

# HOW DO WE REGULATE THE UNIVERSE?

It may involve a bit of science fiction, and it certainly calls for forethought on current findings and the development of technology for exploring the cosmos, but this is the important question a team of researchers from the Faculty of Jurisprudence of the Universidad del Rosario has been considering: what kind of law should be applied to space?

**A**t the end of February, NASA surprised the world with news that there are seven exoplanets in the habitable zone around the star Trappist-1, 40 light years away from our solar system. These newly discovered planets orbit a star distant from our sun in an area where atmospheric conditions make the existence of liquid water possible, and three of the planets offer strong possibilities that they could host what we understand as life forms.

The discovery, described in the prestigious British journal *Nature*, brings to mind some questions that humans have long asked: Are we alone in the universe? And, if Earth can no longer support us, will we have the option of emigrating somewhere else?

"This discovery should make us reflect on the astounding dimensions of the cosmos, and particularly on the significance of our humanity in this vast universe in which we inhabit a planetary system on the periphery of a galaxy, the Milky Way, that has approximately 300 billion stars similar in some way to our sun. But our Milky Way is just one of what the University of Nottingham calculates to be 2 trillion galaxies," points out Juan Ramón Martínez Vargas, professor in the Faculty of Jurisprudence at the Universidad del Rosario.

"That profound understanding of the universe in which we find ourselves leads to the necessity to understand it, travel to its furthest reaches, conquer it, and of course, establish laws for it," he says.

Martínez Vargas is director of the Research Group on International Law at El Rosario, and

visiting professor at universities in the Americas, Europe, and Asia. He and his research group (comprising students María José Vargas, Laura Quijano, and Alejandra Soler, attorney Daniela Almario, and Professors Jairo Becerra of the Universidad del Rosario, and Macarena Domínguez of the University of Barcelona) have spent eighteen months reviewing current law as it applies to outer space and celestial bodies. Their work combines with efforts by another working group looking at aerospace law. Analyzing current debates on the subject, the researchers have identified gaps in the law and formulated alternatives that should help to further develop the existing corpus juris. They hope to complete this work in one year and put it out through a book.

"Current regulation of outer space is minimal because it has been based on agreements between super powers that have the technology and resources to carry out space exploration but do all they can to avoid the imposition of any limits to their actions. The situation today has undergone a change, however. States are no longer alone in space exploration, since multinational corporations and large private sector companies have now taken the lead in this space race," says Professor Martínez.

"At the present time," he adds, "we don't have adequate tools to respond to the unknown number of disputes that may arise. On the one side we have the 1967 Outer Space Treaty, which is too general and vague, and on the other a corpus juris spatialis that is anachronistic in its fictive conception of a society imbued with the fear imposed by the Cold War era. We are convinced of the need for a legal framework relevant not only to the present, but able as well to anticipate potential events in the near future and their possible effects."

### SPACE MISSIONS WILL MULTIPLY

It is expected that from 2022 there will be a greater number of space missions due to new developments in space shuttles, telescopes that surpass Hubble and, in general, other technological developments that will allow us to study and understand the universe with more precision and discover

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more galaxies, stars, and planets than we ever imagined.

The Research Group on International Law believes that we have not yet been able to comprehend what could take place and should be prepared for any eventuality. "In regard to the planets that we have discovered, which may be exobiologically similar to ours, we ask if man could consider appropriating them? Is it legally possible to own such celestial bodies as property? This would not be possible under existing law, because they are *res communis omnium*, common to the community of mankind. This supposition should be reexamined, however, because it is

an urgent matter of survival to gain access to other planets and think about their appropriation and use for the benefit of humankind," explains Martínez.

In fact, one of the burning issues that the research group has considered is the possible appropriation of outer space and the celestial bodies on the basis that humankind has an obligation and responsibility to begin colonizing other planets to guarantee the survival of the species.

"Our planet is coming close to a point of no return. It is within a couple of centuries of a systemic collapse that may be generated by demographic explosion, the indiscriminate exploitation of resources, accelerated climate change, looming pandemics, nuclear wars, intolerable levels of solar radiation, or any other phenomenon that puts the life of humans in jeopardy on this Earth. As things are today, if our planet perishes, the human species will disappear. Nothing could be more catastrophic," says the professor.

### A UNIVERSE FOR ALL

According to the research group, international law should confront this reality by advocating for compliance with environmental obligations and enforcing the rule of law on international security matters. It should also work to protect human rights as a corollary of sustainable development, among many other tasks. And efforts should continue to establish norms for the most beneficial use of outer space.

"But what happens if in exploring the cosmos we encounter intelligent forms of life—a likelihood according to the Drake equation—and these exercise sovereignty over territories of interest to humanity? Could humans impose their law? That's where we face a legal and ethical challenge that has been partially solved," explains Martínez.

An obligation for the non-appropriation of outer space and celestial bodies was discussed at the 1966 Space Conference, meaning that there would be no imposition of human law on other forms of life in space, and especially that there would be no appropriation of celestial bodies by States or individuals. Nonetheless, this principle was modified in 1979 in relation to the moon. Humankind determined that the moon belonged to our species due to its symbiotic relationship with Earth.

The proposal of the group is that this outlook be extended to our entire solar system. "We have determined that there is water, but no sign of intelligent life on planets other than our own in the solar system, so to avoid any possible exploitation of other planets to benefit private parties and limit such activ-



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ity to humanity as a whole, man may comprehensively protect the entire system—from the sun to the Oort cloud—by applying the common heritage principle,” says Martínez.

The motivation for this would have to do with the extensive resources that exist on the celestial bodies of the solar system, which could be exploited some day for the benefit of humankind.

Also discussed in this work are proposals regarding the responsibility of States and individuals, environmental law, peace, and security in space, and labor law with respect to astronauts. The latter is an issue because in the not very distant future, more humans of different nationalities will find themselves

in space and there will be a need for clarity on their employment status.

In relation to this matter, the team has reviewed the work of the International Labor Organization regarding the regulation of highly dangerous work, extrapolating it to work in space. “There’s a need to establish a legal framework for the protection of workers who engage in activities with such a high level of risk,” says Professor Martínez.

These examples allow us to bring legal developments “down to earth” as technology develops and provides for increasingly greater exploration of the universe. In this sense, matters regarding the cosmos are no longer the exclusive domain of planetary scientists and astrobiologists. Now, experts in jurisprudence must also turn their attention to this field. It is worth taking very seriously indeed the words of NASA’s chief scientist Thomas Zurbuchen at the press conference announcing the discovery of Trappist-1’s seven planets: “this discovery gives us a hint that finding a second Earth is not a matter of if but when.” ■