

# Symposium S1

The avifauna of the Sino-Himalayas: history, ecology, future

Convenors:

Dieter Thomas Tietze

Institute of Ecology, Evolution and Diversity, Goethe University, Max-von-Laue-Straße 13,  
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Yue-Hua Sun

Institute of Zoology, Chinese Academy of Sciences, Beichenxilu 1-5, Chaoyang, Beijing  
100101, People's Republic of China

Symposium description:

The Himalayas and the adjacent Chinese areas harbor the highest biodiversity on the Eurasian continent. Two major reasons are: Palearctic and Indo-Malayan realms meet here and Earth's highest mountains offer a broad scale of habitats from tropical lowland forests to dry and cold steppes. Ornithologists from many countries around the globe have undertaken various approaches to describe the diverse Sino-Himalayan avifauna, to delimit species, to quantify elevational ranges, to consider causes for the decrease in species richness from the southeast toward the northwest, and to reconstruct historical processes among and within species. This symposium aims to bring together researchers from different continents and fields for exchange of ideas and the development of future perspectives. The whole Sino-Himalayan avifauna is under eminent threat: On the one hand it is squeezed by the two most populous nations in the world with ever-growing hunger for various resources which are freely taken from higher and higher elevations. On the other hand climate change forces species to shift their ranges further up the mountains, thus driving the species already adapted to marginal habitats of the highest elevations into extinction. Action is needed, but also requires insight into the adaptive and dispersal potential of these birds. Such insight might be gained through understanding historical processes over millions of years during the uplift of the Himalayas and the Qinghai-Tibetan Plateau as well as over 20 000 years of glacier retreat, taking the associated climate and vegetation changes into consideration. Such demanding efforts can be best made jointly and from various perspectives that are all invited to come together in this symposium.

## Symposium S2

Rice fields as a model system for studying bird ecology and conservation.

### Convenors:

Chris Elphick

Department of Ecology & Evolutionary Biology, University of Connecticut  
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Tatsuya Amano

Department of Zoology, University of Cambridge, Downing St., Cambridge, CB2 3EJ, UK.

### Symposium description:

Rice occupies >1% of the Earth's ice-free land, grows in 114 countries, and provides 21% of the calories and 15% of the protein consumed by humans. Rice fields are used by hundreds of bird species, and support globally important populations of high conservation interest. Although rice fields occur widely and in many ecological contexts, they are very similar worldwide. Compared to most natural habitats they are simple systems, with one dominant plant species, relatively uniform flooding, predictable disturbance patterns, etc. Typically, they are well replicated, with many similar, yet discrete, units distributed across the landscape. As such, they make an ideal model system for considering basic and applied questions. Researchers have recognized these characteristics and the habitat has been the focus of studies of foraging ecology, population limitation, the influence of landscape heterogeneity on habitat use, community structure, and more. Rice fields have also been the focus of management attention and provide a model for developing conservation strategies that are consistent with highly productive farming. This symposium will bring together researchers using rice fields as a model for asking broad questions of interest to ornithologists. Talks will address ways in which rice fields have been used to answer these questions and opportunities to use rice systems in the future.

# Symposium S3

Light in the darkness: how does artificial night lighting influence bird behaviour and ecology?

Convenors:

Bart Kempenaers  
Department Behavioural Ecology & Evolutionary Genetics  
Max Planck Institute for Ornithology  
Eberhard Gwinnerstr  
82319 Seewiesen, Germany

Caren Cooper  
Cornell Lab of Ornithology  
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Ithaca, NY USA 14950

Symposium description:

Human activities strongly shape the environment through habitat loss, climate change, and chemical and noise pollution. Another important and pervasive anthropogenic influence on natural environments is artificial night lighting. Night lighting is a form of pollution associated with urbanization globally. Artificial night light can disrupt traits that have evolved in response to natural photoperiods. Consequently, light pollution may lead to maladaptive orientation, timing of reproduction, mating patterns, and influence overall reproductive success, communication, and dynamics of competition and predation.

The goal of this symposium is to explore and synthesize the breadth and depth of current research on artificial light pollution and identify research frontiers across ornithology. The preponderance of artificial light research in ornithology currently focuses on orientation and bird strikes into lighted objects. The purpose of this symposium is to draw on the field of chronobiology as a theoretical basis to identify areas of fruitful research on effects of artificial light. Our objectives include (1) reviewing the scope of influence of natural photoperiods, (2) assessing the scope of light pollution and its impacts on birds, (3) survey of technical aspects of studying light pollution and field methods, (4) assessing and anticipating the scope of fitness impacts, and (5) highlighting new frontiers in ornithology as well as trans-disciplinary frontiers.

# Symposium S4

Birds and agroecosystems: experiences from the tropics

Convenors:

Augusto João Piratelli  
Universidade Federal de São Carlos – Campus Sorocaba  
Departamento de Ciências Ambientais  
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Ian MacGregor-Fors  
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El Haya, Xalapa 91070, Veracruz, Mexico

Symposium description:

Because the tropics represent high-productivity areas, and given the need to produce food and energy, tropical lands have been dramatically altered for agricultural purposes. The globalized model of agriculture has promoted monocultures and raising cattle extensively, and this has changed preexistent landscapes, fragmenting and isolating the remnants of native vegetation, deriving in impoverished avifaunas with an overrepresentation of generalist species. Also, recent studies suggest that avian populations and communities can become isolated in landscapes dominated by agricultural lands, potentially reducing their genetic variability. Thus, ecosystem functions can be severely compromised. Some alternative strategies have been proposed aiming to make these areas suitable for biodiversity, including shaded plantations (e.g. coffee) and agroforestry systems, promoting not only the presence of species, but the use of habitats for feeding and nesting. This symposium aims to assess the state of knowledge related to the effects of habitat replacement by agricultural practices in tropical environments. The main goal is to review the effects of reduction in feeding and breeding sites, losses of ecological functions, changes in gene flow and population control. We also expect case studies reporting successful experiences of joining both agriculture production and conservation of tropical birds.

# Symposium S5

Recent advances in the study of Psittaciformes: breeding biology, population ecology and phylogeography.

## Convenors:

Mike Perrin

Research Centre for African Parrot Conservation, School of Life Sciences  
University of KwaZulu-Natal, Private Bag X01, Scottsville, 3201, South Africa

Jörn Theuerkauf

Museum and Institute of Zoology  
Polish Academy of Sciences  
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Poland

## Symposium description:

Psittaciformes are one of the most endangered orders of birds. The Parrot Action Plan (2000–2004, IUCN and World Parrot Trust) considered that 29% of parrot species worldwide are at some risk of extinction. This situation is even worse in the Neotropics, where 34% of the species are at risk of extinction. The principal sources of threat are loss, fragmentation or degradation of habitat, introduction of exotic species, and illegal trade. Specialists agree that these figures have worsened and thus, the Parrot Action Plan is currently being revised as a series of regional review papers.

For most parrot species there is a serious lack of breeding biology data, which are necessary for the identification of specific threats, the monitoring of population dynamics, and the evaluation of the conservation measures to be taken. The continued lack of hard core data is beginning to be stemmed, but remains a particular concern.

Much research on the breeding biology and habitat requirements of Psittaciformes has been carried out in the past decade. This is particularly true for African and Neotropical species, but also Australasian species. Many other research projects are being carried out on ecology, conservation biology and the molecular systematics of poorly known taxa. This information must be made readily available to managers and conservators as well as scientist. There is an urgent need for methods of disseminating this recently gained knowledge.

This symposium will:

- a) Review and update parrot breeding biology, particularly breeding success, and population demography,
- b) Illustrate exciting new research in parrot aut-ecology and conservation biology;
- c) Identify gaps in our knowledge in the systematics and phylogeny of Psittaciformes, and
- d) Propose lines of future research, with especial attention to conservation biology.

# Symposium S6

Avian reintroductions in changing environments

Convenors:

Nagata Hisashi  
Center for Transdisciplinary Research, Niigata University,  
8050 Ikarashi-Nincho, Niigata, 950-2181 Japan

Phillip Seddon  
Department of Zoology, University of Otago, P.O.Box 56, Dunedin 9054, New Zealand

Symposium description:

Over the last 50 years humans have altered the world's ecosystems to a great extent and the Earth has entered its sixth great extinction event. The 2011 Red List assessment found that 1,253 species of birds are classified as globally threatened with extinction. Habitat changes due to human activity, alien invasive species, and global warming are now the major threats facing birds globally. Successful conservation intervention increasingly requires population restoration through conservation translocation to reinforce or reintroduce wild populations. Almost reintroductions have taken place at relatively intact habitat, because less modified release site might successfully restore population.

Habitat modification by agricultural and urban expansion is becoming an important threat to birds globally. Thus the area of natural or relatively intact habitat available in which to undertake reintroductions is shrinking. We need therefore to consider the active restoration of viable wild populations within habitats that have been substantially altered. Although habitat restoration may be necessary before or during reintroduction in highly modified conditions, some avian species will be more adaptable to modified habitats than we assume..

Habitat degradation will be also progressed through global warming, especially for birds inhabiting higher altitude and latitude regions. Habitat restoration is difficult for those species, because suitable range is moving rapidly. Assisted Colonization, a form of Conservation Introduction to establish populations outside their indigenous ranges, might be necessary. To minimize any adverse effects on recipient ecosystems, careful risk assessment is necessary before Assisted Colonisation can proceed.

Rapid economic development in Asia and global warming alter natural habitat, and threaten many bird species with extinction. Many avian reintroduction programmes have been running concurrently in Pan-Pacific area. Crested Ibis and Oriental White Stork have reintroduced into agricultural ecosystems in Japan, in areas that have been modified over a long history of interactions between human and nature.

This symposium at 2014 IOC in Tokyo will consider the growing importance of avian restoration in modified habitats, reviewing national and international case studies, and considering the controversial area of conservation introductions. This symposium is timely as the field of Reintroduction Biology expands to consider more risky forms of population restoration through translocations. Symposium speakers will be able to draw upon the completely revised Reintroduction Guidelines, due to be approved by the IUCN World Congress in September 2012.

# Symposium S7

To understand what birds actually see: toward a newer synthesis of visual perception and methods to study coloration

## Convenors:

Keita D. Tanaka  
College of Science, Rikkyo University  
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Martin Stevens  
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3EJ, UK

## Symposium description:

Birds rely greatly on visual information for many aspects of their lives. This influences and drives much of the diversity in colour patterns in nature, not only of their own coloration but also of organisms with which birds interact, such as fruits and flowers of plants, or vertebrates and invertebrates that they prey on. Thus to know what birds see is in itself interesting and scientifically significant and has long attracted scientific study. However, the visual system of birds is different in many ways from ours (humans), so we need advanced knowledge and techniques to estimate what birds see. This is of great importance in correctly understanding and interpreting the evolution and behaviour of birds and other organisms. In this symposium, we present new techniques to analyze visual information in accordance with birds' visual performances, by integrating new technologies into formerly developed perspectives. The methods we present provide ways to analyze colours and patterns in a more synthesized way. One of the most important issues in current ornithology is comprehensive recording of bird species such as the DNA barcoding. Thus the methods we introduce should also be powerful tools to collect and analyze megadata of bird coloration.

# Symposium S8

Why Birds Matter: Birds' Ecological Functions, Ecosystem Services, and Value to Society.

Convenors:

Daniel G. Wenny

Department of Biology, Loras College, 1450 Alta Vista, Dubuque, IA 52001 USA

Kayoko Kameda

Lake Biwa Museum, 1091 Oroshimo, Kusatsu, Shiga 525-0001, Japan

Symposium description:

Birds are involved in numerous important ecosystem functions that help sustain Earth's diverse ecosystems, yet few of these functions have been quantified or even studied from an ecosystem service perspective. The current challenge is to obtain meaningful calculations of ecosystem services that can be used to incorporate biodiversity conservation into land use management and policy. Recent work on birds' ecosystem services has made progress towards this goal, but much remains to be done. Our objectives in this symposium are to fully describe several main ecosystem services provided by birds, highlight recent progress towards quantifying them, and, finally, to suggest directions for future research. Global efforts to conserve bird populations and sustain avian biodiversity also preserve the diverse ecosystem services provided by birds, thus contributing to human well-being.

Birds are the best studied major group of organisms and are also followed by millions of passionate birdwatchers worldwide. Despite this knowledge base and huge interest in birds, most work on ecosystem services does not include birds. One reason for this omission is that valuation of ecosystem services provided by birds is complex because most of their services are indirect and often result from foraging behavior. A symposium at IOC will be the ideal way to bridge the gap between the current work in ecosystem services and the vast amount of data available on bird populations and ecology that could inform the models on ecosystem services. The level of detail a symposium allows and the international scope of the conference will stimulate discussion and generate interdisciplinary collaborations for future work.

Birds are well-known, diverse, occur world-wide and provide mobile links within and between ecosystems. Thus, birds are ideal for characterizing ecosystem services and the topics will be of interest to a broad audience. We seek papers for this symposium that will explore the scientific basis for ecosystem valuation as an integral part of conservation strategy and sustainability.



# Symposium S9

Vocal communication and vocal control in sub-oscine passerines.

Convenors:

Dinesh Bhatt

Department of Zoology and Environmental Science

Gurukula Kangri University, Haridwar 249 404, Uttarakhand, India

Maria Luisa da Silva

Federal University of Pará, Rua Augusto Correa, 1 Campus Guamá, Belém, PA, Brazil

Symposium description:

Although birds are the best-studied vertebrate group, most studied species are endemic to the temperate zones while about half of all bird species live in the tropics. Further, among the tropical species many belong to the so-called sub-oscine passerines while the temperate zones are dominated by their sister group, the oscines or songbirds. The vocalizations and neuroendocrine vocal control of songbirds have been intensively studied over the last 3 decades while the ones of sub-oscines have been widely neglected. Here we propose to invite presentations that cover the vocal communication of various sub-oscine species and that focus on the neural mechanisms of their vocal control. Concerning the vocal communication, we shall mainly focus on lekking and duetting species due to the complexity of temporal organizations of such behaviours. Concerning the vocal control, we shall provide data on the neural system that drives the syrinx of sub-oscines and compare the molecular, including hormone receptors, equipment of these brain regions and of the syrinx in comparison to songbird species. This neuroanatomical study includes the screaming piha of which Aubin shall present the complexity of its vocal communication. From presentations covering these topics, we shall learn if sub-oscines have individual and/or group vocal signatures, if vocalizations or vocal interactions of sub-oscines are plastic and hormone sensitive, if vocal plasticity and temporal dynamics of sub-oscines require forebrain vocal control areas similar to those of songbirds or can be achieved by mid- and hindbrain vocal areas that are common to all birds. Answers to these questions are important to appreciate whether vocal plasticity is linked to vocal learning and/or hormone sensitivity as seen in songbirds and by this way to understand the evolution of vocal learning.

# Symposium S10

Physiological factors influencing migratory strategies

Convenors:

Cas Eikenaar  
Institute of Avian Research  
An der Vogelwarte 21, 26386 Wilhelmshaven  
Germany

Leonida Fusani  
Department of Biology and Evolution, University of Ferrara  
Via Luigi Borsari 46, 44100 Ferrara  
Italy

Symposium description:

The physiological factors, including the hormones that regulate avian migratory behaviour, are little known. This is surprising since in many bird species migration encompasses a large portion of their annual life-history cycle. Moreover, migration entails a series of risky, energetically demanding activities, which strongly affect survival, thereby shaping population dynamics. While the genetic and environmental effects on strategies of migration have been the focus of much research, the study of the behavioural physiology and endocrinology of migration has lagged behind.

This symposium focuses on physiological factors that contribute to the decision of an individual to initiate, interrupt or continue migration. Our aim is to bring together researchers that study different aspects of migratory behaviour such as hyperphagia, refuelling, sleep, hormones, oxidative damage, and behavioural patterns, to delineate the complex physiological adaptations of birds during the journey to their breeding or wintering quarters.

# Symposium S11

Invasive species and Pacific island bird conservation

Convenors:

N. Suzanne Dauphiné  
Department of Marine and Wildlife Resources  
American Samoa Government  
PO Box 3730 Pago Pago  
American Samoa 96799

Christopher A. Lepczyk  
Department of Natural Resources and Environmental Management  
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Symposium description:

Alien species invasions are one of the major threats to biodiversity today and continue to be spread by global travel, worldwide trade, and climate change. Approximately one third of the world's threatened bird species, the majority of which occur on islands, are affected by invasive species, including alien plants, animals, and pathogenic and/or parasitic microorganisms. Invasive species are responsible for the extinction of more native insular species than any other cause. Island bird species are particularly vulnerable to the impacts of invasive species due to their occupation of limited ranges in relatively simplified ecosystems and, in many cases, their evolutionary isolation from predators. Impacts of invasive species include ecosystem modification, predation, resource competition, hybridization, the spread of disease, and chain reactions caused by the interactions of multiple impacts. Many Pacific islands may be especially susceptible to damage by invasive species because of their isolation from human impacts until relatively recently. In this symposium, we will review recent research on invasive species and Pacific island birds, including specific impacts and case studies, and identify priorities for future research. We will also highlight management actions, such as eradication and control efforts, and recommend strategies that benefit bird conservation.

# Symposium S12

Evolution and behavioral adaptation of waterbirds flying in the air and in the water

Convenors:

Yutaka Watanuki  
Graduate School of Fisheries Sciences  
Hokkaido University, Japan

Julia Clarke  
Jackson School of Geosciences, University of Texas at Austin, USA,

Symposium description:

Birds are the most mobile among animals both in the air and in the water where the density of media differs dramatically. Therefore waterbirds moving in both media show broad scale of morphological and behavioral adaptation to contrasting physical constraints (gravity, buoyancy, drag). Albatrosses and shearwaters fly in the air by gliding, auks fly in the air and swim under the water by propelling small wings and cormorants fly by propelling large wings and swim by propelling small foets. Penguins and extinct great auks only swim by wing-propelling and Galapagos cormorants and extinct Hesperornis only swim by foot-propelling. They are believed to show morphological adaptation to efficient moving in the air and in the water. However, their morphological evolution has not been fully understood and behavioral adaptation (regulation of wing and foot-propulsion) in the wild has been difficult to study. This symposium aims to give insight for understanding evolution of waterbirds through integrating new products of studies on their functional morphology, paleontology and biomechanics.

# Symposium S13

Avian dispersal: Implications for speciation, community build-up and migration

Convenors:

Knud A. Jønsson

Division of Biology, Imperial College London, Silwood Park Campus, Ascot, Berkshire, SL5 7PY, United Kingdom.

Anders P. Tøttrup

Center for Macroecology, Evolution and Climate, Department of Biology, University of Copenhagen, Universitetsparken 15, 2100 Copenhagen Ø, Denmark.

Symposium description:

This symposium will concentrate on how key advances in tracking methodology can be combined with phylogeny to assess the evolution of dispersal. Dispersal is important for the re-distribution of taxa leading to colonization, mixing of gene pools, and exploitation of resources. Still, we lack a basic understanding of dispersal abilities and how these may vary between species and populations with different movement strategies. Although phylogenies are often used to infer dispersal patterns, such patterns may be blurred by historical extinctions, resulting in disjunct distributions that are incorrectly assigned as long-distance dispersal. Thus, more direct methods are required to assess the amount of dispersal for birds. Recent and imminent technological advancements such as geolocators and satellite transmitters enable the tracking of even small passerine birds on a global scale including long distance migrants. Now, it is timely to synthesize the current knowledge of avian dispersal stemming from migration research, historical biogeography and phylogeography to elucidate the impacts of dispersal on speciation, and the role of migration ability.

Current climate change and global land-use changes will alter living conditions for life on earth within the next century; dispersal is one possible option for birds to adjust to these changes.

# Symposium S14

Neural plasticity and the waxing and waning of cognition in birds

Convenors:

Scott A. MacDougall-Shackleton  
Departments of Psychology and Biology  
University of Western Ontario  
London Ontario Canada N6A 5C2

Susan D. Healy  
Schools of Biology and Psychology  
University of St. Andrews  
St. Andrews, Fife, United Kingdom

Symposium description:

Cognition is not a stable property of individuals, animal or human. Cognitive abilities change under the influence of intrinsic factors such as reproductive condition and extrinsic factors such as stress, social status, and pathogens. Much of our understanding of the factors influencing changes in cognition have been pioneered in studies of birds, including studies of song learning and spatial cognition. This symposium will examine the nature of such changes in cognition. Questions addressed include whether changes in cognitive ability are adaptive or merely incidental effects of other neural and physiological changes, whether changes in cognition are the outcome of tradeoffs with other functions, and the possible costs of cognitive ability and its neural mechanisms.

Learning, memory, spatial ability, timing, and other cognitive traits show remarkable plasticity over the lifetime of the same individual. Covariation between endocrine status in both males and females and cognitive abilities such as song learning and spatial ability are well-known examples. Similarly, brain areas with cognitive functions such as the hippocampus and the song control nuclei are known to change in response to changing hormonal condition and factors such as stress and experience. Research on birds has provided a great deal of new information in this area. But why do these changes occur? If changes in neuronal structure and organization can improve cognitive function, why are cognitive functions not maintained at their maximum capacity? Two broad classes of explanation are usually offered. The first is that the neural underpinnings of cognition are energetically costly and so are disassembled when not in use. A second, less explored explanation is that cognitive functions interfere with each other: maintaining some at maximum performance disrupts others. This symposium will examine recent research findings in avian cognition and neuroscience on the waxing and waning of cognition and evaluate current hypotheses of its causes, functions, and adaptive significance.

# Symposium S15

Social complexity, vocal communication and cooperation

Convenors:

Indrikis Krams, Institute of Ecology and Earth Sciences, Tartu University, Vanemuise 46, EE-51014 Tartu, Estonia

Todd M. Freeberg, Department of Psychology, University of Tennessee, Austin Peay Building 301B, Knoxville, TN 37996 USA.

Symposium description:

A number of studies have suggested that communication and seemingly-cooperative interactions in birds are motivated only by short-term, selfish rewards. In non-primate species, furthermore, cognitive skills may also constrain individuals' ability to establish and maintain social relationships and to communicate in complex ways, which could explain why finding evidence for referential communication and contingent reciprocity in non-primate animals has been difficult. However, some other recent evidence suggests that birds have good memory and are indeed capable of acting according to their future, rather than current, needs. The emerging evidence also shows the complexity of an individual's social group can impact the vocal signals used in its interactions with others. As a result, the complexity of social groups may be a driver of the diversity and complexity of vocal signalling systems and cooperative interactions, in both a proximate (mechanistic/developmental) and ultimate (ecological/evolutionary) sense. The main goal of the proposed symposium is to exchange the knowledge based on recent studies in the field of avian sociality and communication in an attempt to use the 'Social Complexity Hypothesis' as a key to explain and predict the origin and evolution of communicative systems and cooperative ability in social birds. The Social Complexity Hypothesis predicts that individuals in more socially complex groups would produce a greater diversity of vocal signals and/or express more diverse cooperative behavior compared with individuals in less socially complex groups. We will review and discuss what is known about vocal complexity in birds and make links to different aspects of their sociality. We would like to summarize the existing knowledge on communication, cooperation, and sociality across countries and continents. Finally, we would like to discuss the advances in techniques to record and analyze bird calls, and terminology on how to describe the existing knowledge.

# Symposium S16

Radar Aeroecology

Convenors:

Jeffrey F. Kelly

Oklahoma Biological Survey and Department of Biology, University of Oklahoma, Norman,  
OK 73019

Felix Liechti

Swiss Ornithological Institute, Seerose 1, 6204 Sempach, Switzerland

Symposium description:

Aeroecology is an emerging area of interdisciplinary science unified by a desire to understand the behavior, density, distribution, and diversity of organisms in the aerosphere (lower free atmosphere), and the role of atmospheric conditions for eco-system connectivity. Birds are a primary focus of aeroecological inquiry because of their dominant role in aeroecological dynamics at many temporal and spatial scales. Improving our understanding of ecology of birds while in the aerosphere is a pressing need as the pace of land cover and climate changes accelerate. The impacts of these anthropogenic changes on the ecology of birds on the lithosphere and in the hydrosphere are relatively well known, but the impact of the changing aerosphere on birds is poorly documented. For example, global declines in avian aerial insectivores may be an indication of systematic changes in the physical or biological characteristics of the aerosphere, but quantitative studies of these attributes and their interactions are rare. Research on avian aeroecology requires overcoming many logistical problems associated with making observations in the aerosphere. We focus primarily on radar as a means of observing aeroecological dynamics. Our specific purpose is to provide information on recent development, validation, and optimization of tools, products, and applications that will enable broad use of radar as an efficient biological sensor of birds in the aerosphere. We focus on validation and optimization of radar with respect to three specific quantitative measurements that are critical to using radar in ornithology: (1) timing of biological activity (Phenology), (2) distributions and densities of animals, and (3) the diversity of animals in the aerosphere. We present both ornithological and meteorological perspectives on these recent advances.



# Symposium S17

Avian Phylogeography in East Asia

Convenors:

Isao Nishiumi  
Curator of Birds, Department of Zoology  
National Museum of Nature and Science, Tokyo  
Amakubo 4-1-1, Tsukuba, Ibaraki 305-0005, Japan

Bailey McKay  
Department of Ornithology  
American Museum of Natural History  
Central Park West at 79th St.  
New York, NY 10024, USA

Symposium description:

Over the last half-century, systematic study of East Asian birds has lagged behind many other areas of the world. However, this is starting to change, and several recent studies have applied molecular tools to address questions of avian evolution in East Asia. These studies have revealed remarkably deep and complex patterns of diversification that equal or exceed species-level diversification found in other parts of the world. In this talk, I will review past work with a special focus on identifying the phylogeographic discontinuities that are shared by multiple taxa. Two important conclusions emerge. First, increasing molecular and morphological evidence suggests that the East Asian bird fauna is overlumped and that current species-level diversity is underestimated. This will hinder conservation work that depends on an accurate assessment of biological diversity for listing, prioritization, and management. Second, several shared phylogeographic divisions in south China, Taiwan, and the islands of Japan suggest that the region has experienced an unexpectedly complicated biogeographic history that is still poorly understood. Future work should focus on characterizing species-level diversity, inferring the evolutionary history of taxa, and determining the historical factors that contributed to diversification in the region. This will provide a predictive framework for the conservation of both species and areas of endemism as well as contribute to our growing understanding of how Earth history events affect biological diversification.

## Symposium S18

Conservation research on woodpeckers: threatened species and indicator value of Picidae

Convenors:

Martjan Lammertink,  
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Grzegorz Mikusinski  
Swedish University of Agricultural Sciences, Department of Ecology  
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Symposium description:

This symposium links two internationally important fields in conservation research on woodpeckers: the biology and management of globally threatened woodpecker species, and the use of woodpeckers as tools in biodiversity conservation. Many species in the nearly cosmopolitan family woodpeckers (Picidae) depend on old-growth and natural forests for their breeding and foraging. Frequently, woodpeckers specialized on old-growth forest qualities are among the most noticeable organisms of ecosystems with such characteristics, and often are perceived as effective indicator, umbrella, and focal species. The first keynote talk will identify common patterns in vulnerability, threats, and conservation of woodpeckers, and identify gaps in knowledge and in conservation actions. The second keynote talk will provide a synthesis of research from around the world on the effectiveness of woodpecker species as indicator species for natural forests, old-growth forests, and forest biodiversity. We invite symposium speakers with research projects concerning the conservation of threatened species of Picidae and studies evaluating the utility of using woodpeckers as indicators of different aspects of biodiversity and conservation.

# Symposium S19

The Evolution of Avian Social Behaviour: from Neuropeptides to Neurogenomics

Convenors:

Yang Liu

State Key Laboratory of Biocontrol and School of Life Sciences, Sun Yat-sen University, Guangzhou, 510275, China

Tamás Székely

Dept of Biology & Biochemistry, University of Bath, Bath BA2 7AY, UK

Symposium description:

Social behaviour, involving interactions with conspecifics, is a basic feature in the lives of animals. Yet, we are only beginning to understand how social behaviour is convergent and divergent in nature. Similar to the evolution of morphological traits, the evolution of behavioural traits is a consequence of both selection on the variation of the behavioural trait in question and inheritance of the behavioural phenotype. However, the evolution of social behaviour may be influenced by complicated genetic mechanisms, e.g. polygenic control, pleiotropy and epigenetic regulation.

Exciting progress has been made recently in this field with the rapid development of genomic tools for evolutionary genetic studies. We have used the comparative genomic approach to identify candidate genes or changes in gene expression levels responsible for substantial variation in social behaviour. Meanwhile, the distribution and variation of key neuropeptide receptors have been demonstrated to play important roles in the regulation of social behaviour in some organisms.

Birds exhibit a diverse array of social behaviours, including flocking, group-living, breeding systems that embrace mate choice, sexual conflict and pair bonds, and parental care strategies. Thus, birds are exemplary model organisms through which we can enhance our understanding of how these traits are selected for (or against) in nature, and how complex behaviours are transmitted from one generation to another. However, the precise neural and genetic/genomic mechanisms that underlie these processes are largely unknown. The goal of this symposium is to further our understanding of the neurogenomic basis of social behaviour that regulates avian social life.

Our specific objectives are three-tiered: (i) to bring together researchers who use different approaches (behavioural ecology, neuro-endocrinology, neuro-genomics, comparative analyses) and to integrate their perspectives into a comprehensive framework to understand social behaviour; (ii) to review recent advances in studies of social behaviour in birds and to outline new methods and approaches that will advance this field; and (iii) to illustrate how selection and genetic variation together may mould social behaviour. The talks of the keynote speakers will focus on the link between ultimate and proximate factors layers that contribute to understanding diversity and variation of social behaviours. We expect contributed papers on fundamental aspects of social behaviour evolution including (i) genetic/genomic and (ii) neuro-endocrinological basis of social behaviour.

# Symposium S20

Avian nest predation: New perspectives

Convenors:

Juan Diego Ibáñez-Álamo

Departamento de Zoología, Facultad de Ciencias. Universidad de Granada. E-18071 Granada, Spain

Robert L. Thomson.

Section of Ecology, Dept of Biology, University of Turku, FI-20014 Turku, Finland

Symposium description:

This symposium will focus on nest predation, a key source of selection for birds. Due to the often conspicuous negative impacts on fitness, nest predation studies have been a popular and relevant field of ornithology for decades. While the long history of nest predation studies, and the theory linked to it, have formed an integral part of avian ecology, methodological improvements and new ecological perspectives have actually caused a considerable increase in nest predation studies in recent years. New technology now allows researchers to monitor nests 24 hr per day, providing access to previously hidden aspects of nest predation processes and allowing a deeper and more detailed perspective on the topic. In addition, enhanced physiological techniques allow a mechanistic approach to understand the risk of nest predation. Investigations considering the community and social information flow relevant to nest predation have opened exciting perspectives within this field. Indeed, the study of nest predation now forms a vital part of research in different areas, from behavioural to population ecology, from evolution to conservation biology. We encourage researchers investigating nest predation in any of its forms to apply for participation in this symposium, especially those using cutting-edge techniques or new perspectives on the study of this topic.

# Symposium S21

Avian Neurosteroids: Biosynthesis and Biological Action

Convenors:

Kazuyoshi Tsutsui  
Department of Biology, Waseda University  
Center for Medical Life Science of Waseda University  
2-2 Wakamatsu-cho, Shinjuku-ku, Tokyo 162-8480, Japan

Barney A. Schlinger  
Department of Integrative Biology and Physiology  
University of California-Los Angeles  
610 Charles E. Young Dr. East  
Los Angeles, CA 90095-7239, USA

Symposium description:

The brain was widely recognized as a target site of peripheral steroid hormones. Steroids supplied by peripheral steroidogenic glands regulate a variety of important brain functions during development, as well as in all adult vertebrates. Because they are lipid-soluble, peripheral steroid hormones cross the blood-brain barrier to act on neural tissue through intracellular receptors that regulate the transcription of specific genes. Thus, peripheral steroids, including the gonadal sex steroids, have profound effects on vertebrate behavior. Of all vertebrates, birds contributed enormously to our understanding of the mechanisms of steroid actions on reproductive behaviors, such as courtship, copulatory, aggressive and parental behaviors. In the past twenty years, this set of classical concepts has shown that, in birds, the brain itself can synthesize steroids from cholesterol through mechanisms at least partly independent of peripheral steroidogenic glands. These steroids, synthesized de novo in the central nervous system, are called "neurosteroids". Their discovery in the avian brain has expanded our appreciation for the sources of active steroidal molecules, the time-course of their actions on brain and the kinds of brain functions on which steroids have significant functions. Studies of avian neurosteroids are currently an area of great interest to many ornithologists. This symposium will highlight current knowledge regarding the biosynthesis and biological actions of neurosteroids in the avian brain.

# Symposium S22

Sensory and molecular genetics mechanisms of migratory traits

Convenors:

Miriam Liedvogel

Molecular Ecology and Evolution Lab, Department of Biology, Lund University, 223 62 Lund, Sweden.

Dmitry Kishkinev

Department of Integrative Biology, University of Guelph, N1G 2W1 Guelph, ON, Canada.

Symposium description:

Bird migration is not only a fascinating phenomenon per se, but also represents an example of a highly adapted phenotype that is regulated by fine-tuned sensory and genetics mechanisms. To a large extent, these mechanisms still remain unknown. Migratory birds follow an innate migratory programme to find their way between breeding and wintering grounds. They accomplish this challenge with amazing precision by make use of natural reference cues, like the sun, stars, the Earth's magnetic field, olfactory cues and landmarks to find their way.

What is the underlying genetic architecture that determines in which direction(s) and how long a migratory bird migrates to successfully reach wintering grounds and return back to breeding range to give birth for the next generation? Which sensory systems are involved in avian navigation and compass orientation? How is information from different orientation cues integrated? In the last 10-15 years, the body of studies in this field has increased rapidly. At the same time, experimental data usually get published years after they have been collected. The objective of this symposium is to give a detailed overview about the latest progress in understanding of sensory and behavioral mechanisms of orientation and navigation, as well as their underlying genetic architecture.

# Symposium S23

Avian brood parasitism - novel findings and new puzzles

Convenors:

Fugo Takasu

Department of Information and Computer Sciences, Nara Women's University  
Kita-Uoya Nishimachi, Nara 630-8506, Japan

Jin-Won Lee

Korea Institute of Ornithology, Kyung Hee University  
Hoegi 1-dong, Dongdaemoon-gu, Seoul 130-701, Korea (ROK)

Symposium description:

Avian brood parasites explore parental care of their hosts at the expense of the host reproductive success. In such parasitic interactions we expect that hosts will evolve defense against parasitism while parasites will counter the host defense, which further invokes host defense in different forms. Avian brood parasitism has been thought as an ideal system to study co-evolutionary interactions because the cost-benefit consequences of the parasite and the host reproduction are direct and easy to quantify.

Although this co-evolutionary view has been largely supported by empirical studies conducted in the past decades, recent advance of the study on avian brood parasites has brought us an array of novel findings and new puzzles which defies rational explanations, i.e., lack of apparently adaptive traits/behaviors, polymorphism of egg morphs, host manipulation by parasitic chicks, host cognitive mechanisms to detect parasitism which seems maladaptive, etc.

In this symposium we aim to demonstrate audience the most recent research outputs in the last four years since IOC 2010 in Brazil and provide a place for open discussion to activate the future research to better understand parasitic interactions between avian brood parasites and their hosts.

# Symposium S24

Fire regimes and bird population responses.

Convenors:

Richard H. Loyn

Arthur Rylah Institute for Environmental Research,  
Department of Sustainability & Environment, PO Box 137 (123 Brown St)  
Heidelberg VIC 3084, Australia

Lluís Brotons

Department of Animal Biology, University of Barcelona, Av Diagonal 645  
08028 Barcelona, Spain

Symposium description:

This symposium considers how bird populations respond to fire regimes in forest landscapes and other habitats. It addresses topical issues in study design; implications for policy and management; long-term perspectives and the value of retrospective analysis. Biologists need to engage with policy makers and management agencies, to help shape future fire regimes under climate change to reduce human risks while conserving biodiversity. Examples are taken from landscapes in Australia, southern Europe and other places where extreme fire events have raised the profile of fire management. Birds have been valuable subjects in developing strategies for managing fire regimes to conserve biodiversity while reducing risks to people.

Severe fires have occurred recently in many parts of the world, usually in hot dry summers that may be related to climate change. This has led to intense public debate about fire management, and options to reduce risk (e.g. more planned burning), while conserving native flora and fauna. Such a balance requires strategic data on responses of birds and other biota to fire regimes. This symposium will be of interest to researchers, policy makers and land managers who may need such information to manage fire in their respective landscapes.



## Symposium S25

Developmental stress beyond bird song: Can early life stressors engineer physiology and behavior for harsh environments?

Convenors:

Kendra Sewall  
Biology Department  
Virginia Tech Box 0406  
Blacksburg, VA 24061

Britt Heidinger  
Biodiversity, Animal Health & Comparative Medicine  
University of Glasgow  
Glasgow, G12 8QQ

Symposium description:

The developmental stress hypothesis posits that male bird song is an honest signal of developmental history, and thus quality, because song learning is vulnerable to early life perturbations. Although research has shown that early life stressors can negatively impact sexual ornaments such as bird song, little is known about their impacts on non-sexual traits that influence fitness. While early exposure to stressors is known to affect diverse behavioral, physiological, and morphological traits, there are few predictions about which traits should be relatively more impacted by or buffered from early stress, nor how this should vary among species. Further, the developmental stress hypothesis has not been fully integrated with research from the broader field of phenotypic plasticity. Specifically, some phenotypic plasticity 'matching' models predict that exposure to developmental stressors can engineer individuals to better cope with harsh environments. If so, the fitness consequences of early stress exposure will depend on the environmental context in which they are measured, which has seldom been considered in avian research on developmental stress. This symposium will review research on the impacts of early life stressors on traits other than bird song and strengthen the conceptual links between research on the developmental stress hypothesis and phenotypic plasticity.

# Symposium S26

Plasticity in birdsong production

Convenors:

Roderick A. Suthers  
Indiana University, Jordan Hall, Bloomington, IN 47405, USA

Kazuo Okanoya  
Department of Life Sciences, Graduate School of Arts and Sciences,  
The University of Tokyo, 3-8-1 Komaba, Meguro-ku, Tokyo 153-8902, JAPAN.

Symposium description:

Song is a major means of avian communication. It has a crucial role in many aspects of bird behavior, including mate selection and territorial defense. This symposium will focus on some recent developments in our understanding of the mechanisms and limitations of vocal performance, including the importance of neural and vocal plasticity and stereotypy in the function, structure and evolution of song. The symposium aims to provide an updated view on peripheral and central mechanisms of birdsong production. Peripheral and central mechanisms are often separately treated in most meetings and symposia. By putting researchers in song peripheral production and song motor control together, we aim to extend our understanding in the nature of vocal plasticity in songbirds.

# Symposium S27

Non-native birds as natural experiments: ecological and evolutionary change during biological invasions.

## Convenors:

Diederik Strubbe

Evolutionary Ecology Group, Department of Biology, University of Antwerp, Middelheimcampus GV310, Groenenborgerlaan 171, 2020 Antwerpen, Belgium

Darius Stiels

Zoological Research Museum Alexander Koenig, Section Ornithology, Adenauerallee 160, D-53113 Bonn, Germany

## Symposium description:

Invasions of non-native species are considered a substantial threat to biodiversity, but also provide researchers with numerous unplanned and frequently replicated experiments that can be used to better understand ecological and evolutionary processes. Due to the large amount of historical data on bird introductions, analyses of non-native bird occurrence have already contributed significantly to our knowledge about the invasion process. For example, bird introductions have been instrumental in showing that propagule pressure (i.e. the number of individuals introduced) is a crucial determinant of invasion success, often overwhelming biotic and abiotic constraints on species' establishment. Yet, as is true for invasion biology in general, most research on non-native birds has focused on the first stages of the invasion process only (i.e. introduction and establishment). In this symposium, we focus on what happens when non-native birds have established self-sustaining populations. Specifically, we review how birds can be used to gain knowledge about the contemporary evolution of non-native species in their new range and discuss how species introduction and subsequent spread results in patterns of non-native species richness.

# Symposium S28

Avian cognition in natural populations

Convenors:

Sang-im Lee  
Institute of Advanced Machinery and Design  
Seoul National University  
56-1 Shillim-dong Kwanak-gu, Seoul  
Korea

Piotr Jablonski  
Centre for Ecological Research  
Polish Academy of Sciences  
Ul. M. Konopnickiej 1  
Dziekanów Leśny  
05-092 Łomianki  
Poland

Symposium description:

Most studies in classical avian cognition use caged birds or birds in captivity. However, in recent years an increasing number of studies on wild birds address questions typical for animal cognition. Although captive settings may provide controlled environment that is easier to manipulate, the natural environment that wild birds experience and interact in their daily lives presents problems that are much more complex and diverse. Thus, the understanding of cognitive properties of birds obtained from captive settings may not fully represent the actual complexity and flexibility of the cognitive processes that are happening in the wild. The goal of this symposium is to provide an overview of the direct empirical (rather than literature based metanalyses) studies that fit the following criteria: (a) are conducted on wild birds in their natural habitats rather than in cages, aviaries, or any seminatural settings, (b) address questions within fairly broadly defined cognition. This involves, among others, basic perceptual processes and perceptual mechanisms on objects and the surroundings, learning, memory, social cognition, culture, etc. The objectives of this symposium are to stimulate interests in studies in the wild, to identify their importance, and to point out approaches unique for such studies. The two keynote presentations are designed to focus on two complementary research approaches: proximate (Jablonski) and ultimate (Morand-Ferron) aspects. We hope that this symposium will stimulate an exchange of ideas between ornithologists with various research approaches and traditions.

# Symposium S29

The value of long-term ringing data in ornithology

Convenors:

Ommo Hüppop  
Institute of Avian Research "Vogelwarte Helgoland"  
An der Vogelwarte 21  
D-26386 Wilhelmshaven, Germany

Nikita Chernetsov  
Biological Station Rybachy, Zoological Institute  
199034 St. Petersburg, Russia

Symposium description:

Long-term data from ringing stations provide valuable insights into different aspects of ornithology. Bird observatories in both Europe and North America have caught, ringed and measured birds - notably passerines and other small birds - for long periods, from half a century up to more than 100 years under fairly constant and comparable conditions and effort. Our symposium will bring together people from these ringing stations with a long history in bird ringing such as Rybachy and Helgoland. We aim to focus on a range of population dynamic questions (e.g. reproductive success, density dependent effects, intra- and interspecific competition, survival) and on impacts of environmental change beyond the by now well known climate-change effects on phenology (e.g. effects on biometrics and body condition). At this stage in time, after ongoing climate and global change effects haven't taken place, the 26th IOC offers a unique opportunity to throw new light on these data and to test a broad spectrum of hypotheses underlying the observed changes in avian biology. An especial chance (and challenge) will be the integrated use of the huge sets of data collected over long periods and a large variety of species to test these hypotheses.

# Symposium S30

Ecophysiology of Circannual and Long-term Timing Mechanisms: Recent Advances

## Convenors:

Asha Chandola-Saklani  
School of Biosciences  
Apeejay Stya University, Gurgaon, Haryana, India

Barbara Helm  
Institute of Biodiversity, Animal Health and Comparative Medicine  
Graham Kerr Bldg, University of Glasgow, UK - Glasgow G12 8QQ

## Symposium description:

Reproductive success and survival of birds commonly depend on adequate timing of life-cycle events relative to the cyclically fluctuating environment. Breeding should coincide with the most appropriate food supply for the upbringing of offspring, moult should occur during a sufficient phase of residency, and migration must be timed so that birds reach their breeding and wintering grounds at correct times of year. These activities typically require preparation well in advance. The main challenges the bird faces are therefore, 1. to adjust activities to the seasonally fluctuating environment, 2. to preclude or minimize simultaneous occurrence of energetically expensive seasonal events like reproduction, fattening, molting or migration, and 3. to anticipate appropriate times of year using cues and long-term timing mechanisms. How does the bird meet these challenges?

Since the times of Baker, Marshall, and Dolnik an enormous literature has established photoperiod as a proximate cue for timing in temperate zone birds. Photoperiod is used in combination with long-term timing mechanisms, which in some species continue under constant conditions as circannual rhythms. In the tropics, almost all bird species investigated were also found to be photosensitive. Yet because of the small amplitude of the annual photocycle and arguably less predictable seasonality it was debated whether tropical birds could depend on this cue, often even ignoring some experimentally sound evidence. Instead, flexibility in response to environmental factors like food or rain, complete absence of seasonality, or circannual rhythms were considered more plausible in these species. Recent studies point to a continuum of cue-use in birds across the tropics and higher latitudes. Depending on species biology, photoperiod can play a major role, circannual rhythms can be strongly developed, or direct environmental effects may be prevalent. Tropical species, however, may use photic cues in previously undescribed ways. However in birds the modus operandi of circannual clocks and their interaction with the environmental photocycle is far from clear.

The goals and objectives of this symposium shall be an overview of long-term timing mechanisms in tropical and temperate-zone birds, integration of photoperiodism with circannual approaches, and identification of the ways ahead in the light of recent data from birds and other taxa.

# Symposium S31

Birds in space: is individual variation relevant?

Convenors:

Niels Dingemanse

Behavioural Ecology, Department Biology II, Ludwig-Maximilians University of Munich,  
Planegg-Martinsried, Germany

Pim Edelaar

University Pablo de Olavide, Ctra. Utrera km. 1, ES-41013 Sevilla, Spain.

Symposium description:

In a world that is rapidly changing spatially due to habitat fragmentation and changes in climate and land use, a deeper understanding of spatial population processes is highly relevant. It is increasingly suggested that the incorporation of individual variation in dispersal theory could lead to novel predictions about movement and dispersal of individuals, population abundance and meta-population dynamics, rates of range expansion and biological invasion, and levels of population divergence and local adaptation. This symposium focusses on the importance of individual variation for spatial population processes. We aim to present studies that have investigated ecologically relevant aspects of individual variation in dispersal such as morphology, physiology, behaviour or genotype, and studies that have evaluated how this variation has (or has not) impacted upon the distribution of individuals and the composition of populations. Preferably, these studies also address or speculate about the long-term demographical, ecological or evolutionary consequences of individual variation in spatial distributions. By doing so, we aim to stimulate further empirical and theoretical integration between individual variation and population level processes in a spatial setting.

## Symposium S32

Lifetime fitness and environmental stressors

Convenors:

Mary Ann Ottinger  
Department of Animal and Avian Sciences  
University of Maryland, College Park, MD 20742, USA

Olivier Chastel  
CNRS-Centre d'Etudes Biologiques de Chizé  
79360 Villiers en Bois, France

Symposium description:

There are many environmental challenges facing wild bird populations, not the least of which are environmental chemicals and climate related changes in habitat. A growing number of long-term studies in a variety of birds provide valuable insights into species and habitat specific differences. Our overall objective is to consider these long-term studies and banding databases in combination with information on the incidence of environmental chemicals. This will provide the foundation to begin to model the potential impacts of exposure with observed effects on both individuals and populations. We have three goals: 1) provide an overview of the long-term studies of selected avian populations that encompass longitudinal data with insights into fitness of the individuals, and 2) assess the current and future risks to avian populations in the context of environmental chemicals, especially endocrine disrupting compounds, and 3) integrate the potential and realized impacts of climate change on avian populations.



# Symposium S33

Departure decisions in nocturnal migrants

## Convenors:

Heiko Schmaljohann  
Institute of Avian Research "Vogelwarte Helgoland"  
An der Vogelwarte 21, 26386 Wilhelmshaven, Germany

Arseny Tsvey  
Biological Station Rybachy of the Zoological Institute  
Russian Academy of Sciences, Universitetskaya nab. 1, 199034 St. Petersburg, Russia

## Symposium description

The seasonal ecological fluctuations between the hemispheres are a strong force in forming migration, resulting in extraordinary long-distance journeys. These journeys are covered by migratory flights each followed by a resting and re-fuelling phase. A considerably higher proportion of time and energy is allocated to stopovers than to flight stages, because fuel accumulation during stopover is much slower than energy expenditure during flight. This indicates that migrants' behaviour at a stopover site is crucial for the understanding of movement ecology. Here we will identify internal and external factors influencing the individual momentary departure decision of nocturnal migrants from a stopover site at the day-to-day level and on the level of the night. For that we need first to define what are migratory departures and how can they be distinguished from nocturnal explorative flights and/or nocturnal displacements.

The environmental cues, e.g., wind and temperature, are together with food availability determining bird's fuel deposition rate the key factors regulating the day-to-day departure decision. Depending on the environment ahead birds might adjust their flight direction to circumvent ecological barriers or to cross the barrier when conditions are favourable for such flights. We will here emphasize the individual phenotypic response to varying environmental conditions in respect of migrants' departure decision.

To date we still lack information on the individual nocturnal departure times of migratory songbirds. This information is, however, crucial as it determines the potential nocturnal flight duration. Early nocturnal take-off and flight until sunrise maximizes migrants' nocturnal travel range which, as a seasonal average, defines the overall number of stopovers during migration. As more time is spent on the ground than flying the total number of stopovers significantly contributes to the overall speed and costs of migration. However, information on whether nocturnal departure times might be organized with respect to the length of the night and whether remaining migration distance might influence the nocturnal departure time is lacking. Individual-based studies, most from the temperate zone of Europe, demonstrated a surprisingly wide scatter of nocturnal departure times. Most of the nocturnal departure times were manually radio-tracked, but automated tracking stations will provide more data and insight into the organization of the nocturnal departure times.

The aims of this symposium are bringing together scientists working on departure events with migrants, summarizing the status quo of what we know about this topic and setting future hypotheses to incorporate our work within the framework of movement ecology.

# Symposium S34

Effects of radiation on birds and other organisms: Chernobyl, Fukushima and beyond

Convenors:

Keisuke Ueda  
Laboratory of Animal Ecology  
Rikkyo University.  
Nishi-ikebukuro 3-34-1, Toshima-ku, Tokyo 171-8501,  
Japan

Anders Pape Moller  
Laboratoire Ecologie, Systematique et Evolution  
UMR 8079 CNRS-Universite Paris-Sud XI-AgroParisTech  
Batiment 362 Universite Paris-Sud XI  
F-91405 Orsay Cedex

Keynote speakers:

Symposium description:

The Fukushima disaster provides a unique opportunity to investigate the immediate, short- and long-term effects of accidental exposure to radioactivity on free-ranging organisms such as birds, which are among the most radiosensitive wildlife groups. In addition, physiological and behavioral traits provide some of the best information about the real-time, dynamic responses of organisms to their environment. We examined the impact of chronic, natural range exposure to ionizing radiation on birds at the individual level, by assessing key physiological and behavioural factors that may underlie their radio-sensitivity. These effects varied with levels of radiation exposure in a dose-dependent. This can provide important evidence of radiation exposure effects not only for birds, but also relevant for people living in contaminated areas. We believe that this theme is most timely because the Fukushima nuclear catastrophe offers the scientific community a unique opportunity to study the effects of radiation on wildlife under natural conditions. The worst nuclear disaster in history, which occurred in Chernobyl, has been extensively studied in ecophysiological and evolutionary contexts, but research was largely absent during the first ten years following the disaster. We collected much data about radiation exposure effects on birds almost immediately after the Fukushima disaster. So, we can compare the effects of contamination between Fukushima and Chernobyl. Everybody who likely to be interested in our theme for scientific, societal or personal reasons will be welcomed.

# Symposium S35

Lifelong individual development as an important component of life history

Convenors:

Peter H. Becker

Institute of Avian Research, "Vogelwarte Helgoland", An der Vogelwarte 21, D-26386  
Wilhelmshaven, Germany

Hugh Drummond Durey

Departamento Ecología Evolutiva, Instituto de Ecología, UNAM AP 70-275, México, D.F.  
04510, México

Symposium description:

To date the significance of lifelong ontogeny has been underestimated or even neglected, mainly because adequate data were lacking to address this topic.

Individual-based long-term studies, innovative field techniques and modern statistical approaches nowadays are providing relevant data. Recent findings show that individual change over the lifespan is a ubiquitous phenomenon in both long- and short-lived bird species, but little is known about the extent to which rates of change vary among individuals or about causes and consequences of such variation. Change with age occurs not only in reproductive traits but also in survival and physiological characters, timing of arrival and laying, foraging and behaviour, and this change needs to be recognized by researchers. Physical and social environments experienced in infancy, improvements early in the breeding career and senescence with advancing age can have far-reaching impacts on individual life trajectories, fitness and demography. Ontogeny in combination with selection shapes the part of the population that produces the next generations. The symposium aims to integrate measures of ontogeny and to address their role in life history. Exciting new findings from longitudinal studies of natural populations will be presented with the aim of understanding the constraints and adaptive processes of ontogeny, thereby throwing new light on the evolution of life histories in birds.

# Symposium S36

Colour polymorphisms

Convenors:

Alexandre Roulin

Department of Ecology and Evolution, University of Lausanne, Switzerland

Andy T.D. Bennett

Centre for Integrative Ecology, Deakin University, Australia

Symposium description:

Colour polymorphisms – defined as the presence of two or more colour morphs in individuals of the same age, sex and population, with the least frequent morph at a rate too high to be maintained by mutation alone – are found in many bird families. Although the maintenance of colour polymorphisms has been a topic of interest since the time of Darwin, the number of studies has sharply increased recently. This renewed interest is explained partly by the fact that coloration can be used as a phenotypic marker of genetic strategies, and partly by recent methodological and conceptual advances. The aim of this symposium will be to review the latest advances in our understanding, focusing on the adaptive function of colour polymorphisms, and its underlying genetic basis and evolutionary consequences.

# Symposium S37

Genomes and the evolution of modern birds

Convenors:

Jon Fjeldså

Center for Macroecology, Evolution and Climate, University of Copenhagen  
Universitetsparken 15, DK-2100 Copenhagen, Denmark.

Erich Jarvis

Department of Neurobiology, Box 3209, Duke University Medical Center, Durham, North Carolina 27710, USA.

Symposium description:

Because of the substantial knowledge of the global avifauna, birds have been used extensively as a model group for analyzing evolutionary and ecological questions of great generality. However, this work remains hampered by uncertainties and controversies that, despite great advances in molecular phylogenetic studies, surround the phylogenetic relationships among the major groups of living birds. In particular, evolutionary patterns and processes operating within the radiation of the Neoaves remain poorly known, including whether the divergence rate peaked before, during or after the end-Cretaceous extinction events, and how the early history of extant birds relates to earth history events.

To address these and other issues in biology, we recently organized an international consortium of persons to sequence the genomes of all 10,400 living and some extinct bird species, called the Bird 10K (B10K) project. This includes accessing the world's largest collections of frozen tissue samples, including collections in the Americas, Europe, Asia, and Australia, and assembling leading experts in sample curation, genomics, phylogeny, and trait genetics. BGI in China is sponsoring sequencing of many of the genomes, and many other institutions are sponsoring collecting samples and data analyses. We have completed the sequencing of the first 48 genomes (including the published chicken, turkey, and zebra finch genomes) that have at least one species each that span all major avian lineages.

In this symposium, we will update the progress of the B10K project, the phylogenomics of the major orders of birds, and new discoveries being made in biology using genome-scale data for birds. The data provide a robust comparative framework for studying the natural history of genome evolution in birds, and the genetic basis for the evolution of diverse traits, ranging from different forms of development to feeding specializations, cognition and vocal learning. The preliminary data are revealing support for some prior controversial species relationships, as well as bringing up new controversies and possible signatures of convergence in some regions of the genome. The symposium will also include presentations of visions for the further development of genomics in ornithology.

# Symposium S38

Evolutionary Morphology of Birds: New Methods and Concepts

Convenors:

Andrei V. Zinoviev

Department of Zoology, Faculty of Biology, Tver State University, Tver 170002, Russia.

Dominique G. Homberger

Department of Biological Sciences, Louisiana State University, Baton Rouge, LA 70803,  
USA

Symposium description:

Functional morphology of birds has experienced an exciting revitalization through advances in several areas. For example, the continuing discovery of ever larger numbers and species of fossil birds has completely changed our understanding of avian diversity and evolution from what it was three decades ago. The technique of 3D imaging and animation based on x-ray CT scans has opened new avenues for the study and explanation of avian functional morphology and biomechanics. And morphology has become a tool for trying to understand the influence of environmental factors on the development of structures and their functions. These advances, used by themselves or in combination, allow for a better understanding of evolutionary trends and transformations in birds. The symposium aims at introducing a non-specialist audience to the exciting developments in avian morphology and is expected to attract a broad variety of ornithologists, while also serving as a focal point for the relatively small worldwide community of morphologists to interact.

# Symposium S39

Ethno-ornithology: Birds, Culture & Conservation

Convenors:

Andrew G Gosler

Edward Grey Institute of Field Ornithology & Institute of Human Sciences, Oxford, UK

Robert Gosford

Centre for Resource and Environmental Studies, Australian National University, Canberra  
ACT

Australia

Symposium description:

Birds feature in the folklore of every human culture in the world; the conservation community has barely realized the practical significance of this. Ethno-ornithology embraces the rich research interests of human culture (linguistic, social and cognitive anthropology) and birds (ornithology and ecology). It seeks to describe and understand the diverse relationships that exist between humans and birds. Within a broader framework of ethno-biology, it has contributed to the anthropological understanding of human cognition and, in practice, ethno-ornithology is contributing to policy formation on global issues as diverse as nature and language conservation, human conflict resolution and peace-building. The reasons for this are complex, but some relevant issues are: a) the benefits of human connection with nature are well attested, and deprivation of such links compromise health and social cohesion; b) socio-cultural developments and growing urbanization mean post-industrial humans are more disconnected from nature than any people in history, a fact which can lead to irrational fears and/or misunderstandings of nature; c) irrespective of their material utility, like humans, most birds are active, inquisitive, vocal, colorful, diurnal and non-threatening, but they also fly! They appear to us as subjects, rather than objects, in the landscape, and consequently birds impress upon the human psyche more than do any other vertebrates. For many people, therefore, birds are not only the first wild creatures encountered, but they are also the most significant.

# Symposium S40

Turning the tide for East Asia's migratory shorebirds

Convenors:

Jutta Leyrer

Centre for Integrative Ecology, School of Life & Environmental Sciences, Deakin University,  
Locked Bag 20000 Geelong VIC 3220, Australia

Zhijun Ma

Institute of Biodiversity Science

School of Life Sciences, Fudan University No. 220 Handan Road, Shanghai, 200433, People  
Republic of China

Symposium description:

Shorebirds perform some of the most amazing feats of migration, travelling hundreds of thousands of kilometres in their lifetimes. Yet their populations and the wetland habitats on which they depend are under threat. The situation is particularly serious in the East Asian – Australasian Flyway, where according to a recent IUCN situation analysis, migratory shorebird populations are declining by 5-9% per year. Recent analyses of satellite data have revealed rapid rates of coastal habitat loss across the region, and there is an urgent need to identify robust and workable conservation solutions.

This symposium will bring together ecologists and conservation scientists to showcase the latest developments in our understanding of the biology of migratory shorebirds in East Asia, and identify solutions for their conservation. Recent revelations from satellite telemetry about migration routes are challenging us to think in new ways about achieving conservation of these species that regularly cross international borders. International co-ordination is likely to be essential if we are to turn the tide for migratory shorebird populations in East Asia and elsewhere around the world.



# Symposium S41

Persistent organic pollutants - lasting problems and new aspects in migratory birds

Convenors:

Maris Strazds  
University of Latvia, Riga

Anders Bignert  
Swedish Museum of Natural History, Stockholm, Sweden

Symposium description:

Contamination research first became an important topic for the I.O.C. in Amsterdam in 1972, only ten years after publication of R. Carson's book "Silent Spring". Much knowledge has accumulated since then on the impact of persistent organic pollutants on the environment and birds, and on the physiological mechanisms involved. Costly monitoring programmes in most of the countries affected had resulted in hundreds of studies following the developments of contamination rate, most of them indicating an improvement of the situation. However, although the use of DDT was banned in many countries its production was not. The World Health Organization has even recommended its use in disease vector control by "indoor residual spraying" as recently as in 2006. A possible consequence of this situation is the production recently of data suggesting that a new wave of DDT (DDE and metabolites) contamination might be "on the way". Species wintering in Africa are affected most so far and are of current concern, including the Black Stork, Lesser Black-backed Gull, European Roller. Our symposium will try to summarize lessons from the past and discuss to what extent the recent developments represent a case of "history repeating". We aim also to discuss which aspects in contamination transport via wintering and migration are new and how to handle them in bird conservation.

## Symposium S42

Nutritional satisfaction: new perspectives on how birds acquire necessary energy and nutrients

Convenors:

Dr. Scott McWilliams

Department of Natural Resources Science, University of Rhode Island  
105 Coastal Institute, 1 Greenhouse Way, Kingston, Rhode Island, 02881 USA

Dr. William Buttemer

Centre for Integrative Ecology, Deakin University  
Geelong, Victoria 3217, Australia

Symposium description:

All birds must acquire necessary energy and nutrients while avoiding being eaten. Studies of food relations and the underlying dynamic flow of energy and nutrients between organisms have been centrally important for our understanding of animal ecology, from the individual to ecosystem levels. This symposium focuses on new and emerging perspectives on the nutrient requirements of birds in relation to their ecology and life history. It will identify novel ways in which birds acquire food (e.g., biofilm), novel mechanisms for how birds assimilate nutrients, and how birds dynamically modify their diets to satisfy changes in energy and nutrient requirements.

# Symposium S43

Ecological immunology at 30: a midlife crisis or newfound opportunity?

Convenors:

Kirk C. Klasing  
Department of Animal Science  
University of California  
Davis One Shields Avenue, Davis, CA 95616  
US

Kevin D. Matson  
Animal Ecology Group  
University of Groningen  
PO Box 11103  
9700 CC Groningen NL

Symposium description:

Over thirty years have passed since Hamilton and Zuk first published their well-known hypothesis, which is sometimes seen as launching the field of ecological immunology. At first, interests in immunology by ecologists remained grounded in the realm of behavior. These interests, however, have diversified rapidly. Ornithologists began measuring and integrating multiple immunological parameters to better describe the immune systems of wild birds. Now, as ecological immunology continues to mature, an ever greater emphasis is being placed on understanding the roles of related physiological systems and life history variables along with the effects of varied environmental and ecological factors, such as disease communities. In this symposium, we endeavor to highlight the breadth of contemporary research in ecological immunology. We hope to illustrate the field's vitality by offering a forum for presentations that link immunology to widest possible range of domains, including microbial-, disease-, physiological- and community ecology.

# Symposium S44

New finds and old bones – integrative palaeornithology for the 21st century

Convenors:

Gerald Mayr

Senckenberg Research Institute Frankfurt, Ornithological Section

Senckenberganlage 25, 60325 Frankfurt am Main, Germany

Xu Xing

Institute of Vertebrate Paleontology, Beijing, China.

Symposium description:

Not least due to the spectacular new finds from the early Cretaceous of China, fossil birds have attracted much attention outside the narrow circle of specialists in the past decades. Still, however, the significance of palaeornithology for an understanding of modern birds is not always fully appreciated and this is true for both, Mesozoic and Cenozoic representatives. Fossil birds are not only requisite for the calibration of molecular phylogenies, but also contribute to an understanding of historical biogeography and provide the only available data on character evolution in birds. Knowledge of the diversity of the theropod ancestors of birds can help to trace the evolution of major bird characters, including feathers, wings, and even some behavioral traits, and there are many other aspects, in which fossils are of significance for an understanding of present bird communities. The symposium aims to present new results concerning both Mesozoic and Cenozoic fossil birds for a non-specialist audience. Although emphasis is put on overview talks that put the past avian diversity in a perspective relative to that of their modern relatives, submission of contributions on all aspects of palaeornithology is encouraged.

# Symposium S45

Avian phylogenetics: advances in understanding of Old World passerine evolution

Convenors:

Alice Cibois  
Department of Mammalogy and Ornithology  
Natural History Museum of Geneva  
CP 6434  
1211 Geneva 6, Switzerland

Shao-Hsien Li  
Department of Life Science  
National Taiwan Normal University  
88 Ting-Chow Rd, Sec 4  
Taipei, Taiwan, 116

Symposium description:

In recent years, molecular phylogenies have greatly clarified the relationships within Passeriformes, the largest order within the Neornithes. This symposium will focus on one of the biogeographic units within Passeriformes that has been intensively studied in molecular systematics recently, the Old World passerines. This large group is an ideal case study to evaluate the impact of comprehensive phylogenies on the understanding of morphological evolution and cryptic speciation, and to assess the implication of calibrated trees for the evaluation of biogeographical scenarios.

# Symposium S46

Recent insights on sexual selection from avian models

Convenors:

Patricia L. R. Brennan  
Department of Biology  
UMASS Amherst

Richard O. Prum  
Department of Ecology & Evolutionary  
Yale University

Symposium description:

Avian research has contributed greatly to the development of theories of sexual selection in the past few decades. Despite the growing number of sexual selection studies, the field is still young, and many recent attempts have been made at revising basic theoretical assumptions, and to encourage research in new areas that can help move the field forward. This symposium seeks to highlight some of the exciting advances in the field that have derived from avian research, as well as to highlight some systems in which the action of specific mechanisms of sexual selection is well understood. Some themes will include the relative contributions of sexual selection and ecological adaptation in speciation: a unified framework, the role of aesthetic evolution on mate choice, and how phenotypic plasticity affects theories of sexual selection.

# Symposium S47

Patterns and mechanisms of metabolic flexibility in birds

Convenors:

David Swanson, Department of Biology, University of South Dakota, Vermillion, SD 57069, USA

François Vézina, Department of Biology, University of Quebec at Rimouski, Rimouski, Quebec, G5L 3A1, Canada

Symposium description:

Phenotypic flexibility is defined as temporary, reversible changes in phenotypes allowing organisms to match phenotypes to environmental or ecological demands, such as climatic variation, migration and reproduction. One poorly known aspect of phenotypic flexibility in birds is how the capacity for phenotypically flexible responses (i.e., reaction norms) correlates with environmental variability. Symposium participants will review examples of metabolic flexibility and outline future research necessary to better understand general patterns and drivers of metabolic flexibility and to evaluate the importance of such flexibility to the evolution of avian life histories. The mechanistic bases underlying flexible metabolic phenotypes in birds are also incompletely understood. Organismal metabolic flexibility is known to involve changes in organ masses and/or changes in cellular aerobic capacity (perhaps coupled to changes in oxygen and substrate delivery pathways). Studies to date suggest variable contributions of these mechanisms in different birds and different ecological or environmental contexts. Symposium participants will discuss examples of mechanistic adjustments at the sub-organismal level and relate these adjustments to organismal metabolic flexibility. They will also discuss potential research avenues to further the mechanistic understanding of variable metabolic phenotypes.

# Symposium S48

Physiological mechanisms underlying individual variation in life-history traits

## Convenors:

Marcel E. Visser, Netherlands Institute of Ecology (NIOO-KNAW), P.O. Box 50, 6700 AB Wageningen, The Netherlands

Tony D Williams, Department of Biological Sciences, Simon Fraser University, 8888 University Drive, Burnaby, V5A 1S6, Canada.

## Symposium description:

In any population only a small percentage of individuals (< 20%) survive to breeding age and then produce offspring which themselves survive and recruit to the breeding population (Clutton-Brock 1988; Newton 1989). These few 'high quality' individuals appear to "always do better", over their whole lifetime, and over a range of environmental conditions (e.g. Hamel et al. 2009; Lescroël et al. 2009): they lay many, large eggs, with a relatively early laying date, rear large broods, and recruit more offspring, while also having higher future fecundity and survival, thus apparently 'avoiding' underlying trade-offs or costs of reproduction which would predict negative correlations between these traits. Many avian ecological and evolutionary studies therefore invoke differences in "individual quality" to explain variation among individuals in traits associated with reproduction, survival and, ultimately, fitness. While "individual quality" remains an elusive concept within ecology (Wilson & Nussey 2010), it is an even more elusive concept from a mechanistic or physiological perspective (Williams 2008, 2012).

In this symposium, we will explore the extent to which individual variation in key life-history traits, that are components of fitness (fecundity, parental care, survival) and trade-offs between traits (e.g. costs of reproduction), is associated with, and potentially caused by, individual variation in physiology. While we have a knowledge of general, physiological mechanisms underpinning some life-history traits (e.g. timing of breeding [Visser et al. 2010], ageing [Monaghan 2010]) it is less clear if these mechanisms are adequate, or can be extended, to explain individual, phenotypic variation in these life-history traits. For other life-history traits (including clutch size, and parental care) we currently lack general, physiological mechanisms to explain variation in these traits, or we have few data to support the putative, favoured mechanisms that are commonly discussed in the literature. In both ecology and physiology most studies to date have used a single trait as a proxy or indicator of "individual quality". However, it is likely that measuring multiple traits will better capture "individual quality" (e.g. Travers et al. 2010), and a focus of this symposium will be how multivariate, physiological studies of life-history traits can be designed and integrated into long-term ecological, population studies of birds.