

Meeting
Stove
2012

The logo for 'Meeting Stove 2012' features the word 'Meeting' in a simple black sans-serif font. Below it, the word 'Stove' is written in a large, elegant black script font. The letters 'o', 'v', and 'e' in 'Stove' are artistically rendered with thick, brush-like strokes. The 'o' is blue and contains a small blue fish. The 'v' is red and has a red bird perched on its upper curve. The 'e' is green and has a green tree growing from its top. Below 'Stove', the year '2012' is written in a bold, black, sans-serif font.

Meeting Steve 2012

Invited Speaker:

Tracey Chapman

Dept. of Evolution, Ecology and Biodiversity

University of East Anglia, UK



Sexual conflict and competition: Molecules, mechanisms and evolutionary change

Conflict can occur at many different biological levels from genes to societies. Our research focuses on identifying the sometimes conflicting interactions between males and females and on understanding the mechanisms involved, using fruitfly model systems. Ultimately these types of interactions within and between the sexes during mating and reproduction can fuel evolutionary change and help explain some of the extraordinary diversity observed in reproductive molecules and traits.

Meeting StEvE 2012 is organised by the Department for Comparative Zoology, Institute for Evolution and Ecology, University of Tübingen.

Organisation committee:

Henri Thomasson
Katharina Foerster
Suska Weller

Technical Support:

Klaus Eisler
Dieter Georgi
Jürgen Rösinger
Adrian Tröscher

Coffee breaks and dinner:

Melanie Anzalone
Anne Cohrs
Linda Katzmann
Christina Nitzsche
Inga Roedenbeck
Tatjana Stooss
Corinna Waider
Erich Weber

And a big THANK YOU for the participant contributions to the dessert buffet!

Programme

Thursday, 06 December

From	Till	
1.00 pm	2.30	Registration open
4.00	5.00	Registration open
2.00	2.10	Introduction
2.10	2.35	Jonas Müller
2.35	3.00	Manuel Weinkauff
3.00	3.25	Jörg Henninger
3.25	4.00	Tobias Gerlach
4.00	5.00	Poster session
5.00	6.15	Hilgendorf lecture Tracey Chapman
7.00	9.00	Dinner Zoologische Schausammlung

Friday, 07 December

9.05 am	9.30	Marion Bonazzi
9.30	9.55	Manuela Aiglstorfer
9.55	10.20	Paavo Bergmann
10.20	10.45	Danelle Seymour
10.45	11.15	Break
11.15	11.40	Dominik Grimm
11.40	12.05	Natalie Iwanczuk
12.05	12.30	Sara Tomiolo
12.30	1.30 pm	Lunch
1.30	1.55	Anne Rysavy
1.55	2.20	Christoph Wißing
2.20	2.45	Diedrich Sievers
2.45	3.10	Albert Eisenbarth
3.10	3.45	Break
3.45	4.10	Hugo Reyes-Centeno
4.10	4.35	Krisztina Vincze
4.35	5.00	Jan Michel Meyer
5.00	5.25	Alissa Mittnik
5.25	5.35	Closing remarks and presentation prize

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Talk abstracts

Efficient de-novo computation of ultra-high density genetic maps from RAD marker sequencing

Jonas Müller, MPI Molecular Biology

By multiplexed analysis of restriction-site associated DNA markers (RAD-seq) using the Illumina platform, hundreds of individuals can be rapidly and inexpensively genotyped. Methods to infer genotypes without having to rely on a reference sequence and to efficiently order thousands of markers are presented. These methods are applied to compute genetic maps of *Capsella rubella* and *Arabidopsis thaliana*. Subsequently, the relationship of genetic maps and de-novo assemblies is investigated.

Effects of environmental change on the calcification of foraminifer tests

Manuel Weinkauf, Micropaleontology

To investigate the influence of environmental stress on the calcification intensity of planktonic Foraminifer, the size-normalized weight of four selected species was investigated for a time interval covering the onset of Sapropel S5 in the Eastern Mediterranean. Two shallow-dwelling species showed a continuous decrease in weight, correlated with stable oxygen isotope, which can most likely be attributed to the enhanced freshwater influx at that time, probably reflecting salinity changes.

The electric sense of the gymnotiform electric fish *Apteronotus leptorhynchus* is a successful model system in research on the neural computations underlying behavior.

Jörg Henninger, Neuroethology

These fish generate an electric discharge, which is modulated to create communication signals. For the interpretation of electrophysiological data of the electrosensory systems, detailed knowledge about the fish's natural behavior is desirable. The presented study targets this question by providing and applying a novel method for undisturbed long-term monitoring of electric fish behavior in the natural environment.

A red rag for a fluorescent fish - how fluorescent body colouration triggers male aggression in a reef fish

Tobias Gerlach, Animal Evolutionary Ecology

In marine environments, the inherent properties of seawater limit available colours to blue-green hues, so research on visual signals in fishes has been focused on such short-wavelengths. Recently discovered red fluorescence pigments have the potential to create colours rare in marine environments and have been proposed as a novel signalling mechanism. I experimentally show that red fluorescent body colouration plays an important role in the sexual selection of a marine wrasse, demonstrating important implications for marine visual ecology.

Quantitative evaluation of DNA loss in ancient bones submitted to CT exposure

Marion Bonazzi, Paleogenetics

Ancient DNA research is a recent field that allows studying sequences from ancient organisms. The influence of the X-ray exposure (CT scanning) on the quantity and the quality of the ancient DNA is not fully understood. All human fossils are scanned prior to invasive analysis (including DNA extraction). Here we report preliminary that suggest a massive degradation of DNA in samples exposed to a high dosage of radiation.

Snapshot of a 12 Million-year-old ecosystem

Manuela Aiglsdorfer, Biogeology

A unique large mammal assemblage from the Middle Miocene of Austria One of the richest and most complete European terrestrial vertebrate faunas of late Middle Miocene age (12.2 - 12.0 Ma) was found near Gratkorn at the northeastern realm of the Styrian Basin (Austria). It is one of the rare localities from the Sarmatian sensu stricto (late Serravallian) in the Central Paratethys area with a vertebrate fauna both high in quality as well as rich in quantity reflecting an autochthonous faunal assemblage.

Parthenogenesis in the oribatid mite *Archezogetes longisetosus*

Paavo Bergmann, Evolutionary Biology of Invertebrates

We examined the anatomy and development of its reproductive system by means of microscopy and synchrotron-X-ray tomographies. The analyses revealed meiotic prophase in oocytes within tritonymphs, confirming automictic parthenogenesis. No oogonies remain in the adult stage and oocytes progress towards embryogenesis in rapid progression. Early egg shell solidification and oviductal brood chambers permit enhanced parental investment and opportunistic parity behaviour while retaining a high mean production rate.

DNA methylome comparisons in three *Brassicaceae* species

Danelle Seymour, MPI Molecular Biology

Epigenetic variation, such as changes in DNA methylation, can have heritable effects on phenotype. Changes in DNA methylation are frequently unstable. Here we present the results of both methylome and transcriptome sequencing of three *Brassicaceae* species - *Arabidopsis thaliana*, *Arabidopsis lyrata*, and *Capsella rubella*. In addition to studying conservation of cytosine methylation across species, we designed an experiment to ascertain the degree of epigenetic variation between different tissues of an individual and how this variation may respond to environmental changes. Individuals from each species were subjected to both a control and a cold treatment and the aerial and root tissues were harvested independently. This cross species comparison enables us to not only investigate the evolutionary conservation of epigenetic variation and response, but to also evaluate the consequences of these changes on gene expression.

easyGWA: A central resource for efficient performance of genome-wide association studies

Dominik Grimm, MPI Molecular Biology

The rapid growth in genome-wide association studies (GWAS) in plants and animals has brought about the need for a central resource that facilitates i) performing GWAS ii) accessing data and results of other GWAS and iii) enabling all users regardless of their background to exploit the latest statistical techniques without having to manage complex software and computing resources.

Ecology and faunal assemblages of living and dead benthic foraminifera in the arctic Baffin Bay

Natalie Iwanczuk, Faculty of Geosciences

Six multicorer from the northern to the southern Baffin Bay, which were collected by the German RV MARIA S MERIAN cruise MSM09/2 in 2008, were analysed for living and dead benthic foraminifera assemblages to gain a high resolution of the present environmental conditions of this bay. This is the first study to date in this region which focuses on sediment surface samples down to 1 cm throughout the northern and southern part of Baffin Bay.

The response of plants to climate change is related to their degree of local adaptation

Sara Tomiolo, Plant Ecology

Two major ecological filters determine local adaptation in plants: abiotic stress and biotic interactions, the latter of which has been widely ignored. We conducted a reciprocal transplant experiment in the field followed by a greenhouse experiment. Our results suggest that plant-plant and plant-soil interactions play a major role for determining plant performance. Therefore, biotic interactions must be addressed when studying local adaptation in the future.

Shrub seedling dynamics under climate change

Anne Rysavy, Plant Ecology

Understanding and predicting the responses of plant communities to environmental changes and disturbances is one of the oldest challenges in ecology. As climate change continues to afflict natural ecosystems, promoting research in this field has become inevitable. Here we examined mechanisms influencing and regulating the seedling dynamics of a common Mediterranean dwarf shrub as yet our knowledge about mechanisms causing shifts in community composition and shrub encroachment are very limited.

Terrestrial ecosystems around the last Neandertals and first modern Humans in North-Western Europe

Christoph Wißing, Biogeology

During the replacement of Neandertals by modern humans 40000 years ago a diverse community of large mammals lived in Belgium. I'll reconstruct the trophic webs and climatic conditions around this time using stable isotopes as tracers.

Systematic deviation from bilateral symmetry in modern and fossil clypeasteroid sea urchins

Dietrich Sievers, Invertebrate Paleontology

This project is about small scale deviations from perfect symmetry in flat irregular clypeasteroid sea urchins commonly known as sand dollars. These deviations are known as Fluctuating Asymmetry and are believed to represent a species state of adaption to a specific environment. Modern landmark-based Geometric Morphometric methods are used on populations of recent sand dollars from the Gulf of Mexico and fossil ones from the Florida Pliocene Tamiami Formation.

A new genotype of the filarial nematode *Onchocerca ochengi* from Zebu cattle and its relationship to *O. volvulus*, the causing agent river blindness

Albert Eisenbarth, Comparative Zoology

A newly classified genotype of the African bovine filarial species *Onchocerca ochengi* is described and its phylogeny discussed based on comparison of mitochondrial DNA. It is sympatric with already known genotypes of *O. ochengi* and *O. volvulus* and may have sibling species status. Possible evolutionary scenarios on the parasite-vector-host level with its implications are debated.

Cranial signatures of admixture & population history in southeast asia

Hugo Reyes-Centeno, Senckenberg Center for Human Evolution and Paleoenvironment

The study of modern human origins anthropogeny is currently divided between the parsimonious Out-of-Africa replacement model and an "assimilation" hypothesis positing fertile admixture between multiple Pleistocene hominins. Using a suite of geometric morphometrics methods this study explores the phenetic affinities between modern human populations in Southeast Asia and shared-derived patterns in their cranial shape. Different biogeographical scenarios of modern human dispersals from Africa into Asia are also tested providing context to the inconsistencies in the current human origins debate.

Biomarker studies using fish and invertebrates as tools for health assessment of the Neckar river in the Tübingen area

Krisztina Vincze, Animal Physiological Ecology

The current project is an ecotoxicological field survey using biomarker methods in the aquatic environment. The aim is to get an overview of the water quality of the river Neckar near Tübingen by analyzing the overall health status of feral fish and invertebrate species by means of passive and active monitoring experiments.

A developmental toss-up? Dauer regulation via small molecules in *Pristionchus pacificus*

Jan Michel Meyer, MPI Developmental Biology

Pristionchus pacificus is a cosmopolitan hermaphroditic nematode characterised by a very high level of genetic diversity. In *P. pacificus* a diverse set of small molecules has been found to mediate mating dauer formation and mouth-form dimorphism. In my PhD project a population genomic approach is combined with analytical chemistry to study the small molecules involved in dauer formation using strains collected from La Réunion Island that have co-evolved with an endemic host-beetle.

Direct calibration of the human mitochondrial molecular clock using ancient human genomes

Alissa Mittnik, Paleogenetics

The rate in which mutations accumulate in the human genome has long been used to date major evolutionary events in our history. However, different methods to calibrate this 'molecular clock' yielded widely different results. In a direct approach using ten complete human mitochondrial genome sequences spanning 40 000 years of human history as calibration points we estimated a date of 157 kya for the modern human mitochondrial divergence.



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student or PhD
candidate?**

Raise this hand when you want
to ask a question during the dis-
cussion at the end of a talk.
The chair will give you priority!