Extraterrestrial Intelligence

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Academic and Societal Implications

Edited by
Jensine Andresen
and Octavio A. Chon-Torres

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Jensine Andresen (Ph.D. Harvard University) holds a B.S.E. in Civil Engineering from Princeton University, where she also earned a Certificate from the School of Public and International Affairs. She completed an M.A. degree at Columbia University in Social Anthropology with a focus on China. She also earned her A.M. (master's) and Ph.D. at Harvard University from the Committee on the Study of Religion with a focus on Indo-Tibetan Buddhism. Dr. Andresen is completing *The Kālacakra Tantra: The Initiation Chapter with the Vimalaprabhā Commentary* (forthcoming), a translation of a well-known Sanskrit text with annotations from Tibetan.

Dr. Andresen served as a Visiting Assistant Professor at the University of Vermont, where she taught Science and Religion and world religions. She also was an Assistant Professor at Boston University in the interdisciplinary doctoral program on Science, Philosophy, and Religion. Dr. Andresen also held two academic appointments as a Visiting Scholar at Columbia University, where she later was appointed as an Officer of Research, Associate Research Scholar.

Dr. Andresen edited *Religion in Mind: Cognitive Perspectives on Religious Belief, Ritual, and Experience* (Cambridge University Press, 2001) and she is a co-editor of *Cognitive Models and Spiritual Maps: Interdisciplinary Explorations of Religious Experience* (Imprint Academic, 2000). Dr. Andresen's recent chapter, "Two Elephants in the Room of Astrobiology," published in *Astrobiology: Science, Ethics, and Public Policy* (Wiley/Scrivener, 2021), examines Unidentified Aerial Phenomena (UAP) in the context of the militarization and weaponization of space, which she opposes. Dr. Andresen also is completing two single-authored monographs, *Extraterrestrial Ethics* (Ethics International Press, forthcoming), and *Extraterrestrial Mind* (in preparation).

Dr. Andresen has published multiple entries in *Encyclopedia of Science and Religion* (Macmillan, 2003), a chapter in *Fifty Years in Science and Religion: Ian G. Barbour and his Legacy* (Ashgate, 2004), and articles in many peer-reviewed journals and other publications, including *The International Journal for the Psychology of Religion*, *Harvard Theological*

Review, *Dreaming*, *The American Society of International Law, Proceedings of the 96th Annual Meeting, March 13-16, 2002, Washington, DC: The Legalization of International Relations/The Internationalize of Legal Relations*, *Journal of Cultural Diversity*, *Journal of Sleep Research*, *The Journal of Religion*, *Zygon: Journal of Religion and Science*, *Religion and Education*, *Isis (Supplement, Catching up with the Vision: Essays on the Occasion of the 75th Anniversary of the Founding of the History of Society Society)*, and Boston University's *Focus*. Dr. Andresen is one of the co-authors of *Report on Ecumenical Faith and Genetics Working Group*, which was written as part of work with the Episcopal Diocese of Massachusetts Faith and Genetics Working Group. She also created a six-part videotape series, *Bioethics and Society: Scientific, Ethical, Legal, and Religious Perspectives on Genetic Technologies*.

In addition to her work in academia, Dr. Andresen has held various positions in finance, business, and government.

Eamonn Ansbro

Eamonn Ansbro (Ph.D., Open University, U.K.) is Director and Research Astronomer, Kingsland Observatory, in Ireland. Dr. Ansbro originally was a meteorological observer with the Ministry of Defense in the United Kingdom (U.K.). He later obtained his master's degree with Distinction in Astronomy from University of Western Sydney, Australia. Dr. Ansbro also holds a M.A. in Astronomy and a Ph.D. in Astronomy from the Planetary and Space Sciences Research Institute at Open University in the U.K. There, he carried out a ten-year survey of the outer solar system.

Dr. Ansbro is an elected Fellow of the Royal Astronomical Society and is the National Coordinator for Ireland in Astronomy Education for the International Astronomical Union. He is a member of the U.K. SETI [Search for Extraterrestrial Intelligence] Research Network, the European Astrobiology Network Association, and the Society of Photo Instrument Engineers. Dr. Ansbro also is an European Union COST [European Cooperation in Science & Technology] Action member for polarimetry studies in the solar system.

Dr. Ansbro currently is Director of Kingsland Observatory in Ireland and Observatorio de las Animas in Spain. At the former, he is involved in operating multisensor platforms to detect UAP, and he collaborates with Space Exploration Limited on new, experimental quantum communication methods to communicate with the extraterrestrial intelligence (ETI) behind

UAP. Dr. Ansbro also operates a suite of robotic observatories in Spain that provide remote access to a wide range of optical telescopes and instruments for multiwavelength observations in astrophysics and astronomy. He encourages schools and universities at all levels up to the doctoral level to avail themselves of both of these facilities.

Octavio A. Chon Torres

Octavio A. Chon Torres (Ph.D., Universidad Nacional Mayor de San Marcos) holds a Doctorate in Philosophy and is Doctorate Candidate in Education and University Teaching at the Universidad Nacional Mayor de San Marcos. He also holds a master's degree in Epistemology and a graduate degree in Philosophy from the same university. He currently is a professor at the Universidad de Lima. His field of study focuses on the philosophy of astrobiology, astrobioethics, and transdisciplinarity, and he is the lead editor of *Astrobiology: Science, Ethics, and Public Policy* (Wiley/Scrivener, 2021).

Prof. Chon Torres is the president of the Asociación Peruana de Astrobiología (Peruvian Association of Astrobiology) (ASPAST), for which he carries out research and scientific dissemination activities. He also is the Director and Founder of the Stratosphere Project, a transdisciplinary research initiative in astrobiology. He has been a member of the advisory board for the White Paper *Astrobiology and Society in Europe Today* (Springer, 2018). Dr. Chon Torres also is a member of the Working Group on Astrobioethics and of the Astrobiology F3 Commission of the International Astronomical Union. Further, he has organized the IV International Congress of Astrobiology (2018), the first event of its nature held in Peru.

Daniel Gross

Daniel M. Gross (Ph.D., Technical University of Munich), now an independent scholar, graduated from ETH Zürich, Switzerland, in experimental solid-state physics. He received his Ph.D. on the production of high-density, high-temperature plasmas from the Technical University of Munich with a research grant at the Max Planck Institute for Plasma Physics for nuclear fusion research.

Dr. Gross then began working at Battelle Geneva Research Centre, first, for a few years, on a phase transition system for infrared viewing; during the next twenty years, he led and oversaw a wide range of applied physics projects in the fields of optoelectronics, microtechnology, and artificial intelligence, most of them supported by large industrial groups in Europe and elsewhere. This work led to over 20 patent applications/patents.

Dr. Gross later became Research Director at Valeo, a global automotive supplier headquartered in Paris, where he evaluated and restructured major parts of their research and development (R&D) activities. Back in Switzerland, he took up a position in a newly formed R&D team of the Swatch Group aimed at developing the ultra-compact two-seater "Smart" car. He subsequently established himself in Neuchatel, Switzerland, as an independent R&D consultant, proposing projects partly based on patent applications of his own.

Over the past fifteen years, Dr. Gross has studied reports of Unidentified Aerial Phenomena (UAP) observed all over the world. In 2013, he wrote a journal article that offers a causal explanation for these enigmatic phenomena, "Unidentified Aerial Phenomena (UAP): A New Hypothesis toward Their Explanation," *Journal of Scientific Exploration* 27, no.3: 415-53. As a young researcher, his interest for what was scientifically known but technically yet to be unexploited led him to become a physicist, inventor, and industrial research manager. Now, he is attracted by scientific border fields where the line between knowledge and belief is blurred.

Chris Impey

Chris Impey (Ph.D., University of Edinburgh) is a University Distinguished Professor at the University of Arizona. For seventeen years he was Deputy Head of the Astronomy Department, and for four years he was Associate Dean of the College of Science. He has 220 refereed publications and eighty conference proceedings in astronomy, and one hundred publications on educational topics. His work has been supported by $20 million in grants from the National Aeronautics and Space Administration (NASA) and the National Science Foundation (NSF). As a professor, he has won eleven teaching awards. He has mentored thirty graduate students and 240 undergraduates. Prof. Impey is a past Vice President of the American Astronomical Society. He has also been an NSF Distinguished Teaching Scholar, a Phi Beta Kappa Visiting Scholar, and Carnegie Council on Teaching's Arizona Professor of the Year. He was a co-chair of the Education and Public Outreach Study Group for the 2010 Decadal Survey of the National Academy of Sciences. In 2009, he was elected Fellow of the American Association for the Advancement of Science, and in 2014 he was the first astronomer named a Howard Hughes Medical Institute Professor.

Prof. Impey aims to convey the excitement of astronomy in as many ways as possible to a large public audience. He gives twenty public talks a year, to audiences as large as 5000 and as varied as NASA engineers, first graders,

and judges of the Ninth Circuit Court. For a decade, he has traveled to India to teach Buddhist monks in a program started by the Dalai Lama. He designed and led four tours for donors and alumni exploring landmarks of science and culture: "Visiting Galileo's Italy;" "Exploring Chile: Earth and Sky;" "Britain in a Golden Age of Science;" and "Origins of Humankind and Astronomy." He has written over forty popular articles on cosmology and astrobiology and co-authored two introductory textbooks.

Prof. Impey's "Teach Astronomy" web site has had over two million unique visitors, and his YouTube lectures and videos have over three million views. He has surveyed over 22,000 college students and members of the public on their science literacy and attitudes towards science. Over 310,000 adults from 165 countries have enrolled in his four Massive Open Online Classes (MOOCs), watching over three million minutes of video lectures since 2013.

In addition to editing eleven books, Prof. Impey has authored nine trade science books: *The Living Cosmos* (Random House, 2007), *How It Ends* (W.W. Norton, 2010), *How It Began* (W.W. Norton, 2012), *Talking About Life* (Cambridge, 2010), *Dreams of Other Worlds* (Princeton, 2013), *Humble Before the Void* (Templeton, 2014), *Beyond* (W.W. Norton, 2015), *Einstein's Monsters* (W.W. Norton, 2018), and the upcoming *Worlds Without End* (MIT, 2022). He has written one novel, *Shadow World* (Dark Skies Press, 2013).

Olena Kalantarova

Olena Kalantarova (Ph.D. candidate, H.Skovoroda Institute of Philosophy) is Researcher adjunct at the Philosophy Institute, Ukrainian Academy of Sciences (Kyiv), where she is majoring in the history of philosophy and Buddhist Studies. She holds a master's degree in Applied Mathematics from Taras Shevchenko National University of Kyiv, Ukraine, where she did specific research on the pattern recognition problems in diagnostic methods of medical cybernetics. She is the founder and leader of the research and education non-governmental project called the Buddhological Laboratory of Ukraine (BUDLAB); a member of the Association for the Study of Esotericism and Mysticism, Russia (ASEM), and international and non-government organization; and a member of the Workshop for the Academic Study of Religions, Ukraine (WASR), a public organization. Ms. Kalantarova has publications in academic journals *Наукма: Наукові Записки* (2016-2019), *Мультиверсум* (2019), *Філософська Думка* (2021), and *Східний Світ* (2021). She graduated at The Highest School of Philosophy under

H.Skovoroda Institute of Philosophy (National Academy of Sciences) Ukraine, Kyiv (2018-2019). She also was educated on the history of philosophy by the Ph.D.-internships program at H.Skovoroda Institute of Philosophy, Ukraine, where her specific research was on Tibetan Buddhism, Sanskrit, and Classical Tibetan. There, she completed thesis research on *The Concept of Time in Buddhist Philosophy by the Example of the Traditions of Kālacakra* (2017-2021). Ms. Kalantarova also graduated from "Современная философия сознания" ("The Course on Modern Philosophy of Mind") at M.V. Lomonosov Moscow State University, Russia (2021), and she participated in a two-year educational program in psychology from Moscow Gestalt Institute, Russia. She also conducted educational and training programs on mathematics and computer science in the Kadamzhai High School No. 17 in Kyrgyzstan.

In addition to her academic work, Ms. Kalantarova conducted independent comparative studies on the ancient sciences of Eastern Europe and Central and Southeast Asia (in particular, Hellenic, Indian, Persian, and Tibetan astrology and Indian and Tibetan yoga). For the last ten years, she has organized expeditions to India, Nepal, and Tibet and conducted field research in Religious Studies on the traditions of the Shaivas, Naths, Bon, and Tibetan Buddhists. She also has participated in the Spiritual Festival Kumbha Mela in Allahabad, India (2013) and in the teachings of the Tenzin Gyatso, the Fourteenth Dalai Lama, in Leh, India (2014) and Riga, Latvia (2016 and 2018).

Ms. Kalantarova is the author of webinars, full-time seminars, interactive seminars, and training programs aimed at improving the skills of students in the field of Tibetan history, philosophy, and psychology. She specifically focuses on the theory and practice of Buddhist Science, which includes the history of the Tibetan tradition of natural philosophy, cosmology, the science of stars, and the metaphysics of time. She has more than twenty years of experience in interdisciplinary studies of astronomical-astrological traditions within the framework of the comparative method of science.

Hakan Kayal

Hakan Kayal (Dr.-Ing., Technical University of Berlin) is a Professor for Space Technologies and the Chair, Informatics VIII, at the Julius-Maximilians-University Würzburg (JMU), Germany. His main research areas are in the design, construction, and operation of space systems, especially in the area of higher spacecraft autonomy and small satellites for exploration. He also is active in the search for extraterrestrial intelligences (SETI) and conducts research on Unidentified Aerial phenomena (UAP). After his study of aeronautics and astronautics at the Technical University of Berlin (TUB), Prof. Kayal conducted his first experiment with the operation of spacecraft at the satellite control center of the Turkish geostationary commercial communications satellite TÜRKSAT 1B in Ankara, Turkey. He then contributed to the international success of the Bi-Spectral Infra-red (BIRD) satellite, which is the first developed satellite of the German Aerospace Center (DLR) launched in 2001. Prof. Kayal was involved in many aspects of the development of the BIRD satellite, was responsible for operations within the developer team, and, later, was the deputy project leader. BIRD demonstrated new infrared sensor technologies in detection and observation of high temperature events such as forest fires onboard of a small satellite.

At TUB, Prof. Kayal was then the project leader of TUB's first pico satellite until 2008. It was launched in 2009 to demonstrate miniaturized reaction wheel technologies in the field of attitude determination and control. After that, he became a professor at JMU where he was responsible for the first nanosatellite, a 3U-Cubesat, which was developed and operated in low Earth orbit (LEO) in 2019. The successor, a 6U-Cubesat, is currently under development. The main objective is to demonstrate the autonomous on-board training and use of miniaturized artificial intelligence technologies in space for detection, classification, and observation of features on Earth. One of the secondary objectives is the detection and recording of transient luminous events such as meteors or lightning. Prof. Kayal also passes on his extensive experience in space technology to employees of relevant authorities, companies, and others in the form of annual courses. He has contributed to research on UAP for several years by developing and operating earthbound intelligent sensor systems, including a detection system in Hessdalen, Norway. His students also take part in this research. Prof. Kayal also has given seminars and interviews in Germany about UAP. He has been operating a telescope for the detection of bright Transient Lunar Phenomena (TLP) on the Moon since 2018 using algorithms and software developed by his team.

Abraham ("Avi") Loeb

Abraham ("Avi") Loeb (Ph.D., Hebrew University of Jerusalem) is the Frank B. Baird Jr. Professor of Science in the Department of Astronomy at Harvard University and holds the Sackler Senior Professorship by Special Appointment at Tel Aviv University. He is an elected fellow of the American Academy of Arts & Sciences, the American Physical Society, and the International Academy of Astronautics and former Chair of the Board on Physics and Astronomy of the National Academies. Prof. Loeb also is a former member of the President's Council of Advisors on Science and Technology (PCAST) at the White House.

At Harvard, Prof. Loeb serves on the President's Task Force of Diversity and Belonging, the Faculty of Arts and Sciences Dean's Faculty Resources Committee, and the Provost's Allston Academic Planning Committee. Prof. Loeb also is founding director of Harvard University's Black Hole Initiative, Director of the Institute for Theory and Computation (ITC) at the Harvard-Smithsonian Center for Astrophysics, and the longest-serving chair of the Astronomy Department at Harvard University (2011-2020). Prof. Loeb chairs the Advisory Committee for the Breakthrough Starshot Initiative and serves as the Science Theory Director for all Initiatives of the Breakthrough Prize Foundation.

Prof. Loeb has published six books and over 850 papers with h-index above 116. He is the bestselling author of *Extraterrestrial: The First Sign of Intelligent Life Beyond Earth* (Houghton Mifflin Harcourt, 2021) and co-author of *Life in the Cosmos: From Biosignatures to Technosignatures* (Harvard University Press, 2021). Previously, he wrote *First Light in the Universe*, Saas-Fee Advanced Course 36, for the Swiss Society for Astrophysics and Astronomy (Springer Berlin Heidelberg, 2008) and *How Did the First Stars and Galaxies Form?*, which is presented in the Princeton Frontiers in Physics series (Princeton University Press, 2010), and he is co-author of *The First Galaxies in the Universe*, which is presented by the Princeton Series in Astrophysics, 21 (Princeton University Press, 2013). He also is the author in Hebrew of מהכוכב הראשון עד לאחרית הימים : מחשבות עד השמים (*Meha-kokhav ha-rishon 'ad le aḥarit ha-yamin*, which rendered into English is *From the First Start to Milkomeda*, Hierarchical, 2015). An advocate for science outreach to the public, Prof. Loeb is a frequent contributor to *Scientific American* and other publications. In 2012, Time Magazine selected Prof. Loeb as one of the twenty-five most influential people in the study of space, and in 2020 Loeb was selected among the fourteen most inspiring Israelies of the last decade.

Glen Messer

Glen Messer, (Th.D., Boston University), is an Historian and Theologian of Wesleyan Methodist Traditions. He holds a Bachelor of Fine Arts from Eastern Michigan University, a Master of Divinity from Boston University, and a doctorate in the History of Christianity with emphasis on the history of Methodism and Pietism in the North Atlantic Basin, also from Boston University. His historical research centers around the relationships between religion and politics in late 18th and early 19th century America and the anti-slavery struggle during that time.

Dr. Messer is a passionate teacher. Whether teaching in a graduate school or teaching and tutoring students online, he is intrigued by how people learn and teach. He constantly experiments with pedagogy and aims to help people equip themselves for lifelong pursuits of learning and creative expression. He was Visiting Assistant Professor at Boston University where he taught History of Christianity of the Modern Period and Methodist Studies courses. At Yale Divinity School he taught Methodist Studies courses. He has also taught other short courses and online courses on a variety of subjects including literature and writing, and drawing and painting.

For half a dozen years, Dr. Messer served as an executive staff officer at the ecumenical and interfaith agency of The United Methodist Church, which during that time was located in Manhattan's Upper West Side. There, he worked as both a historian and theologian, was responsible for all denominational ecumenical dialogues with other Christian traditions, and also worked on interfaith relations. Representing The United Methodist Church, Dr. Messer served as a Commissioner on the Faith and Order Commission of the National Council of Churches of Christ in the USA. He also served for a time as a staff representative on the Interfaith Relations Commission of the same institution. As part of his work with the ecumenical agency, he authored *Perfecting Unity* (The Council of Bishops, 2016), which explores questions relating to Christian unity.

Ronald Nakasone

Ronald Y Nakasone (Ph.D., University of Wisconsin-Madison) is a proponent of the age-old East Asian literati tradition that encourages self-cultivation, self-transformation, and self-realization by means of scholarship, community involvement, and the arts. Professor Nakasone is a member of the Core Doctoral Faculty at the Graduate Theological Union (GTU) in Berkeley,

California. He was a faculty-consultant of Stanford University Geriatric Education Center for more than twenty years.

At the GTU, Prof. Nakasone offers courses on Buddhist doctrine and aesthetics and advises students. He served as the convener of the Cultural and Historical Studies and the Art and Religion Areas. At Stanford University, he plied his knowledge of Buddhism and East Asian culture and his experience as a Buddhist priest to research, write articles, and offer lectures and workshops to medical professionals, religious leaders, social workers, frontline caregivers, families, and volunteers on best practices to care for underserved older adults.

Prof. Nakasone has published four books and over 150 papers on Buddhist doctrine, ethics, and aesthetics, Spirituality and Aging, and Ryūkyūan (Okinawan) Studies. He is the author of *Mapping the Pathways of Huayen Buddhist Thinking: Its Origins, Unfolding, and Relevance* (Peter Lang, 2022). His first book, *Ethics of Enlightenment* (Dharma Cloud Publishers, 1990), reflects on the experience of Pure Land Buddhist thought and its living reality for its devotees. He edited *Okinawan Diaspora* (University of Hawai`i Press, 2002), a collection of chapters on the Okinawan immigrant experience in Hawai`i, Philippines, Peru, Japan, and the U.S. He also edited *The Transforming Spiritual Landscape: Buddhist-Christian Dialogue* (Dharma Cloud Publishers, 2005), which consists of reflections on interreligious dialogue in Thailand. He co-edited the two-volume *Asian Religious Cultures* (ABC-CLIO, 2015), a compendium of the Asian religious experience in America. He has written major articles on Buddhist views on bioethics for *Encyclopedia of Bioethics* (Macmillan, 1995) and *Encyclopedia of Ethical, Legal & Policy Issues in Biotechnology* (Wiley, 2000).is Students and colleagues contributed essays to *Memory and Imagination, Essays and Explorations in Buddhist Thought and Culture* (Nagata, 2010), a festschrift commemorating his completion of one life cycle according to the Chinese zodiac.

Rev. Nakasone regularly preaches to Buddhist devotees and conducts services at Okinawan community events.

Andrew Newberg

Andrew Newberg, (M.D., University of Pennsylvania), is Professor, Department of Integrative Medicine and Nutritional Sciences; Professor, Department of Radiology; and Research Director, Marcus Institute of Integrative Health, Thomas Jefferson University and Hospital. He is Board Certified in Internal Medicine and Nuclear Medicine. He has actively pursued a number of neuroimaging research projects which have included the study of aging and dementia, epilepsy, and other neurological and psychiatric disorders. Prof. Newberg has been particularly involved in the study of mystical and religious experiences, a field referred to as "neurotheology." He also has studied the more general mind/body relationship in both the clinical and research aspects of his career including pursuing research to understand the physiological correlates of acupuncture therapy, meditation, and other types of alternative therapies. He has published over 250 peer reviewed articles and chapters on brain function, brain imaging, and the study of religious and mystical experiences. He has published twelve books which have been translated into seventeen different languages. He was listed as one of the 30 Most Influential Neuroscientists Alive Today by the Online Psychology Degree Guide.

Prof. Newberg is the co-author of the bestselling books, *How God Changes Your Brain* (Ballantine, 2009) and *Why God Won't Go Away: Brain Science and the Biology of Belief* (Ballantine, 2001). He is also a co-author of *How Enlightenment Changes Your Brain: The New Science of Transformation* (Avery, 2016); *Words Can Change Your Brain* (Hudson Street Press, 2012); *Born to Believe: God, Science, and the Origin of Ordinary and Extraordinary Beliefs* (Free Press, 2006); and *The Rabbi's Brain: Mystics, Moderns, and the Science of Jewish Thinking* (Turner, 2018). He also is the author of several academic books including *Neurotheology: How Science Can Enlighten Us About Spirituality* (Columbia University Press, 2018) and *Principles of Neurotheology* (Ashgate, 2010), and he is co-author of *The Mystical Mind: Probing the Biology of Belief* (Fortress Press, 1999). The latter book received the 2000 award for Outstanding Books in Theology and the Natural Sciences presented by the Center for Theology and the Natural Sciences. Prof. Newberg also produced a video program consisting of twenty-four lectures entitled "The Spiritual Brain" for The Teaching Company. He has presented his work at scientific and religious meetings throughout the world and has appeared on the news and on numerous television programs.

Prof. Newberg has appeared in three movies, *What the Bleep Do We Know?*, *Religulous*, and *Awake: The Life of Yogananda*. His work has been featured in a number of major media articles including in *Newsweek*, *Time Magazine*, *National Geographic*, *Discover*, *The New York Times*, *O Magazine*, *Los Angeles Times*, *London Observer*, *Philadelphia Inquirer*, and *Reader's Digest*.

Ted Peters

Ted Peters, (Ph.D., University of Chicago), is an emeritus professor at the Graduate Theological Union (GTU), where he co-edits the journal, *Theology and Science* on behalf of the Center for Theology and the Natural Sciences (CTNS) in Berkeley, California. At CTNS, he directs discussion at the intersection of science, religion, and ethics.

Prof. Peters co-edited *Astrotheology: Science and Theology Meet Extraterrestrial Intelligence* (2018) and *Astrobiology: Science, Ethics, and Public Policy* (Wiley/Scrivener, 2021). He also is author of *UFOs: God's Chariots? Spirituality, Ancient Aliens, and Religious Yearnings in the Age of Extraterrestrials* (Career Press New Page Books, 2014).

Prof. Peters earned M.A. and Ph.D. degrees at the University of Chicago and an M.Div. at Trinity Lutheran Seminary. For four decades, Prof. Peters taught systematic theology as Distinguished Research Professor of Systematic Theology and Ethics at Pacific Lutheran Theological Seminary while also teaching at the GTU. Prof. Peters is the author or co-author of 330 peer reviewed scholarly articles and twenty books, and he is editor or co-editor of fourteen collections of essays. His work emphasizes 'Public Theology' and employs the method of theology of culture.

Prof. Peters served as Principal Investigator (PI) on a U.S. National Institutes of Health (NIH) grant to study the "Theological and Ethical Implications of the Human Genome Initiative." Subsequently, he served on the Ethics Advisory Board of the Geron Corporation and then on the Standards Working Group of the California Institute for Regenerative Medicine.

Carl Peterson

Carl Peterson (Ph.D., Ohio University), did his postdoc at The Ohio State University and served as a Lecturer during two of his three years there teaching chemistry for science students. He also worked as a Consultant at Battelle Memorial Institute providing mathematical services for special projects during his last year at Ohio State.

Afterwards, Dr. Peterson went to Ohio Wesleyan University as a Visiting Professor of Chemistry and as an Adjunct Professor of Physics. Over a seventeen year period there, he periodically taught a number of courses, such as quantum chemistry and quantum physics. After four years at Ohio Wesleyan, Dr. Peterson's stay was interrupted with a two-year stint in governmental work for the Ohio Environmental Protection Agency in Columbus, Ohio and a three-year foray into industry at Owens Corning Fiberglass Corporation in Toledo, Ohio. Upon returning to Ohio Wesleyan University as an Adjunct Professor of Physics for thirteen more years, Dr. Peterson taught quantum physics, calculus, and electricity and magnetism. He also supervised independent study and honors students. Dr. Peterson remained at Ohio Wesleyan University as an Adjunct while obtaining a position as a Visiting Professor of Chemistry at the University of Cincinnati teaching chemistry for science majors and another position at Columbus State Community College, in Columbus, Ohio teaching physics. Dr. Peterson also was a full-time Associate Professor at Columbus State University for three years. He has published on the electronic structure of polyatomic molecules.

After working in academia, Dr. Peterson became an entrepreneur with more than 250 employees. At that time, he decided to become an independent scholar with the primary purpose of breaking the hegemony of the Copenhagen interpretation of quantum mechanics and advocating instead for David Bohm’s ontological interpretation of quantum mechanics.

Michael J. Reiss

Michael J. Reiss (Ph.D., University of Cambridge) is Professor of Science Education at UCL (University College London) Institute of Education, Visiting Professor at the Royal Veterinary College, Honorary Fellow of the British Science Association and of the College of Teachers, a Fellow of the Academy of Social Sciences, and a Priest in the Church of England. He is President of the International Society for Science and Religion (ISSR) and of the International Association for Science and Religion in Schools, a

member of the Nuffield Council on Bioethics, and the former Director of Education at the Royal Society.

Prof. Reiss went to university intending to become a theoretical physicist but soon switched to biology. He did his Ph.D. and postdoc in evolutionary biology and population genetics, then trained to be a teacher and taught in schools for five years. He then returned to higher education where he worked in initial teacher education at primary and secondary levels for twelve years before moving to UCL, where most of his teaching is now with doctoral students and where he undertakes research in science education, sex education, and bioethics.

Prof. Reiss is author of *Understanding Science Lessons: Five Years of Science Teaching* (Open University Press, 2000) and *Science Education for a Pluralist Society* (Open University Press, 1993), and he is co-author of *Human Flourishing: Scientific Insight and Spiritual Wisdom in Uncertain Times* (Oxford University Press, 2021), *Cognitive and Metacognitive Problem-Solving Strategies in Post-16 Physics* (Springer, 2019), *Islam and Health Policies Related to HIV Prevention in Malaysia* (Springer, 2018); *An Aims-based Curriculum: The significance of human flourishing for schools* (IOE Press, 2013), *Values in Sex Education: From Principles to Practice* (RoutledgeFalmer, 2003), and *Improving Nature? The Science and Ethics of Genetic Engineering* (Cambridge University Press. 1996).

Konrad Szocik

Konrad Szocik, (Ph.D., Jagiellonian University, Faculty of Philosophy, Poland), is an Assistant Professor in the Department of Social Sciences, University of Information Technology and Management in Rzeszow, Poland, where he also is a member of the Research Ethics Committee. He also is the Rector's plenipotentiary for the prevention of bullying, discrimination, and violence. In the academic year 2021-2022, Prof. Szocik is a Visiting Scholar at the Interdisciplinary Center for Bioethics at Yale University.

Prof. Szocik is an editor for the journal *Studia Humana* published by De Gruyter. He also is the author of two monographs in Polish, a co-author of *Revising Cognitive and Evolutionary Science of Religion. Religion as an Adaptation* (Springer, 2021), editor of two books published in Springer's Space and Society series, *The Human Factor in a Mission to Mars. An Interdisciplinary Approach* (Springer, 2019) and *Human Enhancements for Space Missions. Lunar, Martian, and Future Missions to the Outer Planets*

(Springer, 2020), and co-editor of *The Human Factor in the Settlement of the Moon. An Interdisciplinary Approach* (Springer 2021).

Prof. Szocik is the author of more than one hundred scientific articles, more than forty of which address space missions and human space exploration primarily from ethical and social perspectives. Currently, he is completing a monograph on the feminist bioethics of space exploration (Oxford University Press, 2022).

Prof. Szocik has published in journals including *Science*, *Bioethics*, *Acta Astronautica*, *International Journal of Astrobiology*, *Space Policy*, *Futures*, *Technological Forecasting and Social Change*, *Technology in Society*, *Science and Engineering Ethics*, *The New Bioethics*, *Journal of the British Interplanetary Society*, *Spaceflight*, *Theoretical Issues in Ergonomics Science*, *Cambridge Quarterly of Healthcare Ethics*, *Astropolitics*, *Zygon: Journal of Religion and Science*, *Theology and Science*, *Archive for the Psychology of Religion*, *Method and Theory in the Study of Religion*, *AI in Society*, *Sage Open*, *Current Anthropology*, *The Heythrop Journal: A Quarterly Review of Philosophy and Theology*, *Social Evolution and History*, *Numen*.

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Massimo Teodorani

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Dr. Teodorani takes an observational/experimental and interpretative/theoretical approach to his research. He also is an expert in the physics of anomalous plasma phenomena of geophysical interest such as the phenomenon in Hessdalen, Norway and similar recurrent phenomena around the world. On these topics, he has carried out considerable research using astronomy-like strategies and observational techniques and simultaneous multiwavelength and multi-instrument measurements, and he has published his observational and theoretical research. He presently is working on new instrument strategies in this field.

Dr. Teodorani recently taught physics at the Bologna University, and he is a well-known science communicator in Italy and around the world regarding subjects such as astrophysics, quantum physics, and anomalistics. He is the author of eighteen science-oriented books including two textbooks, *L'Atomo e le Particelle Elementari – Manuale per Studenti e Ricercatori* (Macro Edizioni, 2007) and *Raccontare l'Universo – Introduzione Divulgativa all'Astrofisica* (Tangram Edizioni Scientifiche, 2020).

PART I:

PHILOSOPHICAL AND SCIENTIFIC PERSPECTIVES

CHAPTER ONE

CARTOGRAPHIES OF KNOWLEDGE AND ACADEMIC MAPS

JENSINE ANDRESEN

Maps are amazing things—they tell us where we have been, where we are now, and where we may decide to go in the future. Human beings accord incredible importance to maps, often using them to organize significant trajectories in their lives.

The current consensus and mostly Western cartography of human knowledge is laid out like a map in the organization of disciplines in the academy. Here, I use the word "knowledge" in its colloquial sense of facts accumulated over time pertaining to a particular domain or field of intellectual inquiry. Setting aside for the moment local knowledge, the map of major academic disciplines is extremely consistent across world, even when political ideologies, geopolitical agendas, and languages are not the least bit consistent between countries or even within them.

The world over, all major academic institutions have a department of physics, for example, and departments of chemistry, biology, and mathematics. Consistency in the demarcation of academic disciplines is not merely present in the natural sciences, either. It also exists in the social sciences, which are organized across the globe into disciplines such as psychology, sociology, economics, political science, etc. Even the humanities are relatively consistent worldwide, with departments of history, philosophy, religion, aesthetic theory, etc. This of course means that the same tripartite scheme of natural sciences, social sciences, and the humanities functions as the consistent organizing principle for knowledge across cultures, even when political and linguistic systems differ considerably.

In fact, the map of academic disciplines is so consistent across the globe that we tend to take the current organization of knowledge for granted. Noticing this consistency, human beings may be tempted to pat themselves on the back, as if consistency in the organization of disciplines in the academy means that human beings have 'gotten it right'—i.e., that they

have uncovered something fundamental about how the world works and the nature of reality itself—and, beyond this, that they have organized academic disciplines as a reflection of this fundamental order. But have we 'gotten it right?' Perhaps a little bit, but certainly not entirely.

While the map of academic disciplines human beings possess now reflects the cartography of knowledge as we best understand it at this moment in human history, this map has not been particularly helpful in assisting human beings navigate the practicalities of existence here on Earth. The high level of strife in human society and how poorly human beings manage Earth's resources are two clear signs that the human cartography of knowledge has major shortcomings and that the map of academic disciplines needs to be redrawn. This is an urgent issue, since humankind is facing challenges that are both global in nature, and, also, existential—hunger and starvation; war and war profiteering; mass human migrations; refugee crises; the rise of authoritarianism; climate change; species extinction; loss of biodiversity; pandemics; desertification; potential asteroid and comet impacts; potential polar shifts; financialization of the global economy; the global debt bubble; enormous disparities in wealth; unequal access to resources; human trafficking; violent crime; and numerous, potential societal collapsology trajectories that could cause human society to descend into widespread chaos and mayhem.

We often blame poor outcomes in the abovementioned areas on deficiencies in our political and governance systems, on conflict between countries, and/or on the exigencies of global and regional power structures. The real problem lies at a much deeper level, however. Shortcomings and often outright failings in how we relate to one another, govern ourselves, and distribute resources result from errors in how we create, organize, and transmit knowledge. These errors then emerge as deficiencies in the institutions and power structures that organize human society.

A maladaptive feedback loop exists between poor knowledge management and poor governance decisions. Ongoing strife and poor resource management both result from how humankind creates, organizes, analyzes, and transmits knowledge. When human beings are socialized by the educational system, media, and social media into perceiving reality in ways that are incomplete and/or inaccurate, these misperceptions play out in government and policymaking, thereby demonstrating the real-world consequences of misunderstandings regarding the nature of reality. Deficiencies in the human educational system and other mechanisms of knowledge dissemination feed directly into the organization of and decisions made in human governance systems. A feedback loop then ensues, in which errors at the level of government and policymaking feed right back

into the educational system when policymakers decide to allocate government funding to support one line of research over another. Humankind's inability to address climate change demonstrates precisely this type of dysfunctional dynamic. Put bluntly, policymakers are the product of the educational system, and many of the policymakers in human society have graduated from the most elite universities on the planet. If their policies don't work—and they don't—then we must redress the educational system itself instead of spending so much time blaming the individuals who make maladaptive decisions.

To improve life on Earth, then, we must address deficiencies at the level of knowledge rather than merely responding ad hoc to one crisis after another. This means that we must problematize knowledge creation, organization, analysis, and transmission if we want to get anything useful, moral, and meaningful done here on Earth—and, also, if we want to join other species responsibly in space. Perhaps as a good initial step, we should think about creating academies that specialize in finding solutions to specific global challenges rather than socializing people into one discipline versus another.

More or less two decades ago, academics began to come to grips with the shortcomings of their map of academic disciplines. During this period in recent intellectual history, many academics embarked upon the path of interdisciplinarity, with some universities also creating interdisciplinary programs institutionally. Although the underlying motivation was good, the results of so-called interdisciplinary research have been very modest. The false hope that interdisciplinarity alone would forge a path to better educational outcomes hit hard against the wall of methodological incongruities between disciplines—and, also, against rigid entrenchment relating to how disciplines were classified into categories such as science and the humanities. Accordingly, interdisciplinary discourse often was impeded because people started from different premises and spoke different methodological languages. Making the situation worse, no tangible incentives existed in the academy to learn methodological approaches outside of those prepotent in one's own discipline, so many scholars simply retreated from interdisciplinary venues to continue to conduct research and to build their careers in their own core disciplines.

Certainly, it goes without saying that if human beings do not perceive reality correctly—or even well—then their responses to the actual reality in which they are immersed will be maladaptive. To become *adaptive*, human beings must perceive and interpret reality accurately and they must adjust their own cognitive and emotional responses accordingly. To ensure that fundamental misperceptions do not reverberate and become amplified in the

human knowledge-action system as a whole, human beings therefore must create the very best cartography of knowledge and corresponding map of academic disciplines that they can. Perceiving reality well and forming our cartographies of knowledge and academic maps correspondingly well will help human beings survive. It also will promote growth in human consciousness so that human beings experience more meaning, joy, and love.

Although reviewing the intellectual history of each country and region of the world would reveal how, when, and why standardization of academic disciplines has occurred, the international group of contributors represented in this volume focus instead on the very existence and implications of such standardization. More specifically, these scholars consider the implications of widespread Contact with an advanced extraterrestrial intelligence (ETI) for the current cartography of human knowledge and map of academic disciplines. Here, I capitalize "Contact" to indicate widespread Contact over essentially the entire human species.

Official acknowledgment that unidentified aerial phenomena (UAP) are real underscores the timeliness and relevance of the considerations described above. It also provides impetus for academics to start thinking cogently about the topic of human knowledge in the context of a broader discussion of *extraterrestrial* intelligence. How will widespread Contact impact so-called core disciplines, such as physics, mathematics, chemistry, biology, history, etc.? Will such core disciplines begin to merge? How will widespread Contact impact the organizational map of academic disciplines as a whole? Will boundaries between academic disciplines become more fluid? Will the categorization of disciplines into the natural sciences, social sciences, and humanities be replaced by something new? Even further, will entire categories of knowledge, e.g., religion and science, find a common ontological ground?

Asking how widespread Contact will impact academia and, indeed, all of human society, is useful pragmatically, since it will help people prepare for this eventuality if and when it occurs. How will human knowledge creation, organization, analysis, and transmission change as creative acculturation with ETI unfolds? These and similar questions suggest meta questions, too, such as whether human beings are losing the forest for the trees when they specialize in increasingly more granular disciplines and subdisciplines in the academy. Is ever more analytical parsing of reality useful, or not? Does such excessive analysis distract us from the deeper reaches of intuition, knowledge, insight, and wisdom that are the real qualities that imbue existence with meaning?

Instead of constant enculturation in granular and standardized disciplines and subdisciplines, it makes sense to set aside some time for intellectual off-roading. This requires taking our minds off prescribed, academic roadways to explore regions not yet mapped. Indeed, maybe such regions never should be mapped, since any lines artificially imposed on *any* terrain impede human beings from seeing how things interrelate, thereby obscuring the manner in which all aspects of reality cohere together in a meaningful way to form a whole.

At the end of the day, political regimes will come and go, governments will rise and fall, and, barring a singularly catastrophic disaster and/or series of chaotic events with devastating consequences—such as a full-blown nuclear exchange—human beings will continue to exist. But, by stopping to consider just how advanced the ETI in our midst right now actually is, and by asking ourselves how this advanced ETI perceives reality and processes information, human beings will begin to understand reality much more clearly themselves. This will improve human knowledge creation, organization, assimilation, and transmission, and it will help human beings adapt more successfully to their environment.

Given the significance of the relationship between ETI and humankind for all aspects of human society, including the connection between academia and civil society, discussions of ETI and UAP are both timely and important. These topics will be discussed more widely as humankind assimilates a more expansive understanding of its place in the Cosmos.