

FishBase Symposium 2018

Fishes At Depth! / Fiskar På Djupet!

Swedish Museum of Natural History

15 October 2018



Summary



FishBase Sweden
Naturhistoriska riksmuseet
Box 50007
104 05 Stockholm
fishbase@nrm.se
08-5195 40 00

15 October 2018

Text: Respective speaker and Michael Norén, FishBase Sweden

Cover photo: Narnownose chimera, *Harriota raleighana*. NOAA Office of Ocean Exploration and Research
(<https://oceanexplorer.noaa.gov/oceanos/explorations/ex1711/dailyupdates/media/dec12-1.html>)

Other photos: Hanna Pauser Lindgren. CC-BY-SA

Published by FishBase Sweden, Stockholm.

FishBase Symposium 2018 – Fishes At Depth!

Introduction.....	4
Moderator: Inger Näslund.....	5
Imants G. Priede	6
<i>DEEP-SEA FISHES: DISCOVERY, DISTRIBUTION, ORIGINS AND DIVERSITY</i>	6
Alan Jamieson.....	7
<i>THE DEEPEST OF THEM ALL: IN SITU OBSERVATIONS OF THE WORLD'S DEEPEST FISHES</i>	7
Fanny de Busserolles	8
<i>DEEP-SEA FISH VISUAL ECOLOGY</i>	8
Jan Yde Poulsen	9
<i>GIANTS AND DWARFS – NEW SPECIES, GENERA AND FAMILIES OF FISH FROM THE DEEP-SEA</i>	9
Sarah Viana.....	10
<i>DIVING THROUGH THE GLASS – THE ROLE OF NATURAL HISTORY COLLECTIONS FOR INFERRING BIODIVERSITY KNOWLEDGE AND PROMOTING CONSERVATION OF TROPICAL DEEP-SEA ELASMOBRANCH SPECIES</i>	10
Nicolas Straube.....	11
<i>GLOW IN THE DARK SHARKS – INTERRELATIONSHIPS AND EVOLUTION OF BIOLUMINESCENT CHONDRICHTHYES</i>	11
Photos from the Symposium	12
Participant list FishBase Symposium 2018	16
FishBase Symposium 2018 — <i>Fishes At Depth!</i> – Programme.....	21
FishBase Symposium 2018 — <i>Fiskar på djupet!</i> – Program	22

Introduction

The theme for the 16th annual FishBase Symposium, held at the Swedish Museum of Natural History in Stockholm on the 15th of October 2018, was *Fishes At Depth / Fiskar På Djupet*, a reference to the deep sea. The deep sea is defined as all marine environments at greater depth than 200 meters, which is the greatest depth at which the light from the sun can sustain photosynthesis. This doesn't just mean that all energy in the deep sea has to come from primary production in shallow water, but also that all oxygen in the deep sea has to come from the surface. In addition, the deep sea is cold, with the deepest areas typically maintaining a temperature of 0 – 3 °C. Then there is the immense pressure: every ten meters of depth the pressure increases by one atmosphere, so at the average ocean depth of 4500 meters the pressure is 450 atmospheres, while at the greatest depth in the Mariana Trench it is a staggering 1100 atmospheres (for comparison, gas bottles rarely hold a pressure higher than 200 – 300 atmospheres). Several of the lectures explained how the pressure acts as a “taxonomic filter” in the deep sea, limiting the maximum depth at which different fish groups can live. The deep sea is a challenging environment for life.

To learn more about the fishes of the deep sea and their adaptations, FishBase Sweden invited six experts who gave lectures on a range of topics. Imants G. Priede introduced us to the deep sea by presenting an overview of the deep sea and its inhabitants and the evolutionary history of the deep sea fauna, while Alan Jamieson showed us some *in situ* observations of the world's deepest-living fishes. Fanny de Busserolles gave a brief introduction to the light conditions of the deep-sea environment and the visual adaptations of deep-sea fishes. Jan Yde Poulsen talked about recently discovered species from pelagic and benthic deep-sea habitats. Sarah Viana introduced us to the diversity and taxonomy of tropical deep-sea sharks and skates, and provided an outline of fish collections in Brazil. Nicolas Straube gave an introduction to the taxonomy of bioluminescent sharks and their interrelationships and evolution.



230 participants listened to six invited experts, who gave lectures on different aspects of the fishes of the deep sea. Videos of the lectures are available at FishBase Sweden's YouTube channel, FishBase's Facebook page, and the homepage of the Swedish Museum of Natural History.

Moderator: Inger Näslund

WWF Världsnaturfonden, Sweden



Inger Näslund is working as Senior Advisor for Marine & Fisheries at WWF Sweden and the WWF network since more than 15 years. Her work with fisheries policy and market related tasks as well as overarching marine biodiversity and ecosystem within the organization relates to a broad range of topics from shallow coastal waters to the deep sea.

Before joining WWF she worked with marine topics in Western Indian Ocean, Red Sea and in the Baltic Sea holding a MSc in Marine Biology and Ecology connected to Stockholm and Uppsala University. Today Agenda 2030 and SDG goal 14 is an

important platform for the WWF Marine Conservation work ranging from coastal habitats to deep sea exploitation issues.



Imants G. Priede

University of Aberdeen, UK



Imants G. Priede is Professor Emeritus at Oceanlab, in Institute of Biological and Environmental Sciences, University of Aberdeen. He has over 40 years of experience studying deep-sea fish, from longlining and trawling on the Royal Research Ship Challenger in the 1970s to participating in and leading expeditions to the Pacific Ocean, Atlantic Ocean, Mediterranean Sea and the Mid-Atlantic Ridge. The founder of Oceanlab, he also pioneered satellite tracking of sharks in the 1980s and is a recipient of the 2011 Beverton Medal of the Fish Society of the British Isles. He is now based on the island of Crete in Greece from where he edits the journal *Deep-Sea Research, Part 1*. He is author of *Deep-Sea Fishes: Biology, Diversity,*

Ecology and Fisheries, published by Cambridge University Press in 2017.

DEEP-SEA FISHES: DISCOVERY, DISTRIBUTION, ORIGINS AND DIVERSITY

Deep-sea fishes were first described scientifically by Antoine Risso (1810) with an account of their depth zonation in the Bay of Nice although some species were listed by Linnaeus (1748) but with no depth information. The circum-global voyage of the research ship Challenger (1872 – 1876) showed that fishes occur at great depths in all the oceans and the Valdivia expedition (1898 – 1899) confirmed presence of pelagic species throughout the water column from the surface to the abyss.

There are probably about 3800 species deep-sea fish. Numbers decrease with depth; Myxini down to 3003 m, Chondrichthyes to 4156 m and Actinopterygii to 8370m.

Generally, deep-sea families originated by colonisation from shallow waters, with ancient deep-sea endemic families having lost their shallow-water representatives and more recent secondary or invasive groups retaining a continuous distribution from shallow-waters to the abyss and beyond. For some groups, (e.g. Chimaeriformes, Squalimorphi and Rajidae) the deep-sea has acted as a refuge during mass extinction events. The Gadiformes appear to have originated in the deep-sea and have recently colonised shallow seas and continental shelves.

The deep-sea fish fauna is not a distinct taxonomic group but is the result of opportunistic colonisation from the numerous branches and twigs of evolutionary tree of fishes. The present-day fauna is dominated by forms that have originated over the last 100 million years since the mid-Cretaceous, coinciding with the break-up of Pangaea and opening of the Atlantic Ocean with modern global circulation.

Alan Jamieson

Newcastle University, UK



Dr. Alan Jamieson is a senior lecturer in deep-sea biology at Newcastle University, UK. He is the Chief Scientist on the 5-Deeps expedition. His research has made him a world leader in the biological exploration of the hadal zone (depths exceeding 6000 metres). He has designed multiple Hadal-Landers and has deployed them nearly 250 times in the ultra-deep subduction trenches of the Pacific Ocean and surrounding areas. He has participated in, and often led, over 50 deep-sea expeditions covering every ocean. He has published over 80 scientific papers and sole authored the book *The Hadal Zone, life in the deepest oceans*, in 2015. The highlights of his work include filming the deepest fish in the world multiple times, discovering supergiant amphipods in the hadal zone, having a hadal species named after him and filming in the deepest places on Earth, the Sirena Deep and Challenger Deep in the Mariana Trench. His work has featured in the BBCs *Blue Planet II*, and NHKs *Deep Ocean, Descent into the Mariana*

Trench documentaries, and his discoveries have received extensive international media coverage. He is a fellow of the Royal Geographic Society and currently sits on the council of the Challenger Society for Marine Science.

THE DEEPEST OF THEM ALL: *IN SITU* OBSERVATIONS OF THE WORLD'S DEEPEST FISHES

A little over 10 years ago there were no recorded images or video of fish in the hadal zone (depths exceeding 6000 metres). While we knew much about abyssal fishes, records of hadal fish were largely a collection of individual, often badly damaged, samples with often dubious depths of capture. Since 2007 over 200 deployments of baited traps and cameras have returned a wealth of new in situ observations of both lower abyssal and hadal fishes from the subduction trenches around the Pacific Rim. The research campaigns have also recovered many specimens which have proven why teleosts are limited to ~8200m and other insights in their life history, feeding habits and behaviour. This talk will focus on the families Macrouridae (rat-tails), Ophidiidae (Cusk eels) and the deepest of them all, the Liparidae (snailfish).

Fanny de Busserolles

University of Queensland, Australia



Fanny de Busserolles is a Postdoctoral Research Fellow in the Marshall Laboratory at the Queensland Brain Institute, The University of Queensland, Australia. She is originally from France where she completed her Bachelor and Master of Science. Since the completion of her PhD in December 2013 at the University of Western Australia, Fanny has held two postdoctoral research positions, one year at King Abdullah University of Science and Technology (Saudi Arabia) and her current position at the University of Queensland, Australia.

Her main research interests lay in visual ecology, sensory systems, marine biology and deep-sea ecology, biology and diversity. She is particularly fascinated by the deep-sea environment and how its inhabitants have adapted to see in dim light conditions and for viewing bioluminescence. In 2017, she was awarded an Australian Research Council Discovery Early Career Researcher Award (2018 – 2020) to continue her research on fish vision and investigate the

capabilities of teleost fish to see colour in dim conditions.

DEEP-SEA FISH VISUAL ECOLOGY

Contrary to what most people think, the deep-sea is not a completely dark environment and vision is often one of the main sense used by its inhabitants. The visual environment in the deep-sea is driven by two main sources of light, the residual downwelling sunlight present in the first 1000 m, and bioluminescence produced by the organisms themselves at all depths. However, to function in such dim conditions, the eyes of deep-sea organisms had to adapt, sometime in very extreme and surprising ways. After giving a brief introduction to the light conditions in the deep-sea environment, I will present the common visual adaptations that allow deep-sea fish to maximise photon capture and detect essential visual information. I will then focus the rest of this talk on three novel visual solutions that challenge our current views of the vertebrate visual system, as well as the ecology and behaviour of deep-sea organisms.

Jan Yde Poulsen

Greenland Institute of Natural Resources, Denmark



Jan Yde Poulsen is Research Associate at at Greenland Institute of Natural Resources. His research interests are focused on fish taxonomy and evolutionary relationships of fishes – mostly taxonomic groups that predominantly are distributed in deep-sea habitats worldwide. In addition, he has worked extensively with the fish biodiversity in subarctic Atlantic regions, with special focus on fishes off Greenland. He is currently working with morphological and molecular approaches in integrative taxonomy and evolutionary biology, employing for example CT-scanning and molecular mitogenomic DNA methods and analyses. He is particularly fascinated by the evolution of deep-sea fishes, and their adaptations, such as bioluminescence, vision and sexual dimorphism, to mention a few.

GIANTS AND DWARFS – NEW SPECIES, GENERA AND FAMILIES OF FISH FROM THE DEEP-SEA

The deep-sea pelagic and benthic areas constitute some of the largest and most unknown habitats on the planet Earth. Therefore, a vast number of new species from the deep-sea realm is often assumed to be present. However, descriptions of new fish taxa from the deep-sea are relatively few at present in the context of other habitats. Many deep-sea taxa are small and fragile although notable exceptions are present – one recently discovered and presented in this talk – indicating that rarity, traditional collecting methods and preservation dilutes taxonomy on deep-sea fishes.

This presentation focuses on recently discovered results from the mesopelagic (200 – 1000 m), the bathypelagic (1000 – 4000 m) and the bathybenthic habitats. It includes newly discovered dwarf-like taxa such as bioluminescent mirrorbellies in the family Opisthoproctidae, a new giant genus of slickheads in the family Alepocephalidae, and also rearrangement of deep-sea pelagic eel families and their leptocephalus larvae. Ontogeny is an interesting although poorly known part of deep-sea fish taxonomy, and recently discovered examples are included in the tubeshoulder family Platytroctidae and in the monotypic pelagic eel family Neocyematidae.

Sarah Viana

South African Institute for Aquatic Biodiversity, South Africa



Sarah Viana is a Brazilian marine fish taxonomist with a PhD in Zoology from the University of São Paulo and currently a Research Associate at the South African Institute for Aquatic Biodiversity. Her research focuses on the systematics, evolution and conservation of sharks and batoids from South American and African waters. She has dedicated 10 years of her life towards intensive work in fish collections from Latin America, North America, Europe, Asia, Africa and Oceania to elucidate taxonomic problems related to deep-sea species, especially spiny dogfish sharks. Her current research interests include molecular taxonomy, population and conservation genetics and phylogeography of targeted, endemic and non-charismatic species.

DIVING THROUGH THE GLASS – THE ROLE OF NATURAL HISTORY COLLECTIONS FOR INFERRING BIODIVERSITY KNOWLEDGE AND PROMOTING CONSERVATION OF TROPICAL DEEP-SEA ELASMOBRANCH SPECIES

Deep-sea elasmobranchs inhabit upper continental slopes to abyssal basins in all oceans ranging from depths of 200m to over 3000m. Deep-sea species include catsharks, dogfish sharks and skates that together comprise the largest and most diverse taxa within the Chondrichthyan fishes.

In the South Atlantic and Western Indian Oceans deep-sea sharks and batoids are often targeted in commercial and artisanal fisheries. Severe overfishing in these regions currently jeopardizes the survival rates and upturns the extinction risks of deep-water elasmobranchs as fisheries efforts increase in the abyssal realms. Many species thus are likely to remain undescribed with the environmental collapse. Inability to identify taxa is observed in tropical and subtropical countries such as Brazil, Mozambique, Madagascar and South Africa where misidentifications and taxonomic uncertainties are still often met. Deficiency of tropical deep-sea research reveals the taxonomic impediment that includes the decline of scientific expeditions, academic funding and infrastructure, and shortage of experts as major drivers. The impediment thus has shaped the known biodiversity and conservation efforts of tropical elasmobranchs. The combined impediment and rarity of some species makes natural history collection data the backbone for inferring classification and promoting management of endangered species in these countries.

In this talk, I will first introduce the diversity of tropical deep-sea elasmobranch and later I will provide evidence of recent outputs in taxonomic research using spurdogs, gulper sharks, roughsharks, ribbontail catsharks and deep-water skates as examples. I will also provide an outline of fish collections in Brazil and discuss initiatives to improve research with deep-sea sharks and batoids.

Nicolas Straube

Bavarian State Collection of Zoology, Germany



Dr. Nicolas Straube is an ichthyologist and molecular systematist, and a postdoctoral fellow at the Bavarian State Collection of Zoology, Germany. He specializes in uncovering the relationships and evolution of deep-sea sharks, and is currently working on a project to extract and sequence DNA from formalin-preserved shark specimens in Natural History museum collections.

GLOW IN THE DARK SHARKS – INTERRELATIONSHIPS AND EVOLUTION OF BIOLUMINESCENT CHONDRICHTHYES

My research foci lie on deciphering the phylogeny and systematics of deep-sea sharks, where I am making use of morphological and phylogenomic methods to explore adaptation, diversity, phylogeography and population structures in present and past. Among sharks, a noteworthy number of species has adapted to living in the deep-sea. Several of these species are bioluminescent using their light organs for camouflage and likely communication. Reconstructing the phylogenetic interrelationships is challenging, as several species are quite rare. Here, I present on latest DNA sequence-based methods for reconstructing the phylogeny of squaliform sharks comprising all luminescent taxa. With the help of phylogenetic trees, we are not only able to resolve higher-level interrelationships with confidence, but further track morphological characters available for group distinctions. Indirect evidence derived from estimated phylogenies allows for identifying luminescent organs in further shark species hitherto assumed to be non-luminescent and further, possible evolutionary scenarios can be reconstructed, which shaped the extant diversity. Scientific collections play a major role in my studies, as we are not only able to verify results from DNA based analyses on such morphological archives, but now also work on opening this archive to DNA analysis.

Photos from the Symposium



Registration



Coffee break mingle



Coffee break mingle



Coffee break mingle



Coffee break mingle



Organizers and speakers of FishBase Symposium 2018. From left: Andrea Hennyey, Sven Kullander, Alan Jamieson, Imants G. Priede, Fanny de Busserolles, Michael Norén, Jan Yde Poulsen, Nicolas Straube and Sarah Viana.

FishBase Sweden would like to thank all speakers and participants for making FishBase Symposium 2018 a success, and hope to see you all again next year at FishBase Symposium 2019!

Participant list FishBase Symposium 2018

Talare / Speakers:

Fanny de Busserolles	University of Queensland
Alan Jamieson	Newcastle University
Imants G. Priede	University of Aberdeen, Oceanlab
Jan Poulsen	Greenland Institute of Natural Resources
Nicolas Straube	Zoologische Staatssammlung München
Sarah Viana	South African Institute for Aquatic Biodiversity

Moderator:

Inger Näslund	Världsnaturfonden WWF
---------------	-----------------------

Deltagare / Participants:

Khaled Abo	Naturhistoriska riksmuseet
Ymer Alber	Atleticagymnasiet
Karin Alexandersson Ros	Stockholms universitet
Zakerie Alimire	Atleticagymnasiet
Gustaf Almqvist	Länsstyrelsen i Stockholms län
Emma Alsing Skoog	Aquaria Vattenmuseum AB
Salma Alzghoul	Atleticagymnasiet
Emilia Andersson	Stockholms universitet
Magnus Andersson	Regeringskansliet
Michael Andersson	
Gunnar Aneer	
Björn Ardestam	SLU Aqua
Anas Arshad	Atleticagymnasiet
Hedvig Avén	Marina Läroverket
Samuel Avraham	Miljöjournalist
Barbro Axelius	Stockholms universitet
Abdul Aziz Manneh	Atleticagymnasiet
Alma Bajric	Stockholms universitet
Bernt Balkh	
Göran Bardun	Stadsbyggnadsförvaltningen Tyresö kommun
Enkhjin Batjav	Atleticagymnasiet
Germund Beliaev	
Yordan Belivanov	Naturhistoriska riksmuseet
Bengt-Erik Bengtsson	Prof. emeritus ACES/SU
Kristian Benkö	Aquaria Vattenmuseum AB
Per-Arvid Berglund	Naturhistoriska riksmuseet
David Bernvi	Atleticagymnasiet
Martin Beskow	Marina Läroverket
Barbara Bland	SLU
Susanna Bogiatzis	Täby Kommun

David Boklund	Stockholms universitet
Bertil Borg	Stockholms universitet
Hans Bostrand	
Daniel Brelin	Länsstyrelsen Uppsala
Engla Bringler Blomgren	Marina Läroverket
Ellen Bruno	MSC
Lasse Byrén	Marina Läroverket
Henrik C. Andersson	
Wiktor Candlert	Stockholms universitet
Leo Carlsson	Marina Läroverket
Donglei Chen	Uppsala universitet
Fengjiao Chen	Uppsala universitet
Nichlas Dahlén	Länsstyrelsen Gävleborg
Henrik Dahlgren	Naturhistoriska riksmuseet
Staffan Danielsson	Miljö- och energidepartementet
Bo Delling	Naturhistoriska riksmuseet
Meryam Dereä	Atleticagymnasiet
Bernd Dinse	Haninge Akvarieförening
Clara Dunvret	Marina Läroverket
Adam Edström	Marina Läroverket
Filippa Ekblom	Marina Läroverket
Axel Eklund	Marina Läroverket
Esther Eklund	Marina Läroverket
Mattias Ekstedt	Aquaria Vattenmuseum AB
Fadi Elias	Atleticagymnasiet
Sabir Elmi	Atleticagymnasiet
Alexander Elvhage	
Ricky Eriksson	
Emmie Fagerberg	Stockholms universitet
Narin Fallah	Atleticagymnasiet
Suzanne Faxneld	Naturhistoriska riksmuseet
Bo Fernholm	Naturhistoriska riksmuseet
William Flach	
Johanna Fox	Naturskyddsföreningen
Martin Franzén	Akvarievärlden
Karl Fredrik Lilja Myhr	Marina Läroverket
Malin Fridström	Naturhistoriska riksmuseet
Klara Fröborg Telenius	
Fernando Garcia Herrera	Atleticagymnasiet
Angus Gauffin	Marina Läroverket
Thomas Giegold	Stockholms universitet
Karin Glaumann	WWF
Emily Gripenstam	Akvarievärlden
Kacper Grzyb	Atleticagymnasiet
Andrée Grähs	Marina Läroverket
Anas Gulled Aden	Atleticagymnasiet
Elin Gunve	Jordbruksverket

Lena Gustavsson	Naturhistoriska riksmuseet
Stephan Gyllenhammar	
Alexander Göransson	Marina Läroverket
Anders Göthberg	
Matilda Haeffner	Marina Läroverket
Zainab Haidar	Atleticagymnasiet
Anette Hamich	
Anne-Charlotte Hansson	Naturhistoriska riksmuseet
Per Hedberg	Stockholms universitet
Tove Hedlöf	Marina Läroverket
Hanna Heering	Marina Läroverket
Natanael Heijmer	Marina Läroverket
Eva Hellberg	Riksmusei Vänner
Andrea Hennyey	Naturhistoriska riksmuseet
Laszlo Hennyey	
Patrik Henriksson	
Joana Henze	Stockholms universitet
Staffan Hermansson	
Lars Hillström	Högskolan i Gävle
Mikael Himberg	Åbo Akademi
Daniella Hoff	Marina Läroverket
Alexander Hoffman	Stockholms universitet
Hugo Hollmark	Marina Läroverket
Kevin Holston	Naturhistoriska riksmuseet
Thorbjörn Honglo	
Ylwali Häggblad	Marina Läroverket
Emelie Högstedt	Marina Läroverket
Marcus Ibrahim	Atleticagymnasiet
Per Ingvarsson	PI (π) Fly Vatten och Fiskevård AB
Måns Irborg	Marina Läroverket
Sven Jakobsson	Stockholms universitet
Abdullahi Jama	Atleticagymnasiet
Fabian Johansson	Marina Läroverket
Mikael Johansson	
Ulf Johansson	Naturhistoriska riksmuseet
Sten Johnels	
Anton Jonsson	Marina Läroverket
Bodil Kajrup	Sveriges Fiskforskares Förening
Chaima Kalef	Atleticagymnasiet
Hanna Kaliff	Student
Hampus Karlsén	Marina Läroverket
Erik Karlsson	SLU Aqua
Ingemar Karlsson	
Oliver Karlöf	Stockholms stad
Maria Karouzou-Priede	
Carolina Kekki	Atleticagymnasiet
Helga Keyzer Forsby	Naturhistoriska riksmuseet

Yasmina Khadige
Malin Kjellin
Hampus Kjörsvik
Ebba Kristina Skare Persson
Sven Kullander
Eva Kylberg
Thomas Källman
Joakim L. Andersson
Joanna Lagberg
Ida Lagerlöf
Eva Lange
Dan Larhammar
Jasmina Lekic
Jake Leyhr
Anders Lidhammar
Amanda Lindahl
Johanna Lindton
Thomas Linley
Noomi Lodenius
Sverker Lovén
Axel Lund
Stefan Lundberg
Tyrone Lundström
Thomas Lyrholm
Vanessa Macchiavello
Ola Magntorn
Emil Maier
Alexandra Malmgren
Erica Mejlön
Aimee Miles
Abdidahir Mohamed Sabriye
Daniel Molin
Veronica Morin
Aman Mottaqui-Tabar
David Mårding
Sture Nellbring
Emil Nilsson
Peter Nilsson
Sebastian Nilsson
Ingrid Nordemar
Mats Nordenskjöld
Michael Norén
Matilda Norrby
Marie Norstedt
Elisabeth Nyberg
Lars Nyberg
Nike Nylander

Atleticagymnasiet
Sportfiskarna
Marina Läroverket
Marina Läroverket
Naturhistoriska riksmuseet
Naturhistoriska riksmuseet
Naturhistoriska riksmuseet
Marina Läroverket

Marina Läroverket

Uppsala universitet
Atleticagymnasiet

Riksmusei Vänner
Stockholms universitet
Stockholms universitet
Newcastle University
Stockholms universitet
Stockholms idrottsförvaltning
Marina Läroverket
Vaaka Naturkonsult

Naturhistoriska riksmuseet
Marina Läroverket
Högskolan Kristianstad
Haninge Akvarieförening
Marina Läroverket
Evolutionsmuseet
Uppsala universitet
Atleticagymnasiet
Trapezia AB
Marina Läroverket
Skogsstyrelsen
Aquaria Vattenmuseum AB

Marina Läroverket
Naturhistoriska riksmuseet
Stockholms universitet
Länsstyrelsen i Stockholm

Naturhistoriska riksmuseet
Marina Läroverket

Naturhistoriska riksmuseet

Trapezia AB

Lennart Nyman
Inger Näslund
Vide Ohlin
Christer Olburs
Felix Oliveberg
Oscar Olseryd
Markus Olsson
Mathias Palm
Hanna Pauser
Julia Pedersen
Simon Rodensjö
Yessenia Rojas
Carl Rolff
Anna Roos
Jannikke Räikkönen
Francisco Salazar Nunez
Olivia Selander
Charlotte Sirc
Stefan Skoglund
Jonatan Stagge
Olof Stark
Jill Staveley Öhlund
Fredrik Stephanson
Thomas Strid
Anders Svensson
Tony Söderblom
Emma-Sofie Söderlund
Stina Tano
Alice Tegborg
Fanny Tegethoff
Björn Tengelin
Clara Torpman
Robban Tranefalk
Lisa Westberg
Richard Vestin
Veronica Westman
Elias Wewel
Håkan Wickström
Elina Viinamäki
Charlie Wijnbladh
Hans Wikström
Tomas Viktor
Daniel Willsch
Alexander Wood
Rickard Yngwe
Måns Zellman
Xiaopeng Zhou

Världsnaturfonden WWF
Grodkollen

Länstyrelsen Uppsala län
Stockholms universitet

Fotograf
Uppsala Universitet
Marina Läroverket
Student
Stockholms universitet
Naturhistoriska riksmuseet
Naturhistoriska riksmuseet
Marina Läroverket

Marina Läroverket
SLU
Marina Läroverket

Naturhistoriska riksmuseet
Marina Läroverket
Huddinge kommun
Stockholms universitet

Naturskyddsföreningen
Marina Läroverket
Naturhistoriska riksmuseet
Norconsult AB
Marina Läroverket
Aquaria Vattenmuseum AB
Aquaria Vattenmuseum AB
Huddinge kommun
Marina Läroverket
Stockholms universitet
Sveriges lantbruksuniversitet
Stockholms universitet
Rädda Valleviken
Riksmusei Vänner
IVL Svenska miljöinstitutet
Marina Läroverket
Stockholms universitet
SLU Aqua
Marina Läroverket

FishBase Symposium 2018 — *Fishes At Depth!*

Programme

- 09:00 - 09:30 Registration, coffee and sandwiches
Moderator: **Inger Näslund**, WWF Sweden
- 09:30 - 09:35 Opening, **Michael Norén**, FishBase Sweden
- 09:35 - 10:20 **Imants G. Priede**, University of Aberdeen, UK: *Deep-Sea Fishes: Discovery, Distribution, Origins and Diversity*
- 10:20 – 10:50 Fruit break
- 10:50 – 11:35 **Alan Jamieson**, Newcastle University, UK: *The deepest of them all: In situ observations of the world's deepest fishes*
- 11:35 – 12:20 **Fanny de Busserolles**, University of Queensland, Australia: *Deep-sea fish visual ecology*
- 12:20 – 13:30 Lunch break
- 13:30 – 14:15 **Jan Yde Poulsen**, Greenland Institute of Natural Resources, Denmark: *Giants and dwarfs - new species, genera and families of fish from the deep-sea*
- 14:15 – 15:00 **Sarah Viana**, South African Institute for Aquatic Biodiversity, South Africa: *Diving through the glass – the role of natural history collections for inferring biodiversity knowledge and promoting conservation of tropical deep-sea elasmobranch species*
- 15:00 – 15:30 Coffee break
- 15:30 – 16:15 **Nicolas Straube**, Bavarian State Collection of Zoology, Germany: *Glow in the dark sharks – interrelationships and evolution of bioluminescent Chondrichthyes*
- 16:15 – 16:20 Symposium Close

Time: Monday, 15th October 2018, 09:00 – 16:20.

Place: Main Auditorium, Swedish Museum of Natural History, Frescativägen 40, Stockholm.

FishBase Symposium 2018 — *Fiskar på djupet!*

Program

- 09:00 - 09:30 Registrering, kaffe och smörgås
Moderator: **Inger Näslund**, WWF Sweden
- 09:30 - 09:35 Inledning, **Michael Norén**, FishBase Sverige
- 09:35 - 10:20 **Imants G. Priede**, University of Aberdeen, Storbritannien: *Deep-Sea Fishes: Discovery, Distribution, Origins and Diversity*
- 10:20 – 10:50 Fruktpaus
- 10:50 – 11:35 **Alan Jamieson**, Newcastle University, Storbritannien: *The deepest of them all: In situ observations of the world's deepest fishes*
- 11:35 – 12:20 **Fanny de Busserolles**, University of Queensland, Australien: *Deep-sea fish visual ecology*
- 12:20 – 13:30 Lunch
- 13:30 – 14:15 **Jan Yde Poulsen**, Greenland Institute of Natural Resources, Danmark: *Giants and dwarfs - new species, genera and families of fish from the deep-sea*
- 14:15 – 15:00 **Sarah Viana**, South African Institute for Aquatic Biodiversity, Sydafrika: *Diving through the glass – the role of natural history collections for inferring biodiversity knowledge and promoting conservation of tropical deep-sea elasmobranch species*
- 15:00 – 15:30 Kaffepaus
- 15:30 – 16:15 **Nicolas Straube**, Bavarian State Collection of Zoology, Tyskland: *Glow in the dark sharks – interrelationships and evolution of bioluminescent Chondrichthyes*
- 16:15 – 16:20 Avslutning

Tid: Måndag 15:e oktober 2018, 09:00 – 16:20.

Plats: Stora hörsalen, Naturhistoriska riksmuseet, Frescativägen 40, Stockholm.

