character of which is predicated on incommensurability, be a stage for comparison?), the question asked by the term becomes clearer if we think about the many uses and flavors of relativist claims. As the Copenhagen conveners put it,

Comparative relativism is understood by some to imply that relativism comes in various kinds and that these have multiple uses, functions, and effects, varying widely in different personal, historical,

and institutional contexts; moreover, that those contexts can be compared and contrasted to good purpose...On the other hand, comparative relativism is taken by other[s] to imply and encourage a “comparison of comparisons,” in order to relativize what different peoples—say, Western academics and Amerindian shamans—compare things “for.” (Jensen et al. 2011)

In other words, comparative relativism can ask both what knowledge or truth is being imagined relative *to* and whether comparison always operates in the “same” way—or with the same grounds or purposes (e.g., shoring up the categories of culture, nature, morality) wherever we find it.

For extraterrestrial relativism, knowledge or truth about “life” (or even its “conditions”) is imagined as relative to a “nature” whose full character we do not yet know, whose outlines may lead us toward comparisons we cannot predict. Take as a recent manifestation the announcement, in December 2010, by geomicrobiologist Felisa Wolfe-Simon, of the possibility that living systems might use arsenic in place of phosphorus in the making of DNA (Wolfe-Simon et al. 2010). Wolfe-Simon and her colleagues isolated a microbe from California’s Mono Lake and cultivated a version in a lab that they believed could live without phosphorus. Wolfe-Simon put the significance of the finding this way: “This is a microbe that has solved the problem of how to live in a different way.” In her reflections on the meaning of her result, she suggested that she was “cracking open the door and finding that what we think are fixed constants of life are not” (as cited in Overbye 2010).¹

Such undoings of fixity, such agnosticisms about the ultimate anchors for life, may themselves go to extremes of meta-relativism. Physicists Alejandro Jenkins and Gilad Perez (2010:42) have argued in *Scientific American* that “Multiple other universes—each with its own laws of physics—may have emerged from the same primordial vacuum that gave rise to ours,” and “may contain intricate structures and perhaps even some forms of life,” suggesting that the cosmos as we know it may not be the only one hospitable to life. Such a framing offers a contrast with many discussions of human spacefaring, which pitch space as inhospitable to life as we know it. (See Battaglia 2012, this issue; Olson 2010 on how space analog missions seek to produce habitability where once there was none. A more extensive comparison of space medicine with astrobiology

would likely reveal further differences in terms of reference.) But astrobiological and astrophysical framings of space as hospitable resonate with some features of *multinaturalism*. Viveiros de Castro (1998:470) draws on his ethnographic work in Amazonia to suggest a way of apprehending the world that is not *multicultural*—“founded on the mutual implication of the unity of nature and the plurality of cultures”—but rather *multinatural*, supposing “a spiritual unity and a corporeal diversity.” For extraterrestrial relativism, a “spiritual unity” can be discerned in scientific faith in the universality of “life” as a category (which may itself be indicative of a wider epistemological moment in which the off-worldly has become a taken-for-granted point of reference [see Battaglia 2005 on this “ET culture.” See also Valentine, Olson, and Battaglia 2009]). If in Viveiros de Castro’s accounting, “jaguars see blood as manioc beer” where human people see blood as blood (as their natural, vital fluid) in an extremophilic relativist accounting, anaerobes may experience, say, air as a toxic pollutant created by plant life, where aerophiles experience it as a nurturing surround.

Of course, such relativism may in some instantiations actually underwrite a deep universalism, even absolutism. Witness in Jenkins and Perez’s (2010) consideration of a multiverse a continued faith in “laws of physics” and “forms of life.” Such trans-universe vitalism in view, it is not surprising that the Vatican has lately taken a keen interest in astrobiology (Pontifical Academy of Sciences 2009). For Vatican thinkers at a November 2009 meeting on astrobiology, the question was not whether God could create life beyond Earth or beyond Earth-like environments—of course He could—but whether humans might learn more about the Creation from knowing about such zones.

But extraterrestrial relativism may also be a tool for more thoroughgoing reframings of life on Earth. Another rhetorical move that an extraterrestrial relativism permits is a folding back toward rethinking Earth “itself” (a theme iterated by Battaglia and by Valentine, this issue). Such bending-backs to think about alternative Earths in these days of environmental crisis tend, however, to unwind relativistic frames, asking humans to think about the uninhabitable Earths that may result from continued human depredation of the planet. In this way, extraterrestrial relativism is recuperated into more normative claims about life on Earth.

Extraterrestrial Earths

At the 2005 meeting on Astrobiology at Woods Hole, Philip Crane, who studies exosolar planets, described worlds that might support life as “other Earths” (see Astronomy and Astrophysics Advisory Committee 2009). The phrase flummoxed many participants, who protested that *our* Earth is the only one there is; “Earth-like planets” might be a better term, they offered. But the framing also suggested its negative image: reimaginings of Earth as other than it is—a kind of speculative extraterrestrial relativism, bent back to respin “Earth.” Interest in the extraterrestrial, after all, always comes with an attitude toward the terrestrial (see Battaglia 2005). Doom-and-gloom Cold War visions had escape from Earth as a necessity for survival in an apocalyptic age in which humanity was considered to be teetering on the brink of nuclear self-immolation (and persists these days in commercial NewSpacers’ motivations for designing “exit strategies” for leaving a ruined Earth [Valentine this issue]). More recent environmentalist attitudes take Earth as the only planet we have, one we must steward and love. The cautionary tales told in both narratives relativize Earth in the service of more absolute moralities.

Let me make a partial inventory of what I call “extraterrestrial Earths.” I offer this historical list to point to the emergence of an extraterrestrial mode of thinking about the planet. After this detour, I return to the question of why an “extraterrestrial relativism” has come into articulation in the contemporary moment, what it might betoken, and how we might understand its limits.

In 1968, Buckminster Fuller, building on the work of economist Kenneth Boulding, suggested that humans think of their planet as Spaceship Earth. The famous Apollo image of Earth from space concretizes that conception, preparing the way for what we now think of as “the globe” (see Garb 1985, Cosgrove 1994, Haraway 1995, McQuirk 1997, Jasanoff 2004, Welter 2011, Lazier 2011, Helmreich 2012). And for many viewers, the image of the Earth from space is not an image of Earth as ground, but an image of *Earth as sea* (famously so pronounced by Arthur C. Clarke: “How inappropriate to call this planet earth when it is quite clearly Ocean” [as cited in Lovelock 1990:102]. And see, e.g., Helmreich 2009:3). This distant vision has been in the aid of a return to intimacy with the planet, what Donna Haraway (1995:174) calls a “yearning for the physical sensuousness of a wet and blue-green Earth.” Lifted above the ocean that Edmund Burke in 1757 named as the signature symbol of the

sublime—that which overwhelms with terror and beauty—we embrace the blue planet as sensual home, as what atmospheric chemist James Lovelock called “Gaia.” Earth not undone, but redone as Ocean. But the ocean also undoes Earth, too—and not only because of the uncanniness of an ocean as at once of us and not of us, but more, because the ocean becomes a metaphor for outer space. The sea of space, the sea of stars, turns Earth into an island—*This Island Earth*, as the 1955 science fiction film had it. But Earth is redone here, once more, for the idea of the island suggests *other* islands and turns the space between into a sea. Think only of the names of spaceships sent to Mars: *Mariner*, *Viking*. Here, astropoetics is astronautics. For scientists who believe, with physicist and astrobiologist Paul Davies, that life-as-we-know-it may have originated as microbial life in an ancient Martian ocean and was then ferried to Earth on meteorites—the claim that Rothschild and Mancinelli sought, in part, to think through—the space between Earth and Mars becomes very much like a sea, with currents, eddies, pulls (Mancinelli et al. 1998). Earth and Mars become islands in an archipelagic ecology, ocean worlds in a larger ocean. Space is not a “lifeless” sea in this imaginary (or, if it is, it is certainly not a space of calm—see Olson this issue—nor, even, perhaps, a “space.” These days, near-Earth space is more like “an environment,” or “ecology” [Olson 2010]).

Mars and Earth have long been locked in relative comparison (see Markley 2005)—Lovelock’s (1990) Gaia hypothesis, which suggested that one could read Earth’s atmosphere as an index of life, was first inspired by his meditation on how one might look for life on Mars by seeking spectrographic traces of organically produced compounds. These days, scientists looking for life on Mars scout for microbes analogous to those archaeobacteria on Earth that live in such sites as deep-sea hydrothermal vents. That project has the ricochet effect of making portions of Earth into analogs for other worlds: turning parts of the Utah desert into Mars (Messeri 2011), parts of the Arctic into Jupiter’s moon, Europa. Submerged in the sea of space, Earth acquires extraterrestrial characteristics. It becomes not only one planet among others, but also a planet that points to and even contains its others. Part-Martian Earth gathers to itself extraterrestrial relatives. An ocean world floating in a more capacious ocean turns Earth not into an ark, perhaps, but into a submarine, whose distinction from its outside is a differential, not an absolute. Not Buckminster Fuller’s Spaceship Earth, but Submersible Gaia.

And Gaia is resilient. Less than an avatar of harmony, it is a cybernetic system, and it can do without humanity. This genre of extraterrestrial relativism does not care about humans. But humanity cannot do without a narrative about Earth, even a transformed one. In her dissertation on American astronautics, “American Extreme,” Valerie Olson writes that

Contemporary American ecologists imagine the future of life on Earth in astronomical terms as a kind of “return” to an original planet, such as ex-NASA contractor James Lovelock’s “Gaia,” or as an arrival to an utterly hostile one, such as Peter Ward’s vengeful “Medea.” There is also Bill McKibben’s “Eaarth,” the title of his book predicting the human need to adjust to the permanent transformation of our planet. The book was released with jacket image featuring a small whole Earth rising—or setting—behind a giant black “X.” (2010:9)

Recursively operated extraterrestrial relativism becomes a survival strategy, one that returns to humanity as the arbiter and measure of Earthly health. In this sense, this species of extraterrestrial relativism may have something in common with what Clifford Geertz (1984) described as “anti-anti-relativism”—not a double-negated position that simply snaps back to relativism full stop, but rather a position that indexes a commitment to understanding how conditions relative to which a phenomenon is to be understood are themselves arrived at.

The Objective Conditions of Extraterrestriality

Why is this materializing now, this extraterrestrial imagination? Olson writes that, for today’s science, the “extreme” has come to be “regarded as a vital site (a place or condition) in which essential truths and proofs emerge,” and that, more broadly, in American popular culture, the extreme is now used “to signify ‘ultimate’ generative, liberatory, alternative, and transcendental states of being; there are extreme sports, extreme foods, and extreme makeovers” (2010:7). For Olson, the extreme is bound up with particularly American stories about limits, frontiers—and in that sense is not a relativist frame at all, but rather an argument for continued exploration in a neo-colonial key.

Sociologist Melinda Cooper suggests that life's newfound extraterrestrial elasticity is not only a function of work in the biosciences, but is also a function of capitalism:

the notion of life itself is undergoing a dramatic destandardization such that the life sciences are increasingly looking to the extremes rather than the norms of biological existence. Importantly, these new ways of theorizing life are never far removed from a concern with new ways of mobilizing life as a technological resource. (2007:32)

Cooper argues that attention to extreme life forms is coincident with a capitalism anticipating and seeking to overcome its own ecological limits. In the wake of the Club of Rome's "Limits to Growth" report of 1972, which predicted environmental collapse if world industry and population continued to grow exponentially, capitalists began looking out for new modes of capital accumulation. Rejecting the geochemical finitude of Earth as the last word on limits, Reagan-era futurologists chided the Club of Rome for a failure of imagination for not anticipating the promise of biotechnology. Cooper detects in contemporary interest in extreme life forms—in researches into how biological systems continually redefine the limits of life—raw ideological material for fresh kinds of capital that burrow into the generativity of living things to create new fantasies of endless frontiers of surplus. That framing suggests that the "extreme" or "limit" may be, like the "mania" that Emily Martin (2009) finds valorized in popular culture and psychology, a sign not of biology unbound, but of its bending toward a political economic purpose (in this context, the appearance of the extreme in high-art worlds may also be a symptom, as with Eduardo Kac and Avital Ronell's 2008 bioart book, *Life Extreme*).

But I want to offer another reading. For many of the scientists I know, the "extreme" is not always about testing humans and their institutions—as in Olson's excellent ethnography in which this is very much the case for her astronaut interlocutors—but is rather about relativizing biology, and, by extension, "nature." This is not the "anthropomorphized cosmos" (2010:127) Olson found in her research, but rather a kind of nonhuman—even posthuman—relativism. It may intersect with the recent philosophy and art movement called "Speculative Realism," which seeks to produce philosophies and aesthetic objects that do not privilege or orient toward the human (Brassier 2007).

Still, yet another folding back seems necessary to this analysis. Advocates of privatized space travel (Valentine this issue), of asteroids as destinations for exploration (Olson this issue), and Singularitarians (Farman this issue) often conjure their visions of extreme futures with respect to very human concerns. In some cases, such people speak from addresses of class and race privilege, and, in that sense, their extraterrestrial relativism represents not just a humanist point of departure, but an elite vanguardist one. Of course, even in less humanly oriented extraterrestrial relativisms—those documented in this issue by Battaglia and Hoeppe for cosmonauts and astronomers, respectively, and those of astrobiologists, here—human locations and histories are ever present. As indeed they are in Speculative Realism, which, for all its anti-humanism actually posits a particular kind of nature (machinic, unyielding, sublime), and therefore, as Gayatri Spivak (1988) might have it, hosts within it invisible authors who deny their authorizing and authoritative presence. Karen Barad’s “agential realism” (2007), which posits that reality always manifests as such—comes to matter—with respect to an observing and participating agent, offers another useful query for speculative realism.

And for comparative relativism. The various flavors of extraterrestrial relativisms I have discussed here exist at the uneasy interface of speculative realism and agential realism, with “reality” at once abstracted away from human and organismic concerns and never quite achieving escape velocity. One might add to Casper Bruun Jensen et al.’s (2011) catalog of kinds of comparative relativism *speculative relativism* and *agential relativism*. In the hybrid of those two that is extraterrestrial relativism, the very nature of nature—as a space of the real, as a space of/for agency—may be becoming unmoored, something like the aquatic cyborg bodies in the novel *Starfish* with which I opened, working at the limits of categories and phenomena. ■

Acknowledgments:

I thank Debora Battaglia, Valerie Olson, and David Valentine for their fine piloting of the Starship X-treme. Debora Battaglia in particular pressed me into areas of time-space I had not thought to chart. I am grateful to Lisa Messeri and Heather Paxson for comments. I also thank participants at the University of Minnesota’s Institute of Advanced Study Human/Nonhuman Research Collaborative, who read this paper in February 2011. The three anonymous reviewers for *Anthropology Quarterly* asked excellent questions of this piece.

Endnotes:

¹Wolfe-Simon's claim was later roundly critiqued, even, many declared, definitively disproven (see Erb et al. 2012), indicating that extraterrestrial relativism is not always so easily unmoored from Earthly comparison.

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Foreign language translations:

Extraterrestrial Relativism

[Keywords: Comparative relativism, extraterrestriality, nature/culture, astrobiology]

外星相对论

[**关键词:** 比较相对论, 治外法权, 自然/文化, 天体生物学]

Инопланетянский релятивизм

[Ключеве слова: сравнительный релятивизм, инопланетянство, природа/культура, астробиология

Relativismo Extra-terrestre

[Palavras chaves: Relativismo comparativo; condição extraterrestre; natureza/cultura; astrobiologia]

النسبية للوجود في ما وراء جو الأرض

الكلمات الجامعة: النسبية المقارنة، الوجود خارج ما وراء جو الأرض، الطبيعة/الثقافة، علم الأحياء الفضائي