Press Release

July 20, 2022

The Winner of the 2022 (29th) International Cosmos Prize is:

Dr. Felicia Keesing

Professor of Biology , Bard College

Dr. Keesing clarified the relationship between the biodiversity of natural ecosystems and the risk that zoonotic pathogens may be transmitted to human society through her practical research, and provided scientific suggestions for thinking about what The Harmonious Coexistence between Nature and Humankind should be like in the post-COVID-19 era.

On July 20, 2022, The Commemorative Foundation for the International Garden and Greenery Exposition, Osaka, Japan, 1990 (Expo '90 Foundation) (Chairperson: Mr. MITARAI Fujio) selected Dr. Felicia Keesing (56), Professor of Biology at the Bard College, as the winner of the 2022 (29th) International Cosmos Prize. The decision to award the prize to Dr. Felicia Keesing was reached after considering the recommendations submitted by the International Cosmos Prize Committee (Chairperson: Dr. OIKE Kazuo) and the Screening Committee of Experts (Chairperson: Dr. SHIRAYAMA Yoshihisa).

Dr. Felicia Keesing clarified the relationship between biodiversity and the risk of zoonotic pathogen transmission by conducting practical research and studies. She has demonstrated that while ecosystems with high biodiversity can be a breeding ground of various pathogens, the overall infection risk can be reduced in these ecosystems due to the presence of a dilution effect, thereby proving that biodiversity is of critical value to human society.
These research achievements are instrumental in exploring the interrelationships among all life forms and provide sensible suggestions for seeking the ideal state of “Harmonious Coexistence between Nature and Humankind” in the post-COVID-19 era.
The award ceremony will be held in Osaka in the autumn this year.

The photo is at the following URL:

https://www.expo-cosmos.or.jp/main/cosmos/2022photo.html

1. Focus and scope of research to be awarded

The prize will be awarded for research and work that has achieved excellence and is recognized as contributing to a significant understanding of the relationships among living organisms, the interdependence of life and the global environment, and the common nature integrating these interrelationships. It should be characterized by a global perspective which tries to illuminate the relationships between diverse phenomena, in keeping with the concepts and principle of "The Harmonious Coexisetence between Nature and Mankind."

The following points will be the standards by which the achievements will be evaluated.

(1)The body of achievements should show an inclusive and integrated methodology and approach, in contrast to analytic and reductive methodologies.

(2)The achievements must be based on a global perspective. If the focus is on a particular phenomenon or specific area, it must have universal significance and applicability.

(3)The achievements should offer a long-term vision which leads to further developments, rather than solutions to limited problems.

2. Selection Process

(1) Selection Process

The International Cosmos Prize Screening Committee of Experts met four times between April and June of 2022 in order to evaluate candidates for the prize. After careful deliberations, the winner was selected at the International Cosmos Prize Committee on June 27.

(2) 2022 International Cosmos Prize Nominees

174 nominations (from 28 countries)

＜Breakdown by Year＞

Candidates since 2019: 58　Candidates since 2020: 45

Candidates since 2021: 34　Candidates since 2022: 37

＜Breakdown by Country＞

Japan (56), the United States (41), the United Kingdom (14), Germany (12),Australia (5) Canada (4), Brazil(4), Spain(3), Belgium(3), South Korea(3) ,Thailand(3) ,Slovakia(2) Switzerland(2), India(2) , Indonesia(2),Singapore(2),China(2), the Netherlands(2)Chile(2) Kenya(2),the Philippines(1),Israel(1),Argentina(1),Ireland(1),Kyrgyz Republic(1) Hungary(1) Republic of Tunisia(1), South Africa(1)

Others:

(1) Award ceremony

The award ceremony will be held at Sumitomolife Izumi Hall in Chuo-ku, Osaka, on Friday, November 9, 2022.

(2) Others

The prizewinner shall be awarded a certificate of merit, a medallion, and a monetary prize of 40 million yen.

Attached documents:

・Curriculum Vitae　・Reason for Awarding the Prize
・Comments (on receiving the Prize) by the prizewinner　・Prizewinners 1993-2021
・The International Cosmos Prize Committee, the Screening Committee of Experts

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Curriculum Vitae

Name: Felicia Keesing

Date of Birth: 24 January 1966, Santa Cruz, California, USA

Nationality: USA

Current Position: Professor of Biology , Bard College

Professional Preparation:

1987	B.Sc., Stanford University
1997	Ph.D. in Integrative Biology, University of California at Berkeley

Appointments:

1997-2000	Assistant Professor of Biology, Siena College
2000-2003	Assistant Professor of Biology, Bard College
2003-2012	Associate Professor of Biology, Bard College
2012-now	Current Position

Select books:

Richard S. Ostfeld, Felicia Keesing, and Valerie T. Eviner eds. 2008, *Infectious Disease Ecology: Effects of Ecosystems on Disease and of Disease on Ecosystems*, Princeton Univ Pr

Reasons for the Award

Dr. Felicia Keesing is an ecologist who has studied the relationship between the biodiversity of species that comprise a natural ecosystem and the risk that zoonotic pathogens residing in the ecosystem may be transmitted to human society, based on findings of research studies implemented in a variety of fields.

The recent global pandemic of the novel coronavirus (COVID-19) has brought unprecedented chaos to human society, tremendously impacting our lives and the economy. Having experienced this health crisis on a global scale, we have come to realize the necessity of radically reconsidering the ideal state of the relationship between humans and wildlife. However, Dr. Keesing has pointed out since early on that the threats of emerging and re-emerging infectious diseases will rise if species diversity declines in natural ecosystems.

To explore the relationship between biodiversity conservation and the spread of zoonotic pathogens, Dr. Keesing has conducted field studies in African savanna regions and the northeastern United States, including New York State, as well as pursuing experimental research in the laboratory. By continuing these activities over a long period of time, she has clarified the aforementioned relationship, even taking into account ecological mechanisms of interspecific pathogen transmission. She has positively demonstrated that while ecosystems with high species diversity can be a breeding ground of various pathogens, the overall risk of infection transmission to humans and other non-natural host species often decreases in these ecosystems, due to the presence of many species that are resistant to infection with certain pathogens. This is because the growth and spread of these pathogens is inhibited, causing their density to remain low (diluted). In addition, she has shown that when humans enter a natural ecosystem, generally the number of large mammals will decline, leading to an increase in the population density of small mammals (rodents, Carnivora, etc.), and that, since these animals serve as abundant hosts for zoonoses, the rate of zoonotic transmission to humans will increase.

Thus far, Dr. Keesing has consistently insisted that there is no single universal method for defining the scope of biodiversity to be conserved and determining its univocal efficacy. Rather than seeking such a single solution, she believes that researchers should meticulously investigate the complex relationships between multiple factors—such as the infection mechanisms, habitat characteristics, and ecological affinity of pathogens. She holds the opinion that only by doing so can they find a solution based on a new perspective and scientific rigor, in order to answer the question, “Why do we need to conserve biodiversity?” in a manner that is tailored to individual regions.

Meanwhile, she has been vigorously working to promote “open science,” which allows experts and non-experts alike to more easily access scientific papers and data on research findings. Furthermore, together with her colleagues, Dr. Keesing has formed a network to provide education to young researchers, ranging from junior and senior high school students to college undergraduates and graduates. Such interactions between Dr. Keesing and students as well as ordinary citizens are of great social significance.

The series of research results achieved by Dr. Keesing are based on an interdisciplinary approach that includes the fields of ecology, public health, and other disciplines, and the results and her methods are in accord with the purpose of the International Cosmos Prize, which seeks to illuminate the interrelationships among all life forms. These achievements are also extremely meaningful in charting the future course toward realizing “Harmonious Coexistence between Nature and Humankind,” and are expected to provide profound suggestions for the establishment of the “New Normal,” which is required in the post-COVID-19 era.

As stated above, her outstanding accomplishments make Dr. Felicia Keesing truly deserving of being a laureate of the International Cosmos Prize.

Comment by the prizewinner

I am honored to receive the International Cosmos Prize for 2022. The purpose of this prize and the activities of the EXPO 90 Foundation focus on the harmonious coexistence of humanity and the natural world. I can imagine no more important topic.

I am in many ways an unlikely recipient of this prize. I came to the study of biology comparatively late, and I did not intend to spend my life doing research, even when I was in graduate school. Further, I have spent my career at a small college rather than a big university. But these unusual circumstances have also been a great benefit. Working closely with undergraduate students has been an ongoing source of inspiration. Perhaps most importantly, as I watch my students, and my children, grapple with the realities of the world they are inheriting, I am acutely aware of the stakes of the choices we are making.

I gained my first real immersion in scientific research studying how Kenyan savannas function when large charismatic mammals – like zebras, elephants, and giraffes – are gone. That work revealed that in the absence of large mammals, small mammals like rodents become much more abundant, leading to other impacts. For example, abundant rodents can consume entire cohorts of baby Acacia trees, leading to potential desertification. Rodents also attract venomous snakes, and harbor fleas that can transmit diseases to people. This work showed some of the ways that people living in savannas benefit from large mammals. Since then, my Kenyan and American collaborators and I have identified environmental, economic, and social benefits that can accrue when people, livestock, and wildlife share the same landscapes.

In the United States, my colleagues and I have studied how biodiversity affects the emergence and transmission of pathogens, particularly pathogens that cause diseases in humans. Our work on Lyme disease, a common vector-borne disease of people in many parts of the world, has shown that the ticks that transmit the Lyme pathogen to people are less likely to be dangerous if they come from a habitat with high biodiversity. This occurs because the animals most likely to infect ticks thrive when biodiversity declines. High natural biodiversity, then, is protecting us from infection because the presence of diversity dilutes the impact of dangerous species that thrive when diversity declines. Dilution effects like these are now known to occur for many diseases of humans, wildlife, and plants, and they provide a tangible and immediate benefit arising from the conservation of biodiversity.

The past few years have made links between biodiversity and disease more relevant than ever before, as our planet's human population grapples with the ongoing ravages of the COVID-19 pandemic. The world we have spent decades creating – a world dominated by human habitats with little room for nature – is also a world in which the species most likely to transmit pathogens to us are surging, while those most likely to protect us from pathogens are going extinct. In my country, we have also seen how misinformation -- about masks and vaccines and treatments – can disrupt not only our ability to prevent infections, but the very social and civic fabric of our country itself. Recognizing these links between civic engagement and science, my colleagues at Bard College and I are pioneering new ways of teaching science literacy, particularly to college students. The stakes are high.

In a hopeful way, I choose to remember that the early months of the pandemic showed us how readily we could change our behavior when we needed to, and just how much innovation was possible and how quickly.

I am so grateful to receive the Cosmos Prize. I will spend the rest of my career in pursuit of its spirit.

PRIZEWINNERS 1993-2021

1993 Sir Ghillean Prance

Director, Royal Botanic Gardens, Kew, U.K.

An authority on tropical plants centering on those of the Amazon basin of South America, Dr. Prance advocates his Flora-on-the-Earth Project to establish a comprehensive record of the earth's vegetation in the form of a database.

1994 Dr. Jacques François Barrau (deceased)

Professor, Paris National Museum of Natural History, France

Dr. Barrau has conducted ethnobiological studies on nature and the life styles of people in the Pacific Ocean. His results have afforded unique insights into the relationship between human beings and food from a global perspective.

1995 Dr. KIRA Tatuo (deceased)

Professor Emeritus, Osaka City University, Japan

On the basis of his quantitative research on plants' organic production, Dr. Kira has established "Production Ecology". He has also played a leading role in conducting field studies of the ecosystem in tropical rainforests in Southeast Asia.

1996 Dr. George Beals Schaller

Director of Science, the Wildlife Conservation Society, U.S.A.

Dr. Schaller has been conducting field research on the ecology and behavior of various wild animals in all parts of the world, and has written many books including "The Mountain Gorilla" and "The Last Panda."

1997 Dr. Richard Dawkins

Professor, Oxford University, U.K.

Dr. Dawkins totally reversed the conventional view of biology with a bold hypothesis he put forward in his 1976 book. He continues to present new views.

1998 Dr. Jared Mason Diamond

Professor, University of California at Los Angeles, U.S.A.

Dr. Diamond has made remarkable achievements in physiology. He has been organizing field expeditions to New Guinea and has employed the results of this fieldwork to restructure his unique studies of the evolution of human societies.

1999 Dr. Wu Zheng-Yi (deceased)

Professor and Director Emeritus, Kunming Institute of Botany, Chinese Academy of Sciences, China

Dr. Wu is a representative botanist of China. He edited "Flora of China" which describes all known plant species in China.

2000 Sir David Attenborough

Producer, Naturalist, Zoologist, U.K.

Sir David is a pioneer of wildlife documentary films. With his excellent films of various creatures or plants, he has told many people throughout the world about the nature of life for more than fifty years since joined the BBC.

2001 Prof. Anne Whiston Spirn

Professor, Massachusetts Institute of Technology, U.S.A.

Based on the principle, "Cities must not conflict with nature, it is possible to build cities that exists as part of nature", she proposes measures to develop cities while maintaining harmony with nature.

2002 The Charles Darwin Research Station

The Charles Darwin Research Station is a biological research center established in 1964 by the international NGO/NPO Charles Darwin Foundation in the Galapagos Islands of Ecuador.
The Station has made remarkable achievement in research and protection of the numerous indigenous species of the Island, including elephant tortoises and marine iguanas.

2003 Dr. Peter Hamilton Raven

Director, Missouri Botanical Garden, U.S.A.
Dr. Raven is a representative botanist of the U.S., and international pioneer in advocating for the conservation of global biodiversity. He has given his approach toward issues concerning life on earth from a global viewpoint and his significant contributions toward promoting the co-existence of nature and human beings in both academic and practical terms.

2004 Prof. Julia Carabias Lillo

Professor, National Autonomous University of Mexico, Mexico
Professor Carabias has always considered global environmental issues from the perspective of developing countries. She has achieved excellent results in resolving difficult challenges under different conditions, through the implementation of programs based on thorough fieldwork with a multidisciplinary approach.

2005 Dr. Daniel Pauly

Professor and Director, Fisheries Centre, University of British Columbia, Canada
Pursuing his comprehensive studies of the relationship between fishing and marine ecosystem, Dr. Pauly has made outstanding achievements in the field of research into marine ecosystems and resources, including the development of scientific models to enable both marine ecosystem conservation and sustainable resource use of fisheries.

2006 Dr. Raman Sukumar

Professor, Centre for Ecological Sciences, Indian Institute of Science, India
A strong advocate of preserving biodiversity and the environment, Dr.Sukumar has done pioneering research on the ecological relationship between elephants and humans, and on resolving the conflict between them, making him an internationally recognized expert on the coexistence of wildlife and humans.

2007 Dr. Georgina Mary Mace (deceased)

Professor of Conservation Science and Director of NERC Centre for Population Biology, Imperial College, London, U.K.
Dr.Mace played a significant role in the creation of scientific criteria for the identification and classification of threatened species. She has also contributed to the conservation of species and biodiversity.

2008 Dr. Phan Nguyen Hong

Professor Emeritus, Hanoi National University of Education, Vietnam
Dr. Phan has been involved in comprehensive scientific research in Vietnam, where war and overdevelopment have had a devastating impact on its mangrove ecosystem. He has made a major contribution to the restoration of the mangrove forests.

2009 Dr. Gretchen Cara Daily

Professor, Stanford University, U.S.A.
Dr. Daily has provided us with a comprehensive picture of the value of biodiversity-based ecosystem services, upon which human society is dependent. She has made a vital contribution to international initiatives such as the U.N. Millennium Ecosystem Assessment, and played a leading role in launching the "Natural Capital Project," which is a result of the fusion of ecology and economics, in order to promote the sustainable utilization of natural capital.

2010 Dr. Estella Bergere Leopold

Professor Emeritus, University of Washington, U.S.A.

Dr. Leopold has made tremendous achievements by continuing and further developing the Land Ethic, which was initiated by her father, Aldo Leopold (1887-1948), as well as by disseminating the idea to many places in the United States. She is still pursuing activities that weave the Land Ethic into the fabric of people's lives and society.

2011 Scientific Steering Committee of the Census of Marine Life

The Scientific Steering Committee of the Census of Marine Life provided overall governance to the Census, a grand global project. The objective of the Census was to survey and analyze changes from past to present in marine life biodiversity, distribution and abundance, and to compile the resultant data into a comprehensive database called the "Ocean Biogeographic Information System" to be used in forecasting the future of marine life.

2012 Dr. Edward Osborne Wilson(deceased)

Pellegrino University Research Professor ,Emeritus, Harvard University, U.S.A.

Dr. Wilson has accomplished outstanding achievements in his research into the natural history of ants and ethology. He has focused his scientific perspective and experience on helping to illuminate the human circumstance, including human origins, human nature and human interactions. Dr. Wilson has also been active in practicing biodiversity conservation and environmental education.

2013 Dr. Robert Treat Paine (deceased)

Professor emeritus of Zoology, University of Washington, U.S.A.

Dr. Paine has demonstrated, through explicit field experiments, that predators play essential roles in the stable maintenance of biotic communities. He proposed the concept of the keystone species, which plays a crucial role in maintaining the structure of an ecological community. He has had great impact not only on ecology, but also on conservation biology, as well as on the general public's understanding of biodiversity.

2014 Dr. Philippe Descola

Professor, the Collège de France, France

Dr. Descola, a distinguished anthropologist, has conducted rigorous fieldwork among the indigenous Achuar people living in Amazonia, South America, highlighting their view of nature and activities in interacting with the natural environment. On the basis of his findings, Dr. Descola has developed a philosophical concept and proposed the "anthropology of nature," which considers nature and culture in an integrated manner.

2015 Dr. Johan Rockström

Executive Derector, Stockholm Resilience Center, Sweden

Dr. Rockström cautioned that we have reached a saturation point in terms of human pressures on the Earth. System, and that if we let these anthropogenic pressures continue increasing to cross the thresholds or tipping points defined as "planetary boundaries," there is a risk of irreversible and abrupt environmental change.

2016 Dr. IWATSUKI Kunio

Professor Emeritus, Tokyo University, Japan

Dr. Iwatsuki has continually pursued the goal of biodiversity, and developed plant systematics in an inclusive and multifaceted manner, by adopting not only traditional methodologies but also molecular phylogenetic techniques. He advocated the importance of an integrated understanding of biological classification including phylogenetic systematics. Dr. Iwatsuki has also clarified that this approach is the essential principle which supports the abundance of life forms and harmonious coexistence between people and nature.

2017 Dr. Jane Goodall

Founder, Jane Goodall Institute, UK

Dr. Goodall has been studying wild chimpanzees since 1960 so as to paint a fuller picture of chimpanzees. She has conducted afforestation programs to provide habitats for chimpanzees, and an environmental educational project. She began Roots & Shoots, environmental learning program by young people. More than 150,000 groups are actively working in 99 countries under this program.

2018 Dr. Augustin Berque

Director of studies at the EHESS (École des Hautes Études en Sciences Sociales), France

Profoundly inspired by Fūdo, authored by the Japanese philosopher Tetsurō Watsuji, and by further elaborating, deepening and evolving Watsuji's concept of Fūdo, Dr. Berque organized his own thinking about landscapes and scenery, so as to develop a new academic discipline called "mésologie." Moreover, based on the theoretical results of mésologie, he proposed a theory about the subjecthood of nature, which holds that nature has subjectivity, while critically overcoming anthropocentrism in the nature-culture dualism and environmental ethics.

2019 Prof. Stuart L. Pimm

Doris Duke Professor of Conservation Ecology Nicholas School of the Environment and Earth Science, Duke University, U.S.A.

Professor Stuart L. Pimm has established the theoretical basis for understanding the complexities of food webs, the speed of species extinction and other such factors critical to the conservation of ecological habitats worldwide. He has established the non-profit foundation to take this work on conservation science into practical application in the field by supporting local groups in their habitat conservation activities and directing biodiversity conservation policy formulation based on scientific foundations. Prof. Pimm's contributions through this marriage of theory and practice in the field of habitat and species preservation are most impressive.

2021 Dr. Peter Bellwood

Emeritus Professor, Australian National University, Australia

He proposes the "early farming dispersal hypothesis" based on interdisciplinary research in archaeology, linguistics, and human physiology clarifying the agricultural origins and the process of early famers' migration and dispersal. At the same time, through this research, he has investigated the history of "The Harmonious Coexistence between Nature and Humankind", from a holistic perspective.

The International Cosmos Prize Committee

2022.4

Position	Name	Specialty	Official Title
Chairperson	Dr. OIKE Kazuo	Geoscience	President, University of Shizuoka
Vice Chairperson	Dr. YAMAGIWA Juichi	Anthropology, Primatology	Director General, Research Institute for Humanity and Nature
Member	Dr. AKIMICHI Tomoya	Ecological anthropology, Ethno-biology	Director General, Fujisan World Heritage Center
Member	Dr. ASASHIMA Makoto	Developmental biology	Research Professor, Teikyo University
Member	Dr. IKEUCHI Satoru	Astronomy	Professor Emeritus, The Graduate University for Advanced Studies
Member	Dr. SHIRAYAMA Yoshihisa	Marine biology	Professor Emeritus, Kyoto University
Member	Dr. TAKEUCHI Kazuhiko	Landscape and environmental science	President, Institute for Global Environmental Strategies
Member	Dr. NAKANISHI Tomoko	Radioplant physiology	President, Hoshi University
Member	Dr. NISHIZAWA Naoko	Plant molecular biology	President, Ishikawa Prefectural University
Member	Dr. HAYASHI Yoshihiro	Animal science and resource	Professor Emeritus, The University of Tokyo
Member	Dr. WASHITANI Izumi	Ecology, Conservation ecology	Professor Emeritus, The University of Tokyo
Member	Dr. WADA Eitaro	Biogeochemistry	Professor Emeritus, Kyoto University

Position	Name	Specialty	Official Title
Advisor	Dr. IWATSUKI Kunio	Systematic botany	Professor Emeritus, The University of Tokyo
Advisor	Dr. KISHIMOTO Tadamitsu	Immunology	Project Professor, Immunology Frontier Research Center , Osaka University
Advisor	Dr. NAKAMURA Keiko	Biohistory	Honorary Director, Biohistory Research Hall

The International Cosmos Prize Screening Committee of Experts

2022.4

Position	Name	Specialty	Official Title
Chairperson	Dr. SHIRAYAMA Yoshihisa	Marine biology	Professor Emeritus, Kyoto University
Vice Chairperson	Dr. IKEYA Kazunobu	Environmental anthropology	Professor, National Museum of Ethnology
Member	Dr. IKEBE Konomi	Landscape and Environmental science	Professor, Graduate School　Environmental Science and Landscape, Chiba University
Member	Dr. Monte Cassim	Environmental science	President, Graduate School of Leadership and Innovation, Shizenkan University
Member	Dr. KAMEZAKI Naoki	Animal ecology	Professor, Faculty of Biosphere-Geosphere Science, Okayama University of Science
Member	Dr. SAKURA Osamu	Science and technology studies	Professor, Interfaculty Initiative in Information Studies, The University of Tokyo
Member	Dr. Kevin Short	Anthropology	Former Professor, Department of Environmental Information, Tokyo University of Information Sciences
Member	Ms. TAKAMURA Yukari	International law, Environmental law	Professor, Institute for Future Initiatives
Member	Ms. TSUJI Atsuko	Science journalist	Project Professor, Chubu University
Member	Dr. YOKOYAMA Jun	Systematic botany	Professor, Faculty of Science, Yamagata University