



The Pontifical Academy of Sciences

SCIENCE AND ACTIONS FOR SPECIES PROTECTION

Noah's Arks for the 21st Century

A conference by the Pontifical Academy of Sciences
with partners from Natural History Museums,
Zoological and Botanical Gardens



13-14 May 2019 | Casina Pio IV | Vatican City



... “The earth’s resources are also being plundered because of short-sighted approaches to the economy, commerce and production. The loss of forests and woodlands entails the loss of species which may constitute extremely important resources in the future, not only for food but also for curing disease and other uses. Different species contain genes which could be key resources in years ahead for meeting human needs and regulating environmental problems. It is not enough, however, to think of different species merely as potential ‘resources’ to be exploited, while overlooking the fact that they have value in themselves. Each year sees the disappearance of thousands of plant and animal species which we will never know, which our children will never see, because they have been lost for ever. The great majority become extinct for reasons related to human activity. Because of us, thousands of species will no longer give glory to God by their very existence, nor convey their message to us. We have no such right.”

Pope Francis, “Laudato Si’”, 32-33

Concept and focus of the conference

The Papal encyclical *Laudato Si'* represents a strong critique of modern consumerism and its catastrophic effects on biodiversity. It warns us about the planet's endangered ecology and points to the need for science and politics to engage with religious and moral authorities to review the current situation and propose joint strategies aimed at changing the trajectory of humankind. In principle, all major world religions are committed to respecting and preserving nature and can agree on joint actions for this objective. The subtitle “**Noah's Arks for the 21st Century**” refers to the Bible's story of the destructive flood and Noah rescuing humankind and species with his ark following God's order (*Genesis* 6-9). The story seems based on older Mesopotamian references, i.e. the Epic of Gilgamesh and other sources that appear in the 20th-16th century BCE. Today, our common fascination with nature leads us to preserve species in zoological and botanical gardens threatened by man-made environmental destruction, including climate change and the related loss of species. In these, as well as in natural history museums, endangered and/ extinct species can be studied, so that conservation can have a sound basis. We understand that these attempts to build “Noah's Arks for the 21st century” may not be sufficient to comprehensively prevent the threats of global loss of species by building and studying islands of protection. Nevertheless, the worldwide communities managing natural history museums, zoological and botanical gardens and engaging in research around them, as well as inspiring millions of visitors, have the potential to become catalytic and significant allies in the global drive toward species protection and nature preservation.

The **Pontifical Academy of Sciences** has addressed these challenges before, i.e. with conferences on...

- Biological Extinction - How to Save the Natural World on Which We Depend, PAS-PASS Workshop 2017 <http://www.pas.va/content/accademia/en/events/2017/extinction.html>
 - Health of People and Planet: Our Responsibility, PAS-PASS Conference 2017, with a focus on climate change <http://www.pas.va/content/accademia/en/events/2017/health.html>
 - Science and Sustainability. Impacts of Scientific Knowledge and Technology on Human Society and Environment, 2016 http://www.pas.va/content/accademia/en/events/2016/science_and_sustainability.html
 - Sustainable Humanity, Sustainable Nature: Our Responsibility 2014, <http://www.pas.va/content/accademia/en/events/2014/sustainable.html>
 - Evolving Concepts of Nature, 2014, <http://www.pas.va/content/accademia/en/events/2014/nature.html>
- This conference draws on these earlier conferences and related statements by the Academy, and takes note of consultations related to the topic, such as The Assisi Declarations (1986): Messages on Humanity and Nature from Buddhism, Christianity, Hinduism, Islam & Judaism <http://www.arcworld.org/downloads/THE%20ASSISI%20DECLARATIONS.pdf>
- We note at the outset that the global context of species extinction and loss of biodiversity in the Anthropocene is a consequence of human actions, competition for land and water use, global environmental change, and climate change in particular, as elaborated in the above-mentioned PAS conferences. During these conferences it has been estimated repeatedly that about one fifth of all non-bacterial organisms will be in danger of extinction in the next few decades, and as many as half by the end of the 21st century. These insights provide the background of this conference.
- The different **focus of this PAS conference** and its expected contribution is to bring together the three important communities that engage in science and action for biodiversity and species protection under the umbrella of the Academy; i.e. partners from **natural history museums, zoological and botanical gardens**. All three of these communities combine research on conservation and species protection with communications and educational activities, reaching millions of people, including youth. Combining elements of political engagement, public education and conservation knowledge and action, the global communities of natural history museums, zoological and botanical gardens are positioned exceptionally well to bring together stakeholders for a conference that leverages the strengths of science and social and spiritual engagement to propose actions that can reach large populations worldwide. Each community can do so from a different and complementary angle:
- **Natural history museums.** Natural history museums and natural history collections are the key to learn about nature – its past, its present, and its future. Several thousand organizations worldwide have assembled billions of specimens and associated information. These collections are a unique and truly global scientific infrastructure for science and society as well as the source of much of the information on which effective conservation action can be based. These collection-based, cutting-edge research institutes also attract millions of visitors every year. Gaining in number and scope in the 18th century Age of Enlightenment,

they have been reaching people of all ages and classes, instilling a deep love for nature and nurturing scientific inquiry and curiosity for more than four centuries.

- **Zoological gardens.** The European Association of Zoos and Aquaria (EAZA), and other regional and global zoos maintain high-level contacts with local, national and regional legislators, global conservation bodies and in situ conservation projects, zoological researchers, educational institutes, and organizations with a similar interest in learning about and preserving biodiversity. Campaigns run by EAZA and similar institutions point to a strong social justice agenda whereby the preservation of biodiversity must also support the development of communities in biodiverse regions globally, providing education and alternative solutions to the conservation challenges of the modern age, from human/wildlife conflict to the exploitation of the natural world for extrinsic gain at all levels.
- **Botanical Gardens.** Botanical gardens, which were first established in modern times as adjuncts to medical schools during the Italian Renaissance in the early 16th century, immediately began to house herbarium collections. Research in plant systematics and evolution is carried out mostly in botanical gardens, natural history museums, and universities, and becomes the factual basis on which plant conservation can be carried out. The displays held by botanical gardens were largely for ornamental and educational purposes until the world as a whole became broadly concerned about our dire and rapidly growing need to preserve biodiversity for future generations

in the late 1970s. Since then botanical gardens, like zoos, have become increasingly involved in (plant) conservation globally; they have a great advantage over their zoological counterparts in that many different tissues of plants can be induced to grow, giving rise to new individuals, and their seeds can be stored for centuries or even longer under the proper circumstances.

The format of the conference will offer each of the three communities the opportunity to present their cutting-edge research and communications outreach activities. However, the conference will also attempt to explore new synergies among these communities for enhanced impact on people's world views and new collective actions to address extinction problems. Together with members of the Pontifical Academy of Sciences, this will include assessment of potentials and challenges of building "Noah's Arks" in our times with new virtual and practical approaches. In this pursuit, the conference will also seek engagement with different faiths.

Organizational aspects

Conference papers will subsequently be revised for open-access publication in an edited volume. Therefore, presenters are asked to contribute papers of up to 15 pages to be provided at the time of the conference. For the presentations at the conference, PPTs are welcome but the Academy does not publish PPTs.

A workshop statement will be drafted by PAS prior to the workshop in consultations with the co-organizers. It will be finalized with participants at the conference and shall form the basis for media outreach.

Program

Day 1 | Monday, 13 May 2019

1. OPENING AND INTRODUCTORY REMARKS

- 9:00 Introducing the context of biodiversity loss and its consequences as outlined by *Laudato si'*
Marcelo Sánchez Sorondo | Bishop Chancellor of the Pontifical Academy of Sciences
Joachim von Braun | President of the Pontifical Academy of Sciences

2. LESSONS AND INSIGHTS FROM NATURAL HISTORY MUSEUMS RESEARCH AND OUTREACH Chair: **Johannes C. Vogel**

- 9:20 **Johannes C. Vogel** | Director of Natural History Museum, Berlin, Germany
Innovation with participation or what has the humble shark ever done for us?
- 9:40 Discussion
- 9:50 **Bruno David** | President, Muséum National d'Histoire Naturelle, Paris, France
Museum Manifesto: What Future Without Nature?
- 10:10 Discussion
- 10:20 Coffee Break
- 10:50 **Lori Bettison-Varga** | President & Director, Natural History Museum of Los Angeles County, USA
Community engagement with nature
- 11:10 Discussion
- 11:20 **Richard W. Lariviere** | President, The Field Museum, Chicago, Illinois, USA
Nature & culture
- 11:40 Discussion
- 11:50 General Discussion
- 12:30 Lunch at the Casina Pio IV

3. LESSONS AND INSIGHTS FROM ZOOLOGICAL GARDENS RESEARCH AND OUTREACH Chair: **Thomas Kauffels**

- 14:00 **Thomas Kauffels** | Director, Opel-Zoo, Kronberg, Germany, and Chairman, European Association of Zoos and Aquaria (EAZA), UK
Zoos – how did their roles evolve
- 14:20 Discussion
- 14:30 **Gloria Svampa Garibaldi** | President, Italian Association of Zoos and Aquaria, Zoological Director of the Education & Nature Conservation Departments of the City Museum of Zoology of Rome, Italy
Zoos and public conservation education
- 14:50 Discussion
- 15:00 **Theo B. Pagel** | Zoo Director and CEO of Cologne Zoo, Germany
Zoos mobilising the public for legislative change
- 15:20 Discussion
- 15:30 **Mark Pilgrim** | Vice-Chair EAZA and Chester Zoo CEO, UK
Zoo-led science and the global conservation of species
- 15:50 Discussion
- 16:00 Coffee Break
- 16:30 **María Clara Domínguez** | Cali Zoological Foundation, Colombia
Zoos: Connecting people with Nature
- 16:50 Discussion
- 17:00 General Discussion
- 18:00 Dinner at the Casina Pio IV

Day 2 | Tuesday, 14 May 2019

4. LESSONS AND INSIGHTS FROM BOTANICAL GARDENS RESEARCH AND OUTREACH Chair: Peter H. Raven

- 9:00 **Peter H. Raven** | PAS Academician
Plant conservation: Challenges and opportunities
- 9:20 Discussion
- 9:30 **John R. Clark** | Chair of the Center for Plant Conservation, San Diego, California, USA
The Center for Plant Conservation model to urgently and effectively conserve North American plants
- 9:50 Discussion
- 10:00 **Paul Smith** | Secretary General of Botanic Gardens Conservation International, London, UK
Can botanic gardens conserve all of the world's rare and threatened plant species?
- 10:20 Discussion
- 10:30 Coffee Break
- 11:00 **Sergey Volis** | Kunming Institute of Botany, Cas, China
Conservation-oriented restoration as a primary solution
- 11:20 Discussion
- 11:30 **Anthony N. Hitchcock** | Kirstenbosch National Botanical Gardens, SANBI, South Africa
Erica verticillata, from extinction to restoration
- 11:50 Discussion
- 12:00 **Christina Walters** | Seed storage, USDA-ARS National Laboratory for Genetic Resources Preservation, USA
Plant germ plasm preservation research
- 12:20 Discussion
- 12:30 **Alberto Gómez Mejía** | President of Colombian Botanical Gardens Network, Colombia
The National Collection of Colombia's Native Palms: a testimony of love for the planet earth
- 12:50 General Discussion
- 13:00 Lunch at the Casina Pio IV

5. OVERARCHING ISSUES: SCIENTIFIC, MORAL / RELIGIOUS, AND POLITICAL ASPECTS OF SPECIES CONSERVATION AND HUMAN BEHAVIOR CHANGE

Chair: Joachim von Braun

- 14:30 **Hailemariam Desalegn Boshe** | Former Prime Minister of Ethiopia and Chair of Hailemariam & Roman Foundation
Policies in Africa and Ethiopia for protection of nature and species
- 14:50 **Virgilio Viana** | Director General of Sustainable Amazon Foundation (FAS), Manaus, Brazil
Engaging Amazon villages in biodiversity conservation through bioeconomy
- 15:10 **Marco Lambertini** | Director General, WWF
Conserving the diversity of life: A moral duty and imperative for equitable development
- 15:30 **Philippa J. Benson** | Managing Editor | Science Advances, Washington, DC, USA
Publishing on the imperative of species protection: Furthering the impact science in a time of changing norms
- 15:50 Discussion
- 16:00 **Yehoshua Weisinger** | "Bioethics and Law Initiative", Sackler Faculty of Medicine, Tel Aviv University; Schlesinger Institute for Medical-Halachic Research, Shaare Zedek Hospital, Jerusalem, Israel
- 16:10 Coffee Break
- 16:40 **Wilhelm Barthlott** | Prof. em., Nees-Institute for Biodiversity of Plants, University of Bonn, Germany
Plants and Nature in Bible and Koran – how respect for nature connects us
- 17:00 **Mikkel Wold** | Lutheran Parish Priest at Marmorkirken, Copenhagen, Denmark
- 17:20 Discussion
- 17:30 Presentation of Workshop Statement by PAS President and Co-Organizers
Johannes C. Vogel, Thomas Kauffels, Peter H. Raven
- 18:00 Closing of Conference and Follow Up
Marcelo Sánchez Sorondo | Bishop Chancellor of the Pontifical Academy of Sciences
Joachim von Braun | President of the Pontifical Academy of Sciences
- 19:00 Dinner at the Casina Pio IV

List of Participants

Vanderlei S. Bagnato | PAS Academician

Wilhelm Barthlott | Prof. em., Nees-Institute for Biodiversity of Plants, University of Bonn, Germany

Philippa J. Benson | Managing Editor, Science Advances, Washington, DC, USA

Lori Bettison-Varga | President & Director, Natural History Museum of Los Angeles County, USA

Joachim von Braun | President of the Pontifical Academy of Sciences

John R. Clark | Chair of the Center for Plant Conservation, San Diego, California, USA

Sarah Darwin Vogel | Botanist, Berlin, Germany

Bruno David | President, Muséum National d'Histoire Naturelle, Paris, France

Hailemariam Desalegn Boshe | Former Prime Minister of Ethiopia and Chair of Hailemariam & Roman Foundation

María Clara Domínguez | Cali Zoological Foundation, Colombia

Alberto Gómez Mejía | President of Colombian Botanical Garden Network, Colombia

Anthony N. Hitchcock | Kirstenbosch National Botanical Gardens, SANBI, South Africa

Thomas Kauffels | Director, Opel-Zoo, Kronberg, Germany, and Chairman, European Association of Zoos and Aquaria (EAZA), UK

Marco Lambertini | Director General, WWF

Richard W. Lariviere | President, The Field Museum, Chicago, Illinois, USA

Theo B. Pagel | Zoo Director and CEO of Cologne Zoo, Germany

Mark Pilgrim | Vice-Chair EAZA and Chester Zoo CEO, UK

Peter H. Raven | PAS Academician

Marcelo Sánchez Sorondo | Bishop Chancellor of the Pontifical Academy of Sciences

Paul Smith | Secretary General of Botanic Gardens Conservation International, London, UK

Gloria Svampa Garibaldi | President, Italian Association of Zoos and Aquaria, Zoological Director of the Education & Nature Conservation Departments of the City Museum of Zoology of Rome, Italy

Virgilio Viana | Director General of Sustainable Amazon Foundation (FAS), Manaus, Brazil

Johannes C. Vogel | Director of Natural History Museum, Berlin, Germany

Sergey Volis | Kunming Institute of Botany, Cas, China

Christina Walters | Seed storage, USDA-ARS National Laboratory for Genetic Resources Preservation, USA

Yehoshua Weisinger | “Bioethics and Law Initiative”, Sackler Faculty of Medicine, Tel Aviv University; Schlesinger Institute for Medical-Halachic Research, Shaare Zedek Hospital, Jerusalem, Israel

Mikkel Wold | Lutheran Parish Priest at Marmorkirken, Copenhagen, Denmark

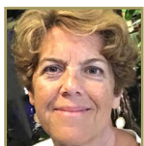
Biographies of Participants



Vanderlei S. Bagnato Professor Bagnato's activities are based on laser cooling and trapping of neutral atoms and applications of optics and laser to health science. He has pursued pioneering work in the field of atomic and molecular physics with worldwide recognition. He has studied Quantum Turbulence involving atomic superfluid, and time and frequency metrology with the construction and evaluation of the first atomic clock developed in Latin America and the first pilot plant for the production of high precision microscopes. Recently the research group under his guidance implemented for the first time in Brazil the clinical use of Photo-Dynamic-Therapy for the treatment of cancer and microbiological control. A strong relation between basic research and industry is one of the characteristics of the work carried out by Bagnato, resulting in the implementation of high technology industries in the field of optics. During his academic life, he has supervised over 60 graduate students and he is presently supervising 21 graduate students involved in several research programs as well as many undergraduates. He maintains close international relations with many institutions around the world. Diffusion of science organizing a special TV channel and public exhibitions are part of his activity.



Wilhelm Barthlott (born 1946) studied biology, physics, chemistry, and geography in Heidelberg, became 1981 professor at the Freie Universität Berlin and held since 1985 the chair of botany at the University of Bonn as director of the Botanic Gardens. Emeritus since 2011. Work focusses on Biodiversity and Biogeography, and in nanostructures of biological surfaces. He became one of the leading pioneers in bionic technical interfaces ("lotus effect"). Member of several academies and various honors and awards. Nature conservation and extensive travels in Near East and Africa lead to his interest in plants and nature in Bible and Koran. Publications and further Information:
<https://scholar.google.de/citations?user=IKKr5qEAAAAJ&hl=de>
https://en.wikipedia.org/wiki/Wilhelm_Barthlott



Philippa J. Benson received her Ph.D. from Carnegie Mellon University (CMU). In her doctoral work, she studied the cognitive processes of reading, writing, and information design, with a focus on how adults (both native and non-native speakers of English) create and revise scientific and technical texts. She has published extensively on topics related to scientific and technical writing. Dr. Benson is currently the Managing Editor of Science Advances, the online expansion of Science magazine, the first high impact open access publication from AAAS. In addition to decades of work launching and leading scientific journals publication programs related to biodiversity conservation and related topics, she also regularly lectures in both the U.S. and abroad about effective technical communication and scientific publishing. Over the past 25 years, she has developed and taught a wide array of courses in science writing and technical communication at institutions including Carnegie Mellon, Georgetown University, University of Pittsburgh, the National Institutes of Health, and the United Nations. She also led PJB Consulting, a firm with diverse international clients involved in STM publishing including the PLOS suite of journals, the United Nations, and the American Society for Nutrition.



Lori Bettison-Varga joined NHMLAC in 2015, overseeing the Natural History Museum, La Brea Tar Pits, and the William S. Hart Museum. Her strategic goals for institutional growth are to expand NHMLAC's role as museums of, for, and with L.A.; create a new interdisciplinary model for understanding and connecting to urban nature; and strengthen and activate the museums' research and collections to create and communicate new knowledge about our world. She served six years as President of Scripps College before NHMLAC, and prior to entering administration, was a teacher and scholar in the fields of geology and academic pedagogy.



Joachim von Braun | PAS President is considered an internationally leading expert on the problems of hunger and malnutrition and solutions of these problems. His scientific publications address poverty, international development economics, economics of natural resources, agriculture, and science and technology policy. von Braun was Director General of the International Food Policy Research Institute (IFPRI) based in Washington, DC, USA from 2002 to 2009. Since 2009 von Braun is Director of the Center for Development Research (ZEF) and Professor for Economic and Technological Change at University of Bonn, Germany. ZEF is Germany's leading multi-disciplinary research institute on aspects of development. von Braun serves as chair of the Bio-Economy Council of the German Government, and on various international, and European advisory councils. He has had work experience in the following countries: Egypt, Gambia, Guatemala, Rwanda, Sudan, Ethiopia, India, China, Bangladesh, Russia.



John R. Clark serves a dual role as president and chief executive officer of the Center for Plant Conservation (CPC) and as Director of Plant Collections and Strategy at San Diego Zoo Global. Dr. Clark and then CPC Chairman of the Board Dr. Peter Raven successfully lead an initiative to relocate the Center for Plant Conservation's National Headquarters from St. Louis to San Diego Zoo Global. Here, Dr. Clark continues to lead CPC's national efforts to save endangered plants through scientific research, applied conservation, and technology innovation. While Dr. Clark's training and background is in basic research, his particular passion is for developing strong collaborations – bringing together world experts in a variety of disciplines – to achieve measurable conservation outcomes.



Sarah Darwin is both an artist and a scientist. She works as a researcher at the Museum für Naturkunde Berlin on a citizen science project on the small migratory bird the nightingale, revered in cultures across Euroasia. Sarah is interested in evolution, biodiversity and the changing relationship between humans and nature.



Bruno David is President of the French National Natural Science Museum. Formerly, he was CNRS director of research and founder of the laboratory BIOGÉOSCIENCES, University of Burgundy. Originally trained in geology and paleontology, his works focused on evolutionary biology tackled both on fossil and living forms. He participated to scientific expeditions in the Southern Ocean and in Antarctica, in the West Indies, South America, Africa, and in the Pacifica where he dived with the submersible Nautilie. He was president of the scientific council of the Muséum National d'Histoire Naturelle, Deputy Director at the CNRS Institute for Ecology and Environment, and member of many scientific councils.



Hailemariam Desalegn Boshe, born in July 19th 1965 in Bolososore, Wolyita, served as the prime minister of Ethiopia from 2012 up to 2018. He made history by having one of the few peaceful power transitions in Africa. His term in office boasts sustained double digit economic growth spurred by several mega projects throughout his country. Former university lecturer and Dean, Hailemariam has served as Vice President and President of the Southern Nations Nationalities and Peoples' Regional state. He also served as Special Advisor to the Prime Minister as well as Deputy Prime Minister and Minister of Foreign Affairs of Ethiopia. After leaving office, Hailemariam founded and is the chairperson of Hailemariam and Roman Foundation. The foundation focuses on mother and child healthcare, prevention of non-communicable diseases, nutrition and climate smart eco-tourism and conservation. In addition, he is serving as board member and chairperson of various local and international organizations. He also engages in giving public lectures on domestic and worldwide pressing issues.



María Clara Domínguez, Director of Fundación Zoológica de Cali, an NGO in charge of administering the Municipal Zoo of the city of Cali, Colombia. Maria Clara was assigned as Director in October 1987 after graduating in Animal Sciences at the National University of Colombia. When the Zoological Society of Cali, took over the park and assigned Maria Clara as Director, the park was in the verge of being closed due to its ruinous condition. In time the park has been positioned as one of the leading zoological institutions in Latin America. The Zoo achieved AZA certification status in may 2016. As Director of Cali Zoological Society Maria Clara has been President of the Colombian Association of Zoos and Aquariums (ACOPAZOA), during two periods: 1991- 1996 and 2001 – 2003. President of the Latin American Zoos and Aquariums Association ALPZA 2004 – 2009. Several times speaker in ALPZA, EAZA, WAZA and Brazilian Zoos Association, and ACOPAZOA meetings. Maria Clara Participated in a graduate course on Conservation for Endangered Species in Jersey Wild Life Preservation Trust, England (1997). And Social Management and International Cooperation in Universidad San Buenaventura Cali (2006). The Cali Zoological Society has been working with the local environmental and educational authorities; during the last few years we have been coordinating the city's environmental plan through public schools. We designed and built an Amazon fauna Park in Mocoa, state of Putumayo, and received a large portion of Illegal trafficking fauna seized by the environmental authorities during the last 10 years.



Alberto Gómez-Mejía Colombia has the third most diverse collection of the Palmae family in the world, with 256 species. For this reason, in 1993 Quindio Botanical Garden began the National Palm Collection. It has collected specimens of 210 native species. It is the most important *ex situ* collection in the country. Other expeditions will be undertaken to achieve all the palms occurring in Colombia. The Quindio Botanical Garden also has a palm nursery and an Ethnobotanical Palm Museum on site, that contains samples of objects made with materials of Colombian palms, as well as those made from palms from other countries of the world.



Anthony N. Hitchcock Born in Cape Town, studied botany, horticulture and landscape design at UCT and Cape Technikon. Began working at Kirstenbosch National Botanical Garden in 1983. Managed the Plant Production Nursery promoting South African plant species with horticultural potential to the South African Nursery industry. In 2002, appointed Nursery Manager managing and leading the living collections and threatened species programme. I rebuilt the Collections Nursery and developed and implemented an integrated conservation programme focussing on threatened Cape Flats Sand Fynbos habitats and species. My knowledge includes extensive propagation and cultivation of South African plants, commercial horticulture and complex conservation programmes.



Thomas Kauffels Born 1958 Neuss/Rhein, Germany; married; 2 sons. After school 1977-1979: apprenticeship as animal keeper in Krefeld Zoo, Germany; 1979 – 1982: animal keeper in San Diego Zoo, San Diego Wild Animal Park (both California, U.S.A), Hannover Zoo and Cologne Zoo (both Germany); 1982-1984: Cologne University and 1984 -1988: Bonn University M.S. Biology (Diplom-Biologe); 1988-1991 Curator and 1991-1998 Assistant director at Wuppertal Zoo, Germany; 1993 Ph.D. as extern at Bonn University; 1998-running Director at Georg von Opel-Freigehege fuer Tierforschung (Opel-Zoo), Kronberg im Taunus, Germany. 2007 - running: Board member of Verband der Zoologischen Gärten (VdZ); 2010 – 2013: President VDZ; 2009 – running: Council member European Association of Zoos and Aquaria (EAZA); 2016 – running: Chairman EAZA; 2017 – running: Member of the Membership and Professional Ethics Committee World Association of Zoos and Aquaria (WAZA); 2018-running: Chairman WAZA Membership and Professional Ethics committee; 2017 – running: Member WAZA council.



Marco Lambertini is Director General of WWF International, having first worked with WWF as a youth volunteer in his native Italy. As the head of one of the largest and most respected nature conservation organizations, he works with world leaders, corporate executives and civil society to forge a future in which people and nature thrive. He sits on the China Council for International Cooperation on Environment and Development (CCICED), is an international ambassador of the Food and Land Use Coalition (FOLU) and a founding member of the Friends of Ocean Action. He leads a global Network with over 50 years of environmental conservation successes, five million supporters, 30 million followers on social media and activities in over 100 countries. Prior to joining WWF, he served as Chief Executive of BirdLife International where he restructured and led a highly decentralized secretariat, overseeing a global partnership of over 120 civil society organizations based in countries and territories in all continents. Marco's experience and career ranges from field research to international policy, nature reserve management, environmental education, communications and campaigning, NGO development, ecotourism and integrated conservation and development projects in many countries all over the world. Marco Lambertini has a degree in Pharmaceutical Chemistry from the University of Pisa, with a thesis on ecotoxicology, and has published books ranging from *Safari in Africa* (Muzzio) to *A naturalist's guide to the Tropics* (Chicago University Press). Twitter: @WWF_DG.



Richard W. Lariviere is the President and CEO of the Field Museum. His career in academia and business is grounded in his expertise on India. He was a professor and Dean of Liberal Arts at The University of Texas at Austin, Provost and Executive Vice-Chancellor at the University of Kansas, and president of the University of Oregon. He has a BA from the University of Iowa and a PhD from the University of Pennsylvania. He is a Fellow of the Royal Asiatic Society of Great Britain, a Life Member of the Council on Foreign Relations, and a Fellow of the American Oriental Society.



Theo B. Pagel After the study of biology, geography and education science at the Heinrich-Heine-University, Düsseldorf, Theo B. Pagel worked from 1991-2007 as curator at Cologne Zoo. Since 2007 he is CEO of this institution. Beside that he was coordinator for the EEP Bali Mynah and served from 2013 – 2016 as president of the Association of Zoological Gardens (VdZ). Since 2007 he is docent and since 2016 honorary professor at the University of Cologne, Math.-Nat. Faculty. From 2012 till today he is a member of the Council of the EAZA, since 2015 he is in the council and President-elect of WAZA since last year. Additionally he is active in several Specialist Groups of the IUCN. Pagel wrote over 300 papers and books, about animals, especially birds, conservation and zoobiology.



Mark Pilgrim With a passion for animals from childhood, he graduated with a degree in Science from the North East London Polytechnic. He joined the North of England Zoological Society, Chester Zoo as a bird keeper in 1988 and later became the Deputy Curator of Birds, followed by the Chief Curator. In 2007 he became Director of Conservation & Education and published his Ph.D on conservation genetics in 2010 and was appointed Chief Executive Officer of the Society, only the fourth in its history. Additionally, he is the vice Chairman of the European Association of Zoos and Aquaria (EAZA) and Chairman of the Technical Assistance Committee of EAZA that assists zoos to reach the high standards set by EAZA. He coordinates the European zoo populations of the Black rhinoceros, *Diceros bicornis* and the Ecuadorian Amazon parrot, *Amazona lilacina*. He believes in inspiring communities at home and overseas with the wonder of nature and the desire to protect the natural world.



Peter H. Raven, Professor, FMRS, is George Engelmann Professor of Botany, Washington University in St. Louis, and President Emeritus, Missouri Botanical Garden, specializing in plant systematics, evolution, and conservation, past home secretary of the U.S. National Academy of Sciences and member of a number of other national academies worldwide, including those of China, Russia, India, Argentina, Brazil, and Mexico. Author or editor of numerous papers and books, including the world-leading botany text *Biology of Plants*. Co-editor of the 49-volume *Flora of China*, Raven is recognized for the term and hypothesis of coevolution. Recipient of the U.S. National Medal of Science.



Marcelo Sánchez Sorondo | PAS Chancellor was born in Buenos Aires and was ordained a priest in 1968. He was lecturer in the history of philosophy at the Lateran University in Rome where he became full professor. He was dean of the Faculty of Philosophy at the same university and full professor of the history of philosophy at the Libera Università Maria SS. Assunta, Rome. In 1998 he was appointed Chancellor of the Pontifical Academies of Sciences and Social Sciences by St John Paul II, who then consecrated him titular Bishop of Vescovio. Awards: Cavaliere di Gran Croce (Italy); official of honour of the Légion d'Honneur (France); Grão Mestre da Ordem de Rio Branco (Brazil), Official of the Republic of Austria, Knight of the Republic of Chile, Member of Accademia dei Gergofli, Member of the Accademia Italiana del Vino; Corresponding Member of the Academia de Ciencias de Cuba; Orden del Aguila Azteca (Mexico); Innovation Award of the Gregor Mendel Foundation.



Paul Smith is the Secretary General of Botanic Gardens Conservation International (BGCI). BGCI is the largest plant conservation network in the world, comprising 600 member institutions in 100 countries. Paul joined BGCI as Secretary General in March 2015. Prior to this, Paul was Head of the Royal Botanic Garden, Kew's Millennium Seed Bank (MSB). During his nine years at the helm there, seeds from >25,000 plant species were conserved in the MSB and, in 2009, the MSB achieved its first significant milestone, securing seed from 10% of the world's plant species, prioritising rare, threatened and useful plants. Paul trained as a plant ecologist, and is a specialist in the plants and vegetation of southern Africa.



Gloria Svampa Garibaldi, zoologist, is leading the Education and the Nature Conservation Depts of the City Museum of Zoology of Rome. Graduated with a specialist degree in Natural Sciences from the "Sapienza" University of Rome, Gloria has started her career at the Rome Zoo, at first as zoo educator and curator of Mammals and, afterwards, as Scientific Director. At present she is the President of the Italian Association of Zoos and Aquaria. University teacher, member of the Conservation Planning Specialist Group SSC/IUCN and member of the Italian CITES Scientific Authority, she is, above all, an enthusiastic nature conservation educator and communicator.



Virgilio Viana is an expert in forestry and sustainable development. He received a PhD in evolutionary biology from Harvard University and did post-doctoral work on sustainable development at the University of Florida. He was formerly professor of forest sciences at the Higher School of Agriculture Luiz de Queiroz, at São Paulo University. Dr. Viana coordinated the Brazilian consultative process that led to the establishment of the Forest Stewardship Council (FSC) in 1993. He was the founder and President of IMAFLORA, the first Latin-American-based forest certifier, and in 2003 he became the first Secretary of Environment and Sustainable Development for the state of Amazonas, Brazil, which had the mission of coordinating the state's sustainable development program, known as the Green Free Trade Zone. In 2008, Dr. Viana transitioned to a new role as Director General of the Amazonas Sustainable Foundation (FAS), an organization charged with implementing the Bolsa Floresta Program, as well as providing the institutional framework to market environmental services of Amazonas' forests.



Johannes C. Vogel, Ph.D., received his doctorate in genetics from the University of Cambridge and subsequently worked at the Natural History Museum in London. Since 2012 he has been Director General at the Museum für Naturkunde Berlin and Professor for Biodiversity and Scientific Dialogue at the Humboldt-Universität zu Berlin. He chairs the European Citizen Science Association and advises the EU Commission and the German Federal Government. His interests are the role of museums in science and society, public engagement with science, open science, democracy and innovation, (inter-)national science with policy, biodiversity and plant evolutionary biology.



Sergey Volis last position was a professor of biology at Kunming Institute of Botany (China). His interest in conservation goes back to the years of studying ecology in Simpheropol State University of the former Soviet Union which he graduated from, and then his PhD project in Ben-Gurion University of the Negev (Israel). He is the author of many publications investigating genetic and demographic population processes, plants' adaptations to local environment, initial stages of speciation and species phylogeography, but his major interest is in plant conservation including all its theoretical and applied aspects.



Christina Walters works at USDA's National Laboratory for Genetic Resources Preservation since 1986 and leads research to improve genebanking of plants important for agriculture and landscapes. She seeks to understand "extreme biology" – quiescent life at extreme dry or cold. Dr. Walters' focus on seeds and pollens, some having natural ability to survive extremes, has contributed concepts and methods for successful preservation of germplasm from diverse plants. Dr. Walters has mentored several young scientists, many of whom are now respected experts in seeds or conservation. She serves on the Science Advisory Committee for the Center for Plant Conservation.



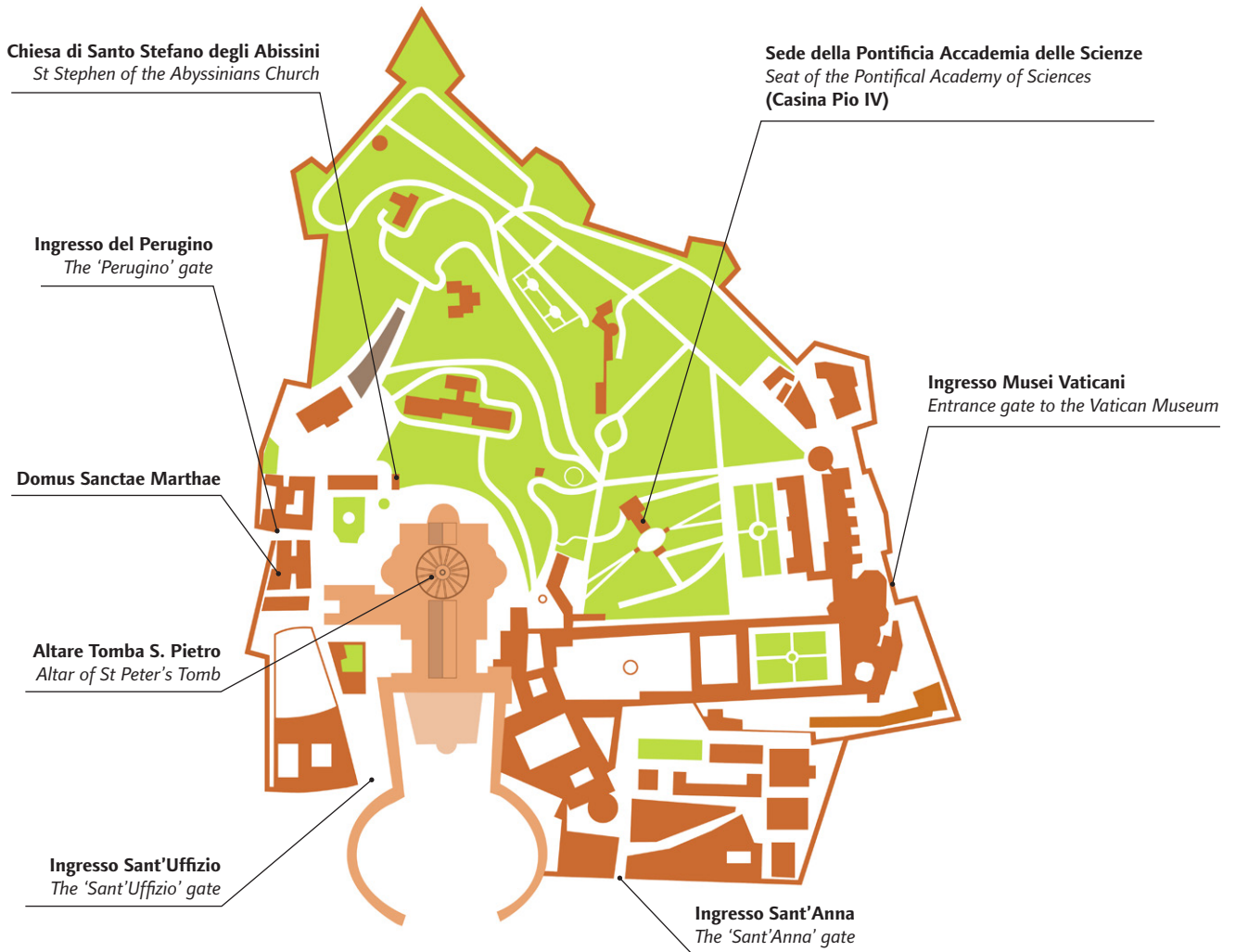
Rabbi **Yehoshua Weisinger** specializes within the field of medicine and Jewish-religious law and is a staff member of Shlezinger Institute at Shaare Zedek Medical Center in Jerusalem. As part of the institute he is involved in research, writing and Halakic rulings with ethical judgments in these topics. He is at the head of a few important social initiatives in Israel, with the purpose of bringing valuable, educational and meaningful discussions within youth and society in Israel. Rabbi Weisinger is heading a program of high Torah learning (Rabbinical studies) for exceptional students in Rehovot. He does that while giving lectures in various medical and educational frameworks. Rabbi Weisinger has studied at Merkaz HaRav Yeshiva, ordained as a senior Rabbi by the Chief Rabbinate of Israel. He specialized at the Puah Institute ("Fertility according to Halacha") in Jerusalem. He has an undergraduate degree in Education (B.A.) and studying currently towards a M.Sc. degree in bioethics, Clinical Genetics and medical sciences at the Medical School of Tel-Aviv University. In addition, Rabbi Weisinger is a member of the editorial staff of several important journals. He publishes in the general media and in leading journals in the field and have published a few books in various fields.



Mikkel Wold (b.1958). Pastor at Marmorkirken, Copenhagen and ass. professor at Center for Pastoral Education and Research. He has a Master of Theology from University of Copenhagen (1992) and has a degree in Logotherapy from Institut für Integrative Logotherapie und Existenzanalyse in Hamburg (1991). He has written several books and many articles in the fields of theology, psychology and society.

Memorandum

- Pickup schedule from your hotels to the Casina Pio IV on 13 and 14 May 2019:
 - A bus will leave the *A.Roma Hotel* at 8.30 a.m. and the *Domus Sanctae Marthae* at 8.45 a.m. to accompany participants to the Academy's Headquarters, the Casina Pio IV.
 - On 13 and 14 May, the same buses will take participants to their hotels after dinner.
- Lunch and dinner will be served at the Academy every day. If you are a vegetarian or have any dietary restrictions (food allergies, and/or religious restrictions), please let us know as soon as possible.
- Wifi credentials:
Network: **WLAN_PADS (WPA2)**
Password: **!!WIFI_2017_PADS!!**



THE PONTIFICAL ACADEMY OF SCIENCES | CASINA PIO IV | V-00120 VATICAN CITY
 Tel: +39 0669883195 | Fax: +39 0669885218 | Email: pas@pas.va
 For further information please visit: www.pas.va | www.endslavery.va

ENDSLAVERY

