

In-Person One-Day Conference

Humanities in the Age of Space Exploration

Friday, the 19th of January 2024

Nishi-Chiba Campus, Chiba University, Japan

Speakers:

小林鷹之 / Takayuki Kobayashi (衆議院議員 / The House of Representatives)

Anthony Milligan (KCL)

高橋秀幸 / Hideyuki Takahashi (千葉大学 / Chiba University)

Konrad Szocik (UITM in Rzeszow)

伊勢田哲治 / Tetsuji Iseda (京都大学 / Kyoto University)

Oskari Sivula (University of Turku)

竹内悠 / Yu Takeuchi (JAXA)

Mikko Puumala (University of Turku)

Jasmin della Guardia (千葉大学 / Chiba University)

Organizer:

立花幸司 / Koji Tachibana (千葉大学 / Chiba University)

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Japan Society for Aeronautical and Space Sciences (JSASS)

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Registration: <https://forms.gle/jqtVCTmDTEjaMdz68>

Registration fee: free



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CHIBA UNIVERSITY

Program

- 12:50-13:00** **Opening Remarks**
 Koji Tachibana, PhD (Chiba University, Japan)
- 13:00-13:30** **“Towards a new era of space: Efforts to promote space development”**
 Takayuki Kobayashi (The House of Representatives, Japan)
- 13:30-14:00** **“Are we ready for a space age?”**
 Anthony Milligan, PhD (King’s College London, UK)
- 14:00-14:30** **“Issues related to the establishment of a food production system in space”**
 Hideyuki Takahashi, PhD (Chiba University, Japan)
- 14:30-14:50** **Tea/Coffee Break**
- 14:50-15:20** **“Can we do more in space than on Earth? A feminist perspective on the bioethics of space exploration”**
 Konrad Szocik, PhD (University of Information Technology and Management in Rzeszow, Poland)
- 15:20-15:50** **“Being consistent about radiation exposure”**
 Tetsuji Iseda, PhD (Kyoto University, Japan)
- 15:50-16:20** **“Long-term future, environmental ethics and outer space”**
 Oskari Sivula, MA (University of Turku, Finland)
- 16:20-16:40** **Tea/Coffee Break**
- 16:40-17:10** **“The role of the law and lawyers in emerging space age”**
 Yu Takeuchi, PhD (JAXA, Japan)
- 17:10-17:40** **“Enough and as good for everyone? A Lockean perspective on appropriating extraterrestrial resources”**
 Mikko Puumala, PhD (University of Turku, Finland)
- 17:40-18:10** **“The loneliness of infinite expanse”**
 Jasmin della Guardia, MSc (Chiba University, Japan)
- 18:10-18:20** **Closing Remarks & Announcements**
- 18:40-** **Social Dinner (t.b.a.)**

Organizer



Koji Tachibana, Ph.D. is an Associate Professor of Philosophy in the Faculty of Humanities at Chiba University, Japan, and an International Associate Scholar at Georgetown University Medical Center, USA. Koji studies Aristotle's ethics, contemporary virtue ethics, neuroethics, and space ethics. Recent publications related to space include book chapters such as "Ethics in space security: Virtue and the future of cosmopolitanism" in *The Oxford Handbook of Space Security* (Oxford University Press, 2024), "Virtue ethics

and the value of saving humanity" in *Human Enhancements for Space Missions: Lunar, Martian, and Future Missions to the Outer Planets* (Springer, 2020), "Workplace in space: Space neuroscience and the performance management in terrestrial environments" in *Organizational Neuroethics: Reflections on the contributions of neuroscience to management theories and business practice* (Springer, 2020), and peer-reviewed articles, including "A Hobbesian qualm with space settlement" (*Futures*, 2019), "Nonadmirable moral exemplars and virtue development" (*Journal of Moral Education*, 2019), and "From outer space to Earth—the social significance of isolated and confined environment research in human space exploration" (*Acta Astronautica*, 2017). Koji has also published several Japanese translations of Western philosophical texts: He published the latest Japanese translation of Aristotle's *Nicomachean Ethics* (2015/2016, with Kunio Watanabe), supervised the Japanese translation of *The Cambridge Companion to Virtue Ethics* (2015); and was a co-translator of Philippa Foot's *Natural Goodness* (2014) and Donald Davidson's *Truth, Language and History* (2010). He is currently a member of the advisory council of METI and a member of the board of directors of the Institute of Humanities and Social Sciences for the Space (IHSS) as a section of the Interdisciplinary Collaboration and New Field Development Committee in the Japan Society for Aeronautical and Space Sciences (JSASS).

Speakers



Takayuki Kobayashi is a member of the House of Representatives, the former Economic Security Minister, and the former Space Policy Minister of Japan. In 1999, he graduated from the University of Tokyo's Faculty of Law and started to work in the Ministry of Finance in Japan. In 2003, he completed a master's degree at the John F. Kennedy School of Government at Harvard University (now Harvard Kennedy School). After working as an assistant director in the General Affairs Division, Financial Bureau of the Ministry of Finance and as a secretary of the Embassy of Japan in the U.S., he was first elected to the House of Representatives in the

46th general election in 2012 and is currently serving his fourth term. He served as Parliamentary Vice-Minister of Defense in 2016. In 2021, he submitted a legislative bill “the Space Resources Act” and contributed to passing of the bill. He served as Economic Security Minister and Space Policy Minister in the Cabinet Office in 2021, where he worked for the establishment of the Economic Security Promotion Bill in 2022. In 2022, he was a member of the Budget Committee. Currently, he is the director of the Commission on the Constitution of the House of Representatives and secretary-general of the Special Committee on Space and Ocean Development of the Liberal Democratic Party. He published *The New Era of Space Business! Explanation of the Space Resources Law* (co-edited with Keitaro Ohno, Tokyo: Daiichihoki, 2022; in Japanese).

Title: Towards a new era of space: Efforts to promote space development

Abstract: In 2019, I directly appealed to the then-chairman of the Special Committee on Space and Maritime Development of the Liberal Democratic Party, Takeo Kawamura, and established a working team on space legislation and treaties under the committee, becoming its chairperson. I led discussions on the Space Resources Act (that was established later as a parliamentary law), Space Situation Awareness (SSA), and Space Traffic Management (STM). Based on the National Security Strategy, which was revised at the end of 2022, the Space Security Initiative was drawn up in June 2023, and the Basic Plan on Space Policy was revised. In this presentation, I will discuss the perspectives on space industry development and promotion in view of a future, major revision of Japanese legal settings on these topics.



Anthony Milligan, Ph.D. is a Research Fellow in the Philosophy of Ethics with the *Cosmological Visionaries* project, based out of the Department of Theology and Religious Studies at King's College London. His work runs along two axes. The first concerns outer space and involves a good deal of crossover with the sciences. The second involves time, and the way that our understanding of it is shaped by love. This involves work rooted more in the humanities. His most recent book was *The Ethics of Political Dissent* (2022), dealing with the crossover between love, compassion and politics. Currently,

he is working on a SpringerBrief provisionally titled *Indigenous Cosmological Visions of the Pleiades* and (along with Koji Tachibana) a short book on *What is Space Exploration For?* to be published by Bristol University Press. Previous books include *Pravda v době populismu/Truth in a Time of Populism* (2019); the co-edited white paper on *Astrobiology and Society in Europe* (2018); the co-edited volume *The Ethics of Space Exploration* (2016); *The Next Democracy?* (London: Roman and Littlefield, 2016); *Animal Ethics: The Basics*, (2015); *Nobody Owns the Moon: The Ethics of Space Exploitation* (2015); the co-edited volume *Love and its Objects* (2014); *Civil Disobedience: Protest, Justification and the Law* (2013); *Love* (2011); and *Beyond Animal Rights: Food, Pets and Ethics* (2010), which has also been translated into Korean. Additional roles include Associate Editor for the Springer *Space and Society* series. Tony has written extensively on space and society at an academic and popular level, and regularly gives interviews to publications about space issues. He has been quoted on space matters in major national newspapers and magazines, such as *The Guardian* and *Scientific American*.

Title: Are we ready for a space age?

Abstract: The more credible skepticisms about human activity in space, such as Daniel Deudney's *Dark Skies* (2020), J.G. Ballard's *Memories of the Space Age* (1988), or Amitai Etzioni's *The Moon-Doggle* (1964), are time-indexed. They accept that *eventually* our human presence will include mining and settlements off-world. But they reject the idea that *now* is the right time to begin the process of space expansion. The recurring thought of such skepticisms is that expansion into space is a way of neglecting Earth, or escaping from our environmental responsibilities, or (less plausibly) a preparation by elites to abandon Earth in favour of Mars. This paper will outline the emerging shape of space skepticism, identify its key problems, and then go on to argue that the wrong kinds of skepticism are becoming dominant.



Hideyuki Takahashi, Ph.D. is a project professor at the Graduate School of Horticulture, Chiba University. He was appointed to the director of the Research Center for Space Agriculture and Horticulture when it was founded on January 1, 2023, with its affiliation to the Graduate School of Horticulture. Before Prof. Takahashi came to Chiba University to take up his new post, he served as a professor at the Graduate School of Life Sciences, Tohoku University in Sendai. He has been dedicated to the research on the mechanisms underlying plants' responses to their environment and growth regulation. In space-utilized

research, he was a PI of four spaceflight experiments aboard the space shuttle and the International Space Station (ISS), uncovering the mechanisms that drive the gravity-influenced phenomena in plant growth and development. Also, Prof. Takahashi played important roles in various scientific communities including space-related societies and committees; for example, as a chair of the sub-commission on Gravitational and Space Biology at the Commission on Space Research (COSPAR) (1998-2004), the president of the Japanese Society for Biological Sciences in Space (2013-2017), a representative of the Japanese Science Union for Human Planetary Habitation in Space (2016-2019), a member of the JAXA Advisory Committee for Space Utilization Sciences (2009-2015), and a chair of the JAXA Sub-committee for Space Utilization (2017-2019).

Title: Issues related to the establishment of a food production system in space

Abstract: There have been many studies on the effects of space environment on plant growth and development. Since the era of space stations such as Salyut, Skylab, Mir, and ISS, in particular, long duration experiments have advanced our understanding of plant growth under spaceflight conditions. Now, human beings challenge the exploration of Moon and Mars by manned missions. It is pointed out that local production for local consumption of foods is necessary for our long duration stay or habitation in space. Plant factory with artificial light is considered as a plant production system in space. However, crop cultivars and cultivation techniques suitable for efficient food production in space remain unexplored. In addition, the food production needs to be performed together with a sustainable material recycling and circulation in a closed life support system. The Research Center for Space Agriculture and Horticulture is engaged in working on these issues by three research divisions, New functional Plants for Space, Highly Efficient Plant Production in Space, and Zero-emission Technology for Closed Ecosystem. To accomplish our goals, we must investigate psychological or the humanities-associated issues as well. The issues involve sense of well-being, choice and taste for meals, new ethnical and cultural development, and countermeasures against injury, disease, and depression. This paper addresses how human beings live on Moon/Mars and travel to far deep space with good health and in safety.



Konrad Szocik, Ph.D. is an assistant professor at the University of Information Technology and Management in Rzeszow, Poland. From 2021 to 2022 he was a visiting fellow at the Interdisciplinary Center for Bioethics at the Yale University, the US. His research interests are in the philosophy, ethics and bioethics of space exploration, particularly in relation to feminist philosophy and bioethics, risks of inequality and exclusion, reproductive issues,

human enhancement. He also relates these considerations to current and future challenges on Earth. He is the author of a monograph titled *The Bioethics of Space Exploration* published in 2023 by Oxford University Press. He is also the author of the monograph *Feminist Bioethics in Space*, planned for publication by the same publisher next year. He is also the editor of three collective monographs in Springer's *Space and Society* series. He is also the editor of the Springer publishing series *New Approaches to the Scientific Study of Religion*. He is the principal investigator of a research project entitled "Bioethics of Space Exploration," funded by the National Science Center in Poland.

Title: Can we do more in space than on Earth? A feminist perspective on the bioethics of space exploration

Abstract: The subject of this paper is an analysis of potential differences and similarities between bioethics dealing with biomedical problems on Earth and the bioethics of future space exploration. A feminist perspective will be invoked, which, on the one hand, always makes us keep in mind the risk of oppression and exclusion, but, on the other hand, suggests paying attention to the justification and goals of the mission. There are quite strong rationales in favor of recognizing that, due to the peculiarly harsh conditions of the space environment and the demanding nature of space missions, it is justified to apply somewhat different bioethical standards than those for terrestrial problems. However, these slightly different standards have rather negative connotations, as they imply consent to the loosening of moral standards, to the minimization of the validity of certain principles and rules. Such a position, which can be described as moral exceptionalism, has its adherents and makes the bioethics of space exploration similar to military bioethics. The military community is also acquiescing to more in terms of moral standards. Military bioethics seems attractive for the space mission exploration environment because of the difficult and risky mission conditions that can justify the broad concept of crew self-sacrifice. This possible reference to military ethics and bioethics is reinforced by the fact that space missions known from history are in a sense militarized and more or less harnessed in the service of nationalism. But would this approach to space bioethics be a desirable solution? The object of this paper is to discuss these methodological issues and to point out the methodological peculiarities of space mission bioethics, which both justifies and precludes treating space in a morally unique, bioethical way. In the paper, using a feminist critique, I reject the concept of the moral uniqueness of the space mission environment. I point out that the harsh environmental conditions, as well as the high – capitalist-nationalist stakes of the mission, cannot justify limiting autonomy or, in the potential far-flung prospect of space settlement, limiting reproductive rights.



Tetsuji Iseda, Ph.D. is Professor of Philosophy and History of Science, Graduate School of Letters, Kyoto University. He mainly works in two philosophical fields, philosophy of science and ethics. As a meeting point of these two fields, he has been working on applied issues related to recent developments in science and technology. Ethical issues related to space exploration and development, now called space ethics, is currently one of Iseda's main research focuses. Among space ethics topics, his particular interest is in integrative environmental ethics that include space debris related issues and consistent approach to radiation exposure on the earth and in the space. At Kyoto University Unit of Synergetic Studies for Space (USSS), Iseda organized a research group on space ethics in

2015, whose research outcome was published as an anthology titled *Uchuu Rinrigaku* (Space Ethics) in 2018. Currently Iseda is a director of an educational program called "Space Ethics Education Program" (SEEP), which is a kind of interdisciplinary certificate program for Kyoto University students, but also accepts a limited number of general citizens. This is a two-year program that offers classes on space ethics, and participants who want to receive the certificate should complete course work and write an essay on space ethics.

Title: Being consistent about radiation exposure

Abstract: There are several on-going projects that try to send astronauts to Mars. One obstacle to such a long distant space trip is the level of expected radiation exposure (estimated as approximately 1 sievert for a round-trip to Mars). The existence of this obstacle is widely recognized, but there is an associated, but less recognized issue, namely the consistency of radiation exposure policy with regulations on the earth. 1 sievert exposure in several years is inadmissible level for radiation related workers on the earth; is there any justification for tolerating that level for astronauts as workers in the space? Does the honor given to Mars astronauts justify the risk? Does the overwhelming risk of Mars exploration justify the relatively minor risk of radiation exposure? If we think seriously on this issue, we find that easy answers do not work.



Oskari Sivula, M.A. is a Doctoral Researcher at the Department of Philosophy, Contemporary History and Political Science at the University of Turku where his current research focuses on space ethics, environmental philosophy and intergenerational ethics. Sivula has an MA in Philosophy from the University of Amsterdam. He just returned from the University of St Andrews where he was a Visiting Scholar at the Centre for Ethics, Philosophy and Public Affairs. Sivula is also doing a second master's degree in Global Politics at the University of Helsinki. Recently he has published on topics such as space settlements, human enhancement for space flights and directed panspermia.

Title: Long-term future, environmental ethics and outer space

Abstract: The aim of this talk is to explore the implications of thinking about environmental value truly long-term. Longtermism is a recently articulated ethical view according to which we should be especially concerned about the impacts our actions can have upon the far future. Usually when longtermism and outer space are discussed jointly, one encounters ideas about humans settling other planets. This is because space colonization allows the mitigation of existential risks, larger populations of humans and grand futures according to some longtermist scholars. Moreover, longtermism has thus far been rather anthropocentric. This is partly because lontermist thinking has emerged from the realization that we can mitigate the risk of *human* extinction. However, longtermism does not necessarily have to be so human-centered. Indeed, it can be coupled with different views of value. If, for example, moral considerability is extended to non-human animals, ecosystems or life in general, longtermist reasoning about space may look radically different.



Yu Takeuchi, Ph.D. is a legal expert in Japan Aerospace Exploration Agency (JAXA). He is currently an Advisor to the Director of the Management and Integration Department of Research and Development Directorate. He is also a Researcher at the Institute of Space Law of Keio University. In his entire career at JAXA, he mainly worked for legal affairs and budget administration in the field center, except his appointment to the Legal Affairs Division of the HQs and to the Ministry of Foreign Affairs for two years each. He

received his Ph.D. in law from Keio University in 2023. His main research interest is in international space law inter alia, the legal aspects of space traffic management, and sustainable space activities. He is organizing a session entitled “Law and Policy for Sustainable Space Activities” in Space Sciences and Technology Conference (“Ukaren”) from 2020 where the elaboration of normative development of sustainable space activities has been discussing. He is one of the co-authors of the book co-edited by Souichirou Kozuka & Masahiko Sato, *Introduction of Space Law for Entrepreneur (2nd. Ed.)* (Yuhikaku, 2018). His most recent articles includes, “Lawyers' Role in Law and Policy Making Process of Space Activities”, Vol.74, No.4 Houritsu no Hiroba, 2021; “Implications of State Authorization and Continuous Supervision for Contemporary Space Activities”, Proceedings of the International Institute of Space Law 2020, Eleven, 2021, pp. 419-428; “Law and Policy for Space Situational Awareness towards Space Traffic Management – A Japanese Perspective –”, Vol.6, No.2 Journal of Space Safety Engineering, 2019. He is a member of the Air Law Institute of Japan, Japanese Society of International Law, the Japan Society for Aeronautical and Space Sciences, and the International Institute of Space Law (IISL).

Title: The role of the law and lawyers in emerging space age

Abstract: In the history, the rationale of space law has always been explained from political aspects. However, the primary role of the law in general is to allow the sound and smooth development of the community activities. While entering into a space age, current space law needs to incorporate the notion of settlement of the human beings in another planet into its current political context. Legislation allowing private ownership to planetary resources in the US, Luxemburg and Japan can be understood as its embryo. However, the largest thresholds for transplanting that intention to space law will be the community's consensus as law is merely a reflection of the community will. Being embroiled in this complex, lawyers will take the role of organizing the existing rules, showing multiple elaborating options based on the existing rules, constructing legitimate theories and explaining them to lawmakers, and showing several ways of comprehension to recall imagination in their operations. With these discussions, this paper will try to enlighten the significant role of the law and lawyers in emerging space age.



Mikko M. Puumala, Ph.D. is a postdoc researcher in University of Turku, Finland. Puumala defended their thesis in October 2023. The dissertation, *Can ordinary morality survive the climate crisis? A philosophical analysis of moral demandingness and climate change*, was in the field of climate ethics and moral philosophy. Puumala's other research interests include space ethics, environmental ethics, and philosophical methodology. In space ethics, Puumala mainly focuses on topics like environmental protection and sustainability, extraterrestrial resources, and space settlement. Together with

Oskari Sivula and Kirsi Lehto, Puumala recently published a paper "Moving to Mars: The Feasibility and Desirability of Mars Settlements" in *Space Policy*. Puumala is also the coordinator and founder of *Nordic Environmental Ethics Network* and has organized numerous environmental ethics conferences in the Nordic-Baltic region.

Title: Enough and as good for everyone? A Lockean perspective on appropriating extraterrestrial resources

Abstract: As the New Space Age intensifies, extraterrestrial resources may soon be within human reach. This paper discusses the issue of space mining and appropriating extraterrestrial resources from the perspective of Lockean property theory. Some have claimed that space is Locke's ultimate triumph, providing endless resources and always leaving 'enough and as good for others' to appropriate. A Lockean approach seems to promise a *laissez-faire* private property system. Moreover, private property rights have been defended as a crucial incentive for developing necessary space technologies and speeding up the space future. Unsurprisingly, this Lockean approach has gained some interest, especially in the space law literature. The paper examines two challenges for the Lockean approach. The first question is the fittingness of the Lockean system for extraterrestrial resources. For instance, the Lockean justification for private property gains its impetus from being necessary for satisfying basic needs. Arguably, extraterrestrial resources are not a proper target of basic need. The second challenge is that Locke's *sufficiency proviso* produces problematic implications when extraterrestrial resources are considered. If there is virtually no scarcity, 'enough and as good' is always left for others. To supplement the discussion on both needs and what is meant by 'as good', a philosophical analysis on the nature of extraterrestrial resources will be provided.



Jasmin della Guardia, M.Sc. is a doctoral student at the Graduate School of Humanities and Public Studies, Chiba University. She studied psychology at the Friedrich-Alexander University in Erlangen and received her master's degree in psychology from the Otto-Friedrich University in Bamberg, Germany. Her research interests include the field of human enhancement, space psychology, fiction and their intersection. In particular, the intersection between humans and technology determines her work. Her work uses an interdisciplinary approach with a focus on ethics and psychological research, including relevant contemporary discussions. An important aspect of her work is to close the gap between society

and science and therefore to integrate society in her projects directly or to make science more appealing for society. One of her recent works was "Space Refuge: A case report on Cyberpunk Edgerunners" (2022) (with N. Döbler and C.C. Carbon), discussing human enhancement in anime, space and cyberpunk. Currently, she is working on a chapter in *The Handbook of Transgender Science Fiction* provisionally titled "Transformation of bodies in Anime" and a presentation "Cosmic home" at the 7th Moon Village Conference (both with K. Tachibana). Previous works include "Stumbling affords remembrance" (2022); a project about the affordance of memorial of NAZI-victims (with N. Döbler and C.C. Carbon).

Title: The loneliness of infinite expanse

Abstract: The Search for Extraterrestrial Intelligence (SETI) has yet to discover evidence of intelligent Extraterrestrial life (Lukic, 2018) encountering the paradox of the *great silence* (Brin, 1983). However how and why we think about Extraterrestrials (Döbler & Carbon, 2021) is highly psychological and is known as the science of Exopsychology. Technology promises further advances in space travel and space colonization with each passing day (Genesan, 2022). We need to take a moment to think about why we are longing to find Extraterrestrial life. As our need for connection to others on Earth, the idea of being alone as the only intelligent life form in the universe may frighten us. Confronted with infinite space, ultimate loneliness and living in space could create a striking loneliness. Loneliness is linked to immense psychological and physical diseases (Heinrich & Gullone, 2006). We want to discuss the special aspects of loneliness in space, the differences and similarities on earth. We also want to investigate what clinical psychology can teach us that can be applied to space and potentially be applied to treat loneliness in space or on Earth.

Venue

- Multimedia Conference Room (the second floor), Graduate School of Humanities and Social Sciences, Nishi-Chiba Campus, Chiba University.

- Access to the Nishi-Chiba Campus:

https://www.chiba-u.ac.jp/e/about/location/access_to_nishi-chiba_campus.html

