

INFORMATION & PROGRAM



INTERNATIONAL UNION FOR THE STUDY OF SOCIAL INSECTS
IUSSI2010
XVI CONGRESS IN COPENHAGEN DENMARK



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Program and Information

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Welcoming remarks

Welcome to Denmark and the city of Copenhagen on behalf of the Northwest European Section of the International Union for the Study of Social Insects (IUSSI). It is a great pleasure to host more than 750 delegates from more than 40 countries. We highly appreciate that you have all found ways to come despite the global financial crisis, which has not made it easy to obtain funding for congress visits. I hope you will enjoy Copenhagen for its informal Scandinavian atmosphere and its distinct Northern European cultural heritage, as well as for the scientific content of the Congress.

A bit of history

It was 37 years ago that our Section last hosted the 7th IUSSI Congress in London. The section was founded in 1955 as the “British section”, a name that has now been superseded by “Northwest European Section”. This internationalization is aptly illustrated by the current venue being in one of the Nordic countries, where most of the non-British members of our Section reside.

The International Union for the Study of Social Insects had its second foundation meeting in Copenhagen in 1953, before its official establishment in 1954. In these early days Denmark had its own small IUSSI section, and was represented in both the first International Committee and the first Editorial Board of the Union’s journal *Insectes Sociaux*, which appeared for the first time in 1954.

While IUSSI members initially identified themselves mostly by the kind of social insects in which they were interested, later developments emphasized specializations such as ecology, evolution, behaviour, biodiversity, communication, genetics, molecular biology and neuroscience, or conceptual paradigms such as inclusive fitness theory, self-organization or disease resistance. In recent years, the rapid advances in molecular biology, computing and social evolution theory have revolutionized the study of social insects as can be seen when comparing the programs of the last five IUSSI Congresses.

IUSSI today

Societies of ants, bees, wasps, termites and other arthropods often allow researchers to address questions of general biological significance. This is because the IUSSI’s profile has gradually broadened to encompass “the Study of Social Interactions”, in which the classic social insects continue to be prime targets for study but no longer exclusive ones.

IUSSI Congresses have also increasingly become major dissemination and outreach events. Delegates still reaffirm each other in the excitement of studying social insects, but they do so from an increasingly broad and interdisciplinary perspective. They now reach out to a much larger scientific community and the general public to show why their fundamental and applied science is interesting and relevant.

The 16th IUSSI Congress in Copenhagen

When we started the organization of this Congress we supplemented our own section Organizing Committee with an international Program Committee, to represent sections and study systems roughly in proportion to global IUSSI membership. We selected plenary

speakers after polling both the program- and organizing committees for nominations, and we asked both committees for specific comments on submitted symposium proposals before deciding on their final selection. Finally, we created two open sessions to accommodate talks and posters on topics not covered in any of the symposia. Symposium organizers then decided which submitted abstracts were to be presented as contributed talks and which as posters.

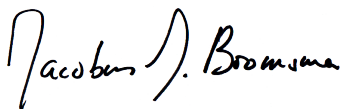
Apart from the opening session, our venue will be the Faculty of Health Sciences of the University of Copenhagen. The University was founded in 1479 and has had – a notable historical feat for biologists - a functional Zoological Museum since 1630. At present, the University of Copenhagen is the largest Institution of higher education in Denmark, with ca 37000 students and more than 7000 staff. The Congress banquet and farewell party will be held in the Odd Fellow Palace, a building close to the Royal Residence that dates back to the middle of the 18th century.

Scientifically, our social insect fields of inquiry experience exciting times as we are strongly represented in many of our key disciplines worldwide. It is extremely pleasing to see so much of that research strength being gathered here, and in particular that about 50% of delegates are graduate students and postdocs. More than ever before, this Congress also hosts guest speakers that do not (primarily) work on “our type of bugs”, but represent adjacent fields or model systems that continue to inspire our community.

This will undoubtedly be a memorable Congress, as we will discuss and hopefully adopt a new IUSSI constitution to formalize various natural developments that have changed the business of the Union over the years. We will also reassess the publishing contract for *Insectes Sociiaux*, which we reckon will result in a healthier financial situation for the Union. The draft constitution text will be on display in the venue and is available on the Congress website. All regular and student members of IUSSI are encouraged to attend both the meeting of their Section on Monday, where these developments will be discussed, and the General Assembly meeting on Thursday, where the International Committee of IUSSI will make the final propositions that the membership will be asked to endorse.

During the Congress the Union will recognize Professor Charles Michener with the Hamilton Award for career long excellence in research and mentoring. We will also have “The Living Past of Insect Sociobiology” as a plenary symposium at the start of the Congress and hope that younger delegates in particular will attend to get a feel for how current research fields gained their prominence. Finally, we will have a plenary lecture to commemorate one of the Union’s major figureheads, former IUSSI President, present Congress Program Committee member, and winner of the first (2006) Hamilton Award, Professor Ross Crozier, who unexpectedly passed away last November.

I hope you will have a pleasant and stimulating week in Copenhagen!

A handwritten signature in black ink that reads "Jacobus J. Boomsma". The signature is written in a cursive, flowing style.

On behalf of the Northwest European Section and the IUSSI2010 Organizing Committee,
Jacobus J. (Koo) Boomsma, IUSSI President, Copenhagen, July 2010

Acknowledgements

Sponsors

The organizers of IUSSI 2010 would like to thank the following for their financial support to the Congress:

The Danish National Research Foundation



The Carlsberg Foundation



The Danish Biotech Research Academy



Scandinavian Airlines



Scandinavian Airlines

Exhibitors and Promotion Materials

The following publishers and institutions support the Congress by having a stand or having promotion materials in the delegates' bags:

Exhibitors

Beijing Genomics Institute – Shenzhen (BGI)
Oxford University Press
Springer
Wiley-Blackwell

Promotion Materials

BRILL
Cambridge University Press
Oxford University Press
Princeton University Press
The Royal Society – *also sponsoring the prizes of the poster competitions*

The International Secretariat of the IUSSI

Koos Boomsma	University of Copenhagen	<i>President</i>
Joan Herbers	The Ohio State University	<i>Secretary General</i>
Johan Billen	University of Leuven	<i>Editor of Insectes Sociaux</i>
David Nash	University of Copenhagen	<i>Webmaster</i>
Christopher Starr	University of the West Indies	<i>Archivist</i>

Organizing committee

Patrizia d’Ettorre	University of Copenhagen	<i>Congress secretary</i>
Jes S�e Pedersen	University of Copenhagen	<i>Congress treasurer</i>
David Nash	University of Copenhagen	<i>Congress web master</i>
Bettina Markussen	University of Copenhagen	<i>Logistic support</i>
Susanne den Boer	University of Copenhagen	<i>Logistic support</i>
Henrik H. de Fine Licht	University of Copenhagen	<i>Logistic support</i>
Mark Brown	Royal Holloway, London	<i>Poster session</i>
Mogens Gissel Nielsen	University of Aarhus	<i>Post-congress excursion</i>
Seirian Sumner	Institute of Zoology, London	<i>Hardship fund</i>
Trine Bilde	University of Aarhus	
Rob Hammond	University of Hull	
Perttu Sepp�	University of Helsinki	
Lotta Sundstr�m	University of Helsinki	

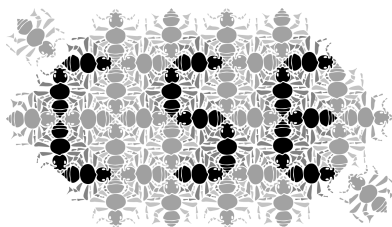
Program committee

Koos Boomsma (Chair)	University of Copenhagen, Denmark
Serge Aron	Free University of Brussels, Belgium
Anne-Genevi�ve Bagn�res	CNRS, University of Tours, France
Bernie Crespi	Simon Fraser University, Canada
Ross Crozier	James Cook University, Australia
Nigel Franks	University of Bristol, UK
Klaus Hartfelder	University of S�o Paulo, Brazil
J�rgen Heinze	University of Regensburg, Germany
Abraham Hefetz	Tel Aviv University, Israel
Judith Korb	University of Osnabr�ck, Germany
Cristina Lorenzi	University of Turin, Italy
Francis Ratnieks	University of Sussex, UK
Gene Robinson	University of Illinois, Urbana-Champaign, USA
Joan Strassmann	Rice University, USA
Kazuki Tsuji	University of the Ryukyus, Japan
William Wcislo	Smithsonian Tropical Research Institute, Panama
Diane Wiernasz	University of Houston, USA
Theresa Wossler	University of Stellenbosch, South Africa
Michal Wojciechowski	Jagiellonian University, Poland

The local team

The organizers of IUSSI 2010 are truly indebted to our local team of social insect workers:

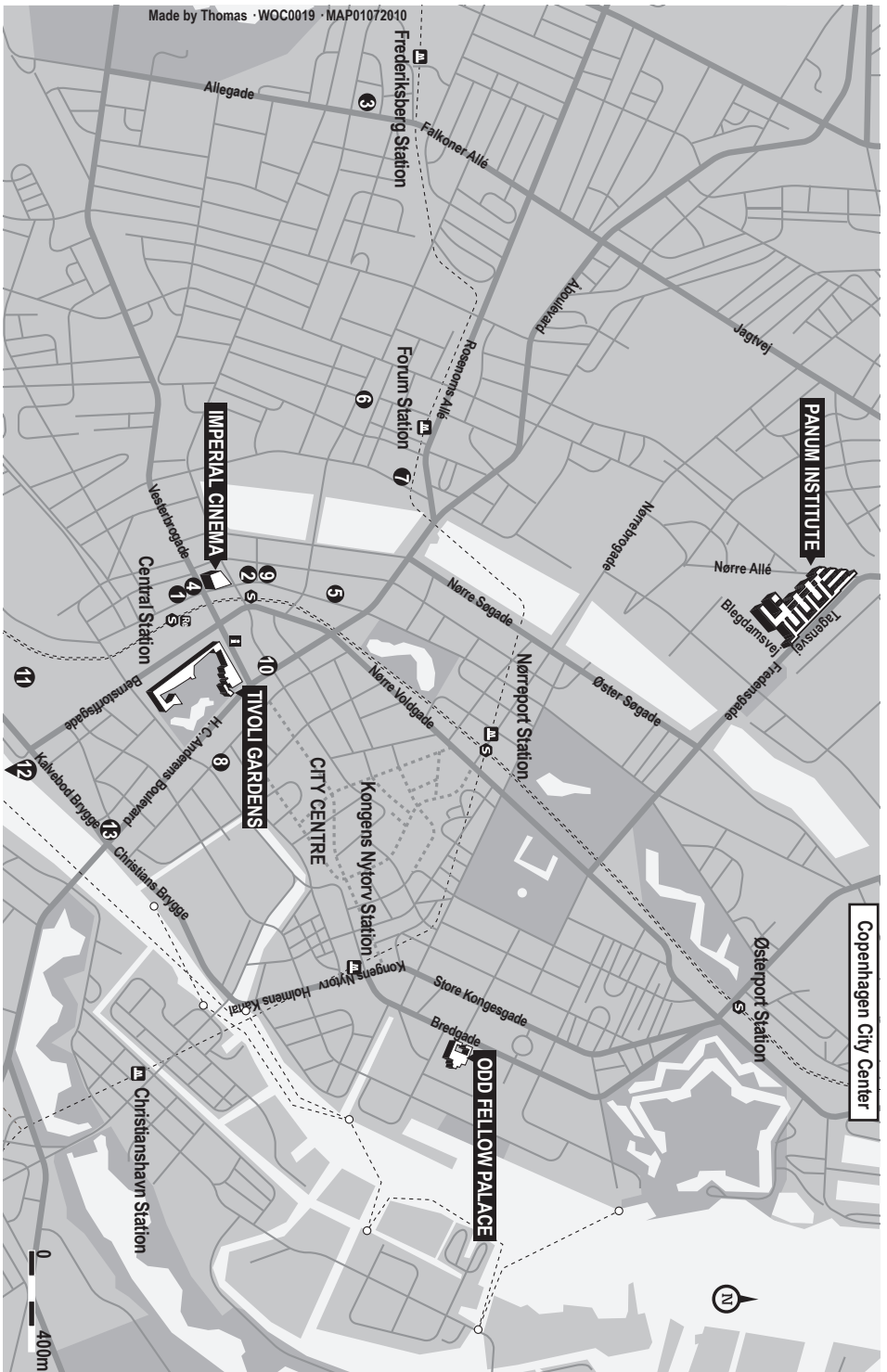
Rachelle Adams (parents & kids room)
Sandra Breum Andersen (delegates' materials and merchandise)
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Marlene Stürup (poster sessions)
Nate Sanders (poster sessions)
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Line Vej Ugelvig
Svjetlana Vojvodic
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Danish National Research Foundation
Centre for Social Evolution

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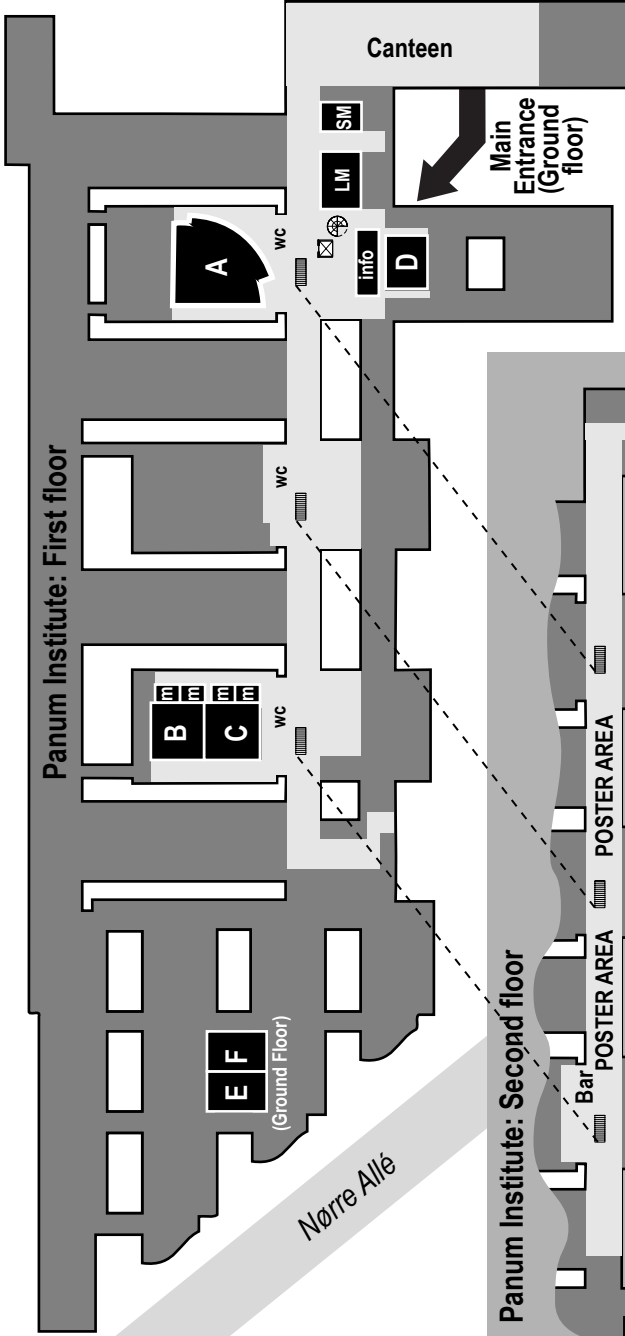
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- HOTELS**
- 1 Grand Hotel
 - 2 Hotel Imperial
 - 3 Radisson Blu Falconer Hotel
 - 4 Scandic Webers
 - 5 Best Western Richmond
 - 6 Cabinn Express
 - 7 CABINN Scandinavia
 - 8 Hotel Danmark
 - 9 Nordania Mercur
 - 10 The Square
 - 11 Wakeup Copenhagen
 - 12 CABINN Metro
 - 13 Danstol Copenhagen City
- TRANSPORT**
- I Registered Tourist Office
 - Pedestrian Street
 - S S-train
 - R Regional Train
- VENUE**
- M Metro
 - B Harbour Bus

Tagensvej

ATM
Bank



- A-F Auditoria
- Info Information & Registration
- LM Large Meeting Room
- SM Small Meeting Room, Talk Upload & Computer Room
- m Mini-meeting rooms (10 seat)
- Child Parents' & Children's Room
- wc Toilets (downstairs)
- Stairs between 1st and 2nd floors

General information about the Congress

The Congress venue

The Panum Institute, Blegdamsvej 3, DK-2200 Copenhagen N., houses the Faculty of Health Sciences of the University of Copenhagen. It is located close to central Copenhagen on the border between the Nørrebro and Østerbro districts, and is within walking distance (15-20 min) of Nørreport Station, from where there are also bus links (bus no. 6A, 42, 43, 150S, 184 and 185).

Registration and information desk

The registration and information desk/secretariat is located centrally at the Panum Institute outside auditorium D (see map page 11). It can be reached by phone during opening hours at: (+45) 29355542. In addition to the people manning the registration desk, local IUSSI Congress organizers (easily recognizable by their dark grey 'crew' t-shirts) will hopefully also be able to answer any questions you might have.

Opening hours:

Sunday, August 8:	14:00 – 21:00
Monday, August 9:	11:00 – 18:00
Tuesday, August 10:	08:00 – 19:30
Wednesday, August 11:	08:00 – 13:00
Thursday, August 12:	08:00 – 19:30
Friday, August 13:	08:00 – 17:00

Congress bags & name badges

Your Congress bag includes Congress materials (Abstract book and this Program book), a 10-use card for public transport in central Copenhagen, a Tivoli garden entrance ticket, two drink tickets for the welcome reception Sunday, and one drink ticket for each of the light dinners on Tuesday and Thursday (additional drinks can be purchased at all social events). Those that signed up for the banquet Friday will also have a special ticket for this. When registering, you will receive a name badge that is also your admission ticket to the scientific sessions, coffee/tea breaks, lunches and the light dinners during the poster sessions. The name badge should be worn at all times at the Congress venue. Along with your name badge you will also receive a personalized access code for the Wi-Fi network at the Panum institute.

Auditoria

The President's welcome and the keynote address on Monday morning will take place in the **Imperial Cinema** (see page 10). All other plenary lectures and parallel sessions will take place in one of the four main auditoria at **the Panum Institute**, which are named from A to D and are located on the first floor (see map page 11). All plenary lectures will take place in Auditorium A, with audiovisual feeds to Auditoria B and C.

Exhibitions

Publishers and sponsors will have exhibition stands that are open throughout the Congress and located on the first floor of the Panum Institute.

Internet access & computer room

Free wireless internet is available at the Panum Institute for every delegate. You will receive a personal wireless internet password when you register. A limited number of stationary computers with internet access are available in the computer room located in the small meeting room on the first floor of the Panum Institute (see map page 11). Talk-upload will also take place on dedicated computers in this room (see page 18).

Opening hours for the computer room:

Sunday, August 8:	14:00 – 21:00
Monday, August 9:	11:00 – 18:00
Tuesday, August 10:	08.00 – 18.00
Wednesday, August 11:	08.00 – 12:00
Thursday, August 12:	08.00 – 18.00
Friday, August 13:	08.00 – 16.00

Parent & kids room

We have set-up a family room for participants and their accompanying children at the Congress venue. This is located in room 1.2.18 on the second floor of the Panum Institute (see map page 11). For more information about the parent & kids room, contact Rachelle Adams (RAdams@bio.kudk) or the registration desk.

Opening hours for the parents & kids room:

Sunday, August 8:	14:00 – 22:00
Monday, August 9:	11:00 – 19:00
Tuesday, August 10:	08.30 – 22:00
Wednesday, August 11:	08.30 – 12:00
Thursday, August 12:	08.30 – 22.00
Friday, August 13:	08.30 – 18.45

First aid kit

A first aid kit is available at the registration desk.

Money

There is a bank with an ATM machine located right outside the Congress venue (Danske Bank, Fredensgade 27, see map page 11).

Food & drinks

Welcome reception

The welcome reception, including a buffet meal, will take place in the canteen area of the Panum Institute from 19.00 – 22.00 on Sunday August 8. You will receive tickets for two complementary drinks when registering, and additional beverages will be available for purchase.

Bar

Drinks and snacks can be bought at the bar on the second floor (in the poster area) and at vending machines located throughout the venue. The bar on the second floor is open daily from 09:00 until the end of the day's program.

Coffee breaks

Coffee and tea plus light refreshments will be served during breaks from several stands in the first floor corridor of the Panum Institute.

Lunch packs

Lunch will be served from several stands in the first floor corridor of the Panum Institute. Each stand will also provide lunch for vegetarians. Participants who have indicated during registration that they have special dietary needs that are not covered by the ordinary lunch pack (other than being vegetarian) will be able to collect their lunch in individually named bags from a stand marked for this purpose.

There are plenty of places to sit and enjoy your lunch (both inside and out), but we ask you to please make sure you tidy up after yourselves.

Dinner at the Congress venue (Tuesday and Thursday)

A light buffet dinner will be served at the Panum Institute on Tuesday and Thursday evenings during the poster sessions. A ticket for each session can be found in your Congress bag, which can be exchanged for a complementary drink at the bar in the poster area at the second floor, where additional beverages are also available for purchase. There are many small tables scattered throughout the poster area, so delegates are encouraged to use these for eating.

Congress banquet & farewell party

The Congress banquet will take place from 19:30 on Friday August 13 at the *Odd Fellow Palace* (Bredgade 28) in central Copenhagen. The *Odd Fellow Palace* is located a short 5 minute walk from the Metro Station at **Kongens Nytorv** or a 15 minute walk from **Nørreport Station** (see map page 10). After dinner, the party will continue until 01:00.

Excursions on Wednesday August 11

There will be an extra opportunity to sign-up and pay for the excursions on Sunday 8 August only, at the information desk, from 14:00-21:00. Payments can be made in cash or by credit card. Further details of the different excursions can be found on the conference website (<http://www.iussi.org/iussi2010/>) and are also available at the information desk. **All tours will depart from the Panum Institute (buses will depart from Blegdamsvej).**

City & Harbour Tour, 13:00 – 16:00

The tour ends at **Gammel Strand** in Central Copenhagen (canal boat portion approx. 50 min).

Copenhagen Walking Tour, 13:45 – 16:45

The tour ends at **Kongens Nytorv** in Central Copenhagen. The tour will be entirely on foot, and there are no inside visits. We recommend wearing flat comfortable footwear and appropriate outdoor clothing. Approximate walking distance: 5 km.

Copenhagen Gardens Tour (Including Botanical Gardens), 13:15 - 16:45

The tour ends at **Tivoli Gardens**. The tour will be entirely on foot, so wear flat comfortable footwear and appropriate outdoor clothing for the weather of the day.

Copenhagen Bird-Spotting Tour, 13:30 - 16:30

The tour ends at **Tivoli Gardens**. Comfortable and appropriate footwear and clothing are recommended because the tour operates in all weather conditions. The tour destination is based on the best chances for good bird sightings, but sightings are not guaranteed.

Ancient Roskilde & Viking Ship Museum, 12:45 – 16:45

The tour ends at **Tivoli Gardens**. The excursion fee includes bus transport to and from Roskilde, and entrance to Roskilde Cathedral and the Viking Ship Museum.

Castles of North Zealand, 12:30 to 18:00

The tour ends at **Tivoli Gardens**. The excursion fee includes bus transport and entrance fees to Frederiksborg and Kronborg Castles. Note that flash photography is not permitted inside Frederiksborg Castle.

N.B: Please note that Copenhagen's famous *Little Mermaid* statue is on loan to the 2010 EXPO in Shanghai from April to November, and will not be seen on the Copenhagen tours. A copy of the *Little Mermaid* is on display in Tivoli Gardens.

Tivoli Gardens

Every participant and accompanying person will receive an entrance ticket to Tivoli Gardens as part of the conference package. This can be used at any time, but we have set aside the evening of **Wednesday, August 11** as a time for visiting Tivoli as a social event, and many of the organized tours for Wednesday afternoon will have Tivoli Gardens as their end point. There are a multitude of restaurants in Tivoli gardens where delegates can sample Danish or international cuisine at very reasonable prices.

Tivoli Gardens is a well-known amusement park and pleasure garden in Copenhagen, located in the city centre at Vesterbrogade 3, easily reachable from the main train station or the S-train station *Vesterport*, or from the bus terminal at the town hall square. The park opened on August 15, 1843 and is one of the oldest amusement parks that has survived intact to the present day. From the beginning Tivoli included a variety of attractions: buildings in the exotic style of an imaginary Orient, a theatre, band stands, restaurants and cafés, flower gardens and mechanical amusement rides such as a carousel and a primitive rollercoaster. Most of these attractions have been continued until present day, and usually improved upon, and Tivoli today is a very special mix of old and new entertainment. After dark, coloured lamps illuminate the gardens, and there is a light show every day at 23:30.

Accompanying persons

We look forward to seeing accompanying persons at the welcome reception on Sunday the 8th of August. During registration, accompanying persons will receive two drink tickets for the reception, as well as an entrance ticket to Tivoli gardens and a ticket for the conference banquet on Friday the 13th of August.

The city of Copenhagen and its surroundings have a large number of museums, castles, parks and shops, which can be targeted for shorter or longer trips (see also the Congress excursions). Some pamphlets and information are included with the registration materials, and more is available at the information desk during the Congress. In addition, the tourist office down town (Vesterbrogade 4A) will be happy to provide further details of possible activities, and there are also many good suggestions on their web site (<http://www.visitcopenhagen.com/>).

General information about Copenhagen and Denmark

Public transport

Copenhagen is well equipped in terms of public transportation, which is usually quick and efficient, and runs at virtually every hour of the day. The free multi-ride ticket included in your conference bag is valid for 10 trips, and can be used for all types of transportation (except taxi) within the downtown Copenhagen area (2 zones). If you plan to travel outside the city centre (including to the airport!), you will need to purchase additional tickets. These are available from the bus driver or from vending machines at the S-train or Metro stations. When starting your journey, you must punch the card in a yellow card-clipping machine when entering a bus, or at the station before entering an S-train or Metro. Tickets for 2 zones are valid for 1 hour after being stamped, and during this period any number of changes of bus and train can be made (show your stamped ticket to the driver of the next bus, or to a ticket inspector if asked). For more information on the public transport system in Copenhagen, please see the following web site: <http://www.moviatrafik.dk/dinrejse/Tourist/>

Metro

Two recently-built metro lines connect many areas in Copenhagen, but the closest Metro stop to the Congress venue at the Panum Institute is **Nørreport Station**. The Metro is the most efficient route between the centre of Copenhagen and Copenhagen Airport. The Metro runs every 4 minutes during the day and every 15-20 minutes during the night (after 0:00).

Train

Short distance trains (S-trains) connect Copenhagen and the surrounding suburbs. Longer distance trains stop at Copenhagen Central Station ('København H') and some routes also stop at Østerport and Nørreport Stations. Copenhagen airport is also reachable by train from København H, Nørreport or Østerport stations, although these run less frequently than the Metro.

Bus

Many bus lines run throughout Copenhagen, and the busiest routes (the "A" busses) run every 4-6 min during the middle of the day. In the evening the frequency of services drops to every 10, 20 or 30 minutes, and the last busses usually run around 00:30, after which less frequent night busses (usually one bus per hour) serve most bus lines throughout the night. **Look out for cyclists when getting on and off buses, as the cycle lanes run between the pavement and the bus!**

Taxi

Taxis in Copenhagen are relatively expensive. They can be hailed on the street, picked up at taxi ranks at the major train stations, or ordered by telephone on (+45) 35 35 35 35.

Walking and Cycling

The centre of Copenhagen is quite compact, so most places can be reached on foot, if one is not in a hurry. Cycling in Copenhagen is also an excellent way to get around, with cycle paths along the vast majority of streets. There is a free bicycle-loan scheme in central Copenhagen, but please note that the Panum Institute is outside the area covered by this scheme. Bicycles can be rented at a number of places in town, including 'Østerport Cykler' (Oslo plads 9) and the relatively cheap 'Baisikeli' bike rental (Turesensgade 10).

Banks and currency exchange

There are many 24-hour ATM / Cash-point machines throughout Copenhagen and at the airport, mostly associated with banks, and most of them will accept foreign credit cards (particularly VISA), although fees will usually apply. Banks are normally open Monday to Friday, 9:00 – 15:00 (sometimes 16:00). The official currency in Denmark is the Danish Krone (DKK for short, although you may also see it written DKr), which is further subdivided into 100 Øre. Unlike many European countries, Denmark does not use the Euro, following a narrow defeat for the proposition to adopt the Euro as currency in a referendum in 2000. However, the exchange rate between the Danish Krone and the Euro is fixed at ca. DKK 7.45 per Euro, and many shops in Copenhagen will accept Euros (but you are likely to receive unfavourable exchange rates, so make sure you bring Danish Krone rather than Euros if you are bringing currency from outside Europe).

Emergency

The official emergency service telephone number is 112, which can be used without charge on mobile- and pay-phones. For less urgent occasions, the police can be contacted by dialling 114. The closest emergency room is at 'Bispebjerg Hospital', about 3 km from the Panum Institute.

Liability and Insurance

Neither the organizers nor the Panum Institute take any responsibility for injury or damage involving persons or property during the Congress and all tours and events. Participants are expected to be adequately insured.

Shops

In general, shop opening hours are from 10:00-18:00 Monday to Friday and 09:30 to 15:00 on Saturdays. Supermarkets are generally open 08:00-20:00, and there are a few that are open until 22:00 or midnight.

Tipping

Service charges are included in the restaurant bill so tipping is generally not expected, although appreciated.

Information about presentations

Oral presentations

President's welcome and keynote address

The presidential welcome and the keynote address on Monday August 9 will be held at the **Imperial Cinema**, Ved Vesterport 4. (see map of Copenhagen page 10). The Imperial cinema is located adjacent to **Vesterport** S-train Station, which can be reached by bus lines 5A, 6A, 12, 14, 15, 29, 30, 40, 47, 66, 67 and 68 as well. It is also within walking distance of many of the Congress hotels.

Plenary lectures

The plenary lectures will be held in Auditorium A at **the Panum Institute** (which can seat 400 people), and can also be followed in auditoria B and C (185 seats each) via an audiovisual link. Questions to the speakers can be asked only by people in auditorium A, and participants are strongly advised to reach auditorium A well ahead of the start time of each plenary.

Parallel symposia

There will be four sessions running in parallel in the four auditoria named A-D at the Panum Institute (see map on page 11). It is a few minutes' walk from auditoria A and D to auditoria B and C (see map on page 11), which is why there is a three minute break between each talk to allow people enough time to move between auditoria.

General information for speakers

Plenary speakers will receive a signal from the chair after 40 minutes, and will be expected to finish after 45 minutes, after which there will be 5 minutes for questions. **Invited symposium speakers** are scheduled to have 27 minutes for their talk and 5 minutes for questions. **Other symposium speakers** have 15 minutes for their talk and 2 minutes for questions.

Please prepare your presentation in Microsoft PowerPoint, and check that it runs correctly on a PC with Microsoft PowerPoint 2003/2007 under Windows XP. Macintosh or UNIX computers will not be available at the Congress, and speakers who have prepared their presentations on a Macintosh or UNIX machine should check their presentations on the PCs available in the Computer room.

Please bring your talk on a USB stick or CD-ROM to the Computer room, where talks will be uploaded by one of the members of our local team (recognizable by his/her dark grey 'crew' t-shirt). **Speakers should upload their talks the day before their presentation is scheduled!** (see the opening times of the computer room on page 13). We will not be able to guarantee a successful transfer of your talk to the computers in the auditoria if you do not upload your talk in time. Speakers presenting on Monday August 9 should upload their presentation on the evening of Sunday August 8, or between 11:00 and 12:00 on Monday.

Speakers should not use their own laptops to give their talk, nor use any other presentation program than Microsoft PowerPoint.

General information for the symposium organizers

Symposium organizers will chair the session in their symposium, and it is essential that the schedule is followed to the minute, as there are normally four sessions running at the same time which need to be kept synchronized. We recommend that symposium organizers indicate to the speaker when there are 2-3 minutes of speaking time left (i.e. 2-3 minutes before questions are scheduled) by making a sign and one minute left by standing up. When time is up, please cut the speaker off politely. At the end of the designated question time, all discussion should cease immediately, to allow movement between auditoria. Delegates should only move between auditoria during the three-minute slots set aside for this purpose, to avoid disturbing question times. If a talk is cancelled, chairs should stick to the timetable and wait for the next scheduled talk.

Poster presentations

If you have a poster presentation, you are scheduled either in the first or second session (see below). Please make sure you mount your poster on the correct poster board, i.e. the one whose number corresponds to the abstract volume number. Authors are expected to be present at their poster during the poster session to provide further explanation and answer questions. The organizers take no responsibility for posters left at the end of the Congress.

Poster session 1

Posters for the first poster session on Tuesday August 10 at 18:40-20:30 should be put up by Tuesday 12:00 at the latest. Posters should be taken down before Wednesday August 11 at 12:00. Posters for symposia 1, 7, 8, 10, 12, 13, 14, 20, 21, 23, 25, 27, 30 and 31 are scheduled for the first poster session.

Poster session 2

Posters for the second poster session on Thursday August 12 at 18:40-20:30 should be put up between 12:00 on Wednesday August 10 and 12:00 on Thursday August 12. Posters should be taken down by Friday August 13 at 18:00 at the latest. Posters for symposia 2, 3, 4, 5, 6, 9, 11, 15, 16, 17, 18, 19, 22, 24, 26 and 28 are scheduled for the second poster presentation.

How to find a poster

In the display area, posters are grouped by symposium number and abstract number (see abstract book). If you want to find a poster by author: locate the author's name in the author index of the abstract book and read the poster identification number (symposium – poster number)

The Royal Society poster prize

The Royal Society have kindly agreed to sponsor a prize for the best student poster in each of the two poster sessions. Student posters will be judged by a committee led by Mark Brown and Nate Sanders, based on the quality of their presentation and scientific content, with an emphasis on the former. Student posters should be clearly labelled as such by a sticker, which can be obtained from the organizers when the posters are put up. The prize-winners will be announced during the closing remarks, just before the afternoon plenary lecture on Friday. The prize will consist of a 1-year subscription to *Proceedings B* or *Biology Letters*.

Hamilton Award 2010

Charles D. Michener



The IUSSI honors a senior scientist at its quadrennial Congress with the Hamilton Award. The highest honor we bestow, the Hamilton Award recognizes lifetime achievement in the biology of social insects. We seek nominations of individuals whose scientific contributions are profound, and who have broadly influenced colleagues and students. A committee of IUSSI Section Presidents has chosen Charles D. Michener to receive the Hamilton Award 2010.

Professor Michener, who prefers to be called “Mich”, is *the* world authority on bees. He published his first paper in 1935 as a teenager, and in the ensuing 75 years his publications have included more than 400 papers, and highly influential books on bee social behavior and systematics. While his work has maintained a special focus on halictid bees, he has also made contributions to the biology of arthropods from moths to mites.

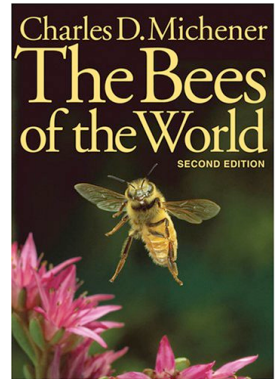
Mich has trained a legion of bee biologists during his long career at the University of Kansas; the list of his students and collaborators shows his strong influence on the development of social insect biology. He has inspired by example, and given his



With Martin Lindauer, 1976

time generously to help his students do their best.

Few scientists have had the influence on our field as has Charles Michener, and we are honored to bestow this recognition on him.



Unfortunately Mich is unable to attend the Congress to collect the award in person, but there will be a plenary session to celebrate the award and his many achievements on Wednesday morning at 9:20, in Auditorium A, with video links to Auditorium B and C.

Remembering Ross Crozier (1943-2009)

The first recipient of the Hamilton Award, Ross Crozier, sadly passed away last November. A plenary lecture celebrating his life and achievements will be given by Pekka Pamilo on Wednesday from 10:20 to 10:50 in Auditorium A, with video links to Auditorium B and C.



IN MEMORIAM ROSS CROZIER

Pekka Pamilo

Department of Biosciences, University of Helsinki

The former president of IUSSI and the first recipient of the Hamilton Award, professor Ross Crozier passed away on the 12th of November 2009. Ross could be characterized as continuously travelling between theoretical and empirical research, building a bridge between the two fields. He was also quick to introduce new genetic and molecular techniques in social insect research. Ross was one of the first who realized the importance of Hamilton's theory and he properly defined the coefficients of genetic relatedness in male-haploid insects and developed methods to estimate relatedness from empirical data. He also introduced models of kin recognition, thus pioneering an important research area. He argued strongly that kin selection is an adequate and sufficient explanation for the evolution of advanced sociality, without a competitor. His interest in phylogenetics led him further to general studies on molecular evolution, and he was instrumental in taking social insect research into the molecular era. Together with his wife and long-term collaborator Ching Crozier, he sequenced the complete mitochondrial genome of the honeybee, thus paving the road to the current genome-wide projects. He contributed significantly through his own research and also by training many students, hosting visitors, and advising and inspiring colleagues. Many colleagues will miss his thoughtful comments and advice.

Please see the IUSSI web site www.iussi.org for links to obituaries of Ross.

Round table sessions

In addition to the program of talks and posters attached to symposia, we have reserved the evening of Tuesday 10 August (20:30-22:00) for round-table discussion sessions on specific themes. These are open to all delegates who would like to attend

The diverse approaches to the study of insect sociality: their relevance, complementarity and conceptual interrelationships

Organizer: Raghavendra Gadagkar

Place: Auditorium A

As in many other areas of the study of animal behavior, a sharper polarization between the evolutionary (ultimate) and physiological (proximate) approaches appears to be developing in the study of insect sociality. Two additional approaches have also gained prominence in recent decades. These are concerned with understanding the ontogeny of social behavior, including tracing the pathway from genes to behavior, and with reconstructing the phylogenetic history of the appearance of different forms of cooperative and altruistic behavior. It turns out that these four approaches correspond almost exactly to Niko Tinbergen's famous four questions that he outlined as being equally valid and complementary in the study of animal behaviour. Some of us who participated in a symposium with this theme during the recent IEC in Rennes felt that we should continue this discussion at the IUSSI-2010 in Copenhagen using a different format – short 5-6 minute statements by several opinionated participants (8-10?) followed by ample opportunity for debate and dialogue. We therefore hope that this round table will attract proponents of diverse viewpoints concerning the relevance and conceptual interrelationships between different approaches used today for studying insect sociality.

The systems approach to the organisation of social insect colonies

Organizer: Ana Sendova-Franks

Place: Auditorium B

The systems approach has been accepted as a new way of studying biological organisation. It combines in a virtuous circle theory, computer modelling and biological experiments. Until recently this approach has been highlighted mainly in the context of cells, tissues and organisms. Increasingly, however, social insects are being recognised as a prime model system for understanding links between the individual and collective levels. This is because social insects represent ecologically successful systems honed by natural selection that lend themselves to experimental manipulation revealing behaviour at multiple levels of organisation. For these reasons social insect biology is now attracting scientists from areas as diverse as physics, engineering, physiology, neurobiology, psychology, transport, environment, health and social behaviour. This workshop aims to bring together the latest achievements in our understanding of colony-level processes such as building, nest choice, foraging, resource distribution or the spread of disease. We will put the systems approach to the test. What new insights can it deliver? Can it integrate several colony-level processes? We will utilise the time of the workshop on Tuesday night for eight oral presentation slots of 15 min duration (including questions) to facilitate informal discussions during the remaining three days of the Congress.

Ant Genomics

Organizers: Tim Linksvayer, Jürgen Gadau, Chris R. Smith

Place: Auditorium C

With the advent of 4-6 complete ant genomes in 2010, countless new opportunities will arise for our understanding of the origin and evolution of ants, the genetic architecture of social traits, regulation of division of labor, etc. Three goals critical to the success of an ant genome community are that these emerging data are freely available, easily accessible and centrally curated. We will discuss the current state of the art and different approaches to achieve these three goals. We will also discuss how to expand the current databases (e.g. more ant genomes), develop new tools (e.g. transformation, microarrays) and whether a separate yearly ant or social insect genome meeting would be a good idea (and who will organize the first one if we decide to do one).

Pollinator decline and honeybee colony losses

Organizer: Jay Evans

Place: Auditorium D

This open round table discussion aims to shed more light on the causes of honeybee colony losses and pollinator decline. Since a New York Times headline and papers in leading journals, the issue of honeybee colony losses and pollinator decline has received considerable interest not only in the IUSSI community but also in the general public. Indeed, beekeeping is a declining industry and on top of that apiculturists in the northern hemisphere are being regularly confronted with severe colony losses, showing a wide range of symptoms, including CCD (= Colony Collapse Disorder). For the last years, such losses of *Apis mellifera* colonies appear to occur at a much higher magnitude and frequency, but the underlying factors and mechanisms are poorly understood. Pests and pathogens (e.g. bacteria, fungi and viruses), environmental aspects (e.g. malnutrition, poisoning, sublethal effects of pesticides) and bee vitality/diversity constitute major suspects. Due to the ubiquitous ectoparasitic mite *Varroa destructor*, interactions between factors are inevitable and most likely contribute to the massive recent losses. Moreover, the decline seems not to be restricted to *Apis mellifera* but also for other pollinators suggesting that some mechanisms are similar. Therefore cutting edge research on pollinator decline and colony losses is timely and many respective large-scale proposals have been granted (BEE DOC, COLOSS, STEP, VIVA).

Challenges of honeybee transgenic technology

Organizers: Gro V. Amdam and Gene E. Robinson

Place: Large Meeting Room

This round-table meeting on honeybee transgenic technology aims to develop a workgroup initiative that can establish functional tools for social insect transgenesis. As a community, our studies of honeybee brain and behavior, physiology and pathology, development and communication have reached new levels of sophistication over the last 15 years. Over the same 15 years, many labs have wanted to meet the growing expectation that transgenic techniques be used and developed further to test gene function, e.g. by conditional over-expressing or deletion mutants. Transgenesis has been attempted by

homologous recombination and aided element- or bacteriophage site-specific transposition. Tools such as sperm-mediated transfection, electroporation, and introduction by injection or cell culture have been explored in combination with systems such as *Baculovirus* vector and Piggyback or mariner elements. Associated resources such as mutagens, chimeric technology and methods for storage of germplasm have also been tested. Yet, we have not achieved workable approaches to transgenesis so far or founded strategies to maintain/preserve transgenic stocks as a community-wide resource. The availability of several hymenopteran genomes makes this challenge even more relevant. The round-table meeting is an invitation to discuss whether and how we can unite resources and divide labor: to increase our joint likelihood of success, and to reduce the costs and risks on each lab that participates in a workgroup initiative. The meeting will begin with a presentation by Dr. Antónia Monteiro on transgenesis in butterflies (www.lepdata.org/monteiro/index.html), and a synopsis by Dr. Navdeep Mutti on the efforts to achieve honey bee and social insect transgenesis to date.

IUSSI Section meetings

The IUSSI section meetings will take place on Monday August 9 at 12:05 – 13:15-14:05 in the designated meeting rooms (see below). The meetings are open to all IUSSI members (or those who may be interested in joining), so grab your lunch bag, find the right meeting room, and come support your local section and meet fellow social insect researchers from your part of the world!

North American	Auditorium A
Central European	Auditorium B
North-West European	Auditorium C
Brazilian & Bolivarian (joint)	Auditorium D
Japanese	Auditorium E*
French	Auditorium F*
Australian	Large meeting room
Italian	Small meeting room

This year the sections will, as well as their usual business, be discussing the new IUSSI constitution, so please attend to make your views known.

**The routes to Auditoria E & F, which are on the ground floor, will be clearly signposted.*

IUSSI International committee meeting

The IUSSI international committee meeting will take place on Monday August 9 at 19:30 – 22:30 in the large meeting room, and is only open to members of the committee or their designates. Refreshments will be provided.

IUSSI general assembly meeting

The IUSSI general assembly meeting is open to all members, and will take place on Thursday August 12 at 20:30 – 22:00 in auditorium A. We hope that the new constitution will be adopted at this meeting and, as usual, another of the important points to be decided upon is the location for the next international IUSSI meeting in 2014!

List of Symposia

1. From colonies to communities: the consequences of behaviour for communities
2. Invasion biology of social insects
3. Going big: large scale spatial and temporal patterns in social insect communities
4. Ecological and evolutionary implications of inter-specific, multipartite interactions
5. Major transitions in termite feeding biology and their consequences
6. The role of relatedness in social evolution: a critical assessment of when it matters, and when not
7. Sex and the insect society: focus on unorthodox breeding systems
8. Brood parasitism and inquilinism in social insects
9. Insect-microbe symbioses as evolutionary innovation
10. The social evolution of fusion and exclusion
11. Kin structure variation, gene flow and social adaptation
12. Integrating molecular and morphological approaches to elucidate social insects phylogenies
13. Patterns and processes of aging and lifespan: how special are social insects?
14. Evolution of morphological novelty in social insects
15. Genetics of social behaviour
16. The genetic basis and consequences of social evolution
17. The beneficial use of ants and termites in agriculture and nutrition
18. Optimization in natural systems: designing nature-inspired algorithms using social insects
19. Behavioral syndromes in social insects: the evolution of behavioral variation between individuals and colonies
20. Insect societies as complex systems
21. Communication and the integration of multiple information sources in colony organization
22. Semiochemicals in insect societies: the effects of genes and environment and their interaction
23. Nestmate and other kin-recognition systems: from ecology and behaviour to molecular and neurophysiological techniques
24. New insights into social evolution: Molecular and genomics approaches to comparative neuroethology
25. My brain made me do it: Neurological basis of behavioral repertoire changes in social insects
26. Trajectories towards sociality across arthropod taxa
27. Immunity and sociogenomics of host-parasite interactions
28. Parasites in social insects
29. The living past of Insect Sociobiology
30. Open symposium - Social insect behavior
31. Open symposium - Current topics in social insect biology

Detailed program Sunday 8 August

- 14:00** Registration open at the Panum Institute
- 19:00-22:00** Welcome reception at the Panum Institute

Detailed program Monday 9 August

08:30-09:00	Arrival at the Imperial Cinema for the Congress opening session (only the first day; on all other days we will convene at the Panum Institute)	<i>Imperial</i>
09:00	Welcome by the IUSSI president, Koos Boomsma	<i>Imperial</i>
09:30	Keynote address by Gene Robinson, University of Illinois at Urbana-Champaign, USA <i>Juvenile hormone and division of labor research: A new relationship for a new era</i>	<i>Imperial</i>
10:30-11:30	Transfer from the Imperial cinema to the Panum Institute (shuttle busses are available)	
11:30-13:10 and	Lunch	<i>Panum</i>
12:00-13:10	IUSSI section meetings	<i>See p. 26</i>
13:10	Announcements & Introduction to the plenary lecture	<i>Aud A</i>
13:15-14:05	Plenary lecture by Andrew Bourke, University of East Anglia, UK <i>Bumble bees as model systems in behaviour and ecology</i>	<i>Aud A</i>
14:10	Parallel Symposia	
	1. From colonies to communities: the consequences of behaviour for communities.	<i>Aud A</i>
	23. Nestmate and other kin-recognition systems: from ecology and behaviour to molecular and neurophysiological techniques	<i>Aud B</i>
	27. Immunity and sociogenomics of host-parasite interactions	<i>Aud C</i>
	14. Evolution of morphological novelty in social insects	<i>Aud D</i>
15:15	Coffee Break	
15:45	Parallel Symposia 1, 23, 27, 14 (<i>continued</i>)	
17:00	Coffee Break	
17:30-19:00	Symposium 29: The living past of Insect Sociobiology	<i>Aud A</i>
19:30-22:30	IUSSI International Committee Meeting	<i>Large meeting room</i>

Monday 9 August, afternoon: Symposium 1
Auditorium A

From colonies to communities: the consequences of behaviour for communities

Organizers: Nathan Sanders, University of Tennessee, USA
Xim Cerda, Doñana Biological Station, Spain
Deborah Gordon, Stanford University, USA

- 14:10** Donald H. Feener Jr. (invited)
Competition in ant communities: Not enough theory?
- 14:45** Philip J. Lester (invited)
Venom toxicity, aggression and coexistence patterns between *Monomorium* and Argentine ants.
- 15:15** *Coffee break*
- 15:45** Louise van Oudenhove
The evolutionary dynamics of social foraging in ants: the influence of competition and resource distribution.
- 16:05** Catherine Parr
Exploring the discovery-dominance trade-off and the role of habitat complexity
- 16:25** Jessica M.C. Pearce-Duvet
Fast food in ant communities: How competing species find resources
- 16:45** Elizabeth G. Pringle
Effects of a geographic mosaic of ant aggressiveness on herbivore communities

Monday 9 August, afternoon: Symposium 23
Auditorium B

Nestmate and other kin-recognition systems: from ecology and behaviour to molecular and neurophysiological techniques

Organizers: Margaret Couvillon, University of Sussex, UK
Jelle van Zweden, University of Sussex, UK

- 14:10** Francis L. W. Ratnieks (invited)
Adaptive shifts in the acceptance thresholds of honey bee guards
- 14:45** Mamiko Ozaki (invited)
A comparative physiological study on nestmate recognition system between mono- and polygyne ant species
- 15:15** *Coffee break*
- 15:45** Andreas S. Brandstaetter
Friends and foes from an ant brain's point of view - functional imaging of colony odors in *Camponotus floridanus*
- 16:05** Ronara S. Ferreira
Nestmate recognition and tolerance thresholds in the facultative polygynous ant *Pachycondyla verenae*
- 16:25** Philip Newey
Not one odour but two: a new model for nestmate recognition
- 16:45** Michael Sheehan
Adaptive cognitive specializations for conspecific face processing in *Polistes* paperwasps

Monday 9 August, afternoon: Symposium 27
Auditorium C

Immunity and sociogenomics of host-parasite interactions

Organizers: Sylvia Cremer, University of Regensburg, Germany
Michael Lattorff, Martin-Luther-Universität Halle-Wittenberg, Germany
Ben Sadd, ETH Zürich, Switzerland

- 14:10** Paul Schmid-Hempel (invited)
Strategies of immune defences in social insect societies
- 14:45** Dan Hultmark (invited)
Evolution and specificity in insect immunity
- 15:15** *Coffee break*
- 15:45** Michael Simone-Finstrom
Resin collection as colony-level immune defense in honey bees
- 16:05** Mayako Kutsukake
Molecular basis of self-sacrificing gall repair by soldier aphids in the social aphid,
Nipponaphis monzeni
- 16:25** Helge Schlüns
Evolution of immunity-related genes in myrmeciine ants
- 16:45** Qi Gao
Social immunity and the expression of immune-relevant genes in the Eastern
subterranean termite

Monday 9 August, afternoon: Symposium 14
Auditorium D

Evolution of morphological novelty in social insects

Organizers: Diana Wheeler, University of Arizona, USA
Christian Peeters, University Pierre and Marie Curie, Paris 6, France

- 14:10** Armin Moczek (invited, delivered by Diana Wheeler)
On the origins of novelty in development and evolution
- 14:45** Mathieu Molet (invited)
Developmental mosaics, social buffering, and the evolution of novel castes in ants
- 15:15** *Coffee break*
- 15:45** Roberto A. Keller
Flapping wings and strong heads: novel thorax architectures in queen and worker ants
- 16:05** Marcel Kruchelski Tschá
Size and shape in the evolution of ant worker morphology
- 16:25** Anna Dornhaus
Worker size polymorphism in bumble bees (*Bombus impatiens*): evolution and mechanism
- 16:45** Raphaël Boulay
The evolution of ergatoid queens in the ant genus *Cataglyphis*: the role of natural selection and caste fate conflicts

Monday 9 August, late afternoon: Symposium 29

Auditorium A

The living past of insect sociobiology

Organizers: John Wenzel, Ohio State University, USA
Chris Starr, University of the West Indies, Trinidad & Tobago

- 17:30** Nigel R. Franks (invited)
A Brief History of Distributed Decision-Making in Social Insects
- 17:50** Michael Breed (invited)
Lasioglossum, Charles Michener, and social behavior in bees
- 18:10** Robert Jeanne (invited)
The growth in understanding of the biology of the swarm-founding wasps
- 18:30** Pierre Jaisson (invited)
Perception of Insect Sociobiology in the Country of Lamarck
- 18:50** Raghavendra Gadagkar (invited)
From bacteriophage molecular biology to wasp sociobiology - driving against the traffic on a one-way street

Detailed program Tuesday 10 August

08:00	Registration open	<i>Panum</i>
08:55	Announcements & Introduction to the plenary lecture	<i>Aud A</i>
09:00	Plenary lecture by Hanna Kokko, University of Helsinki, Finland and Australian National University, Australia <i>How shortsighted is mother nature, and does it matter?</i>	<i>Aud A</i>
09:50	<i>Coffee break</i>	
10:20	Parallel Symposia	
	20. Insect societies as complex systems	<i>Aud A</i>
	7. Sex and the insect society: focus on unorthodox breeding systems	<i>Aud B</i>
	21. Communication and the integration of multiple information sources in colony organization	<i>Aud C</i>
	12. Integrating molecular and morphological approaches to elucidate social insects phylogenies	<i>Aud D</i>
12:05-13:10	<i>Lunch</i>	
13:10	Announcements & Introduction to the plenary lecture	<i>Aud A</i>
13:15-14:05	Plenary lecture by Christina Grozinger, Pennsylvania State University, USA <i>Genomics of pheromone communication in honey bees</i>	<i>Aud A</i>
14:10	Parallel Symposia 20,7,21,12 (<i>continued</i>)	
15:45	<i>Coffee break</i>	
16:15	Parallel Symposia	
	10. The social evolution of fusion and exclusion	<i>Aud A</i>
	8. Brood parasitism andinquilism in social insects	<i>Aud B</i>
	13. Patterns and processes of aging and lifespan: how special are social insects?	<i>Aud C</i>
	25. My brain made me do it: Neurological basis of behavioral repertoire changes in social insects	<i>Aud D</i>
18:40-20:30	Poster session 1: Symposia 1,7,8,10,12,13,14,20,21,23,25,27,30,31. <i>A light meal will be served during this session</i>	<i>2nd floor</i>
20:30-22:00	Round table sessions	<i>See p.23</i>

**Tuesday 10 August, morning & early afternoon: Symposium 20
Auditorium A**

Insect societies as complex systems

Organizer: Ana Sendova-Franks, University of the West of England, UK

- 10:20** Kim Christensen (invited)
Ant colonies as complex systems
- 10:55** Claire Detrain (invited)
Complex foraging patterns in ants: the key role of workers' density and social context
- 11:30** Benjamin Blonder
Interaction networks control information flow and energetics in ants
- 11:50** Richard James
Emergency networking: famine relief in ant colonies
- 12:05** *Lunch* **13:10** *Plenary lecture (Aud A)*
- 14:10** Patrick M. Hogan
The statistical physics of decision-making in insect colonies
- 14:30** Raphael Jeanson
Spatial distribution and social networks in the ant *Odontomachus hastatus*
- 14:50** Danielle Mersch
Time in an ant network
- 15:10** Nicholas J. Minter
Complex structure formation: four-dimensional ant nest architecture
- 15:30** Tom Richardson
Group dynamics and record signals in the ant *Temnothorax albipennis*

Tuesday 10 August, morning & early afternoon: Symposium 7
Auditorium B

Sex and the insect society: focus on unorthodox breeding systems

Organizers: Tamara Hartke, University of Veterinary Medicine, Hannover, Germany
Kenji Matsuura, Okayama University, Japan

- 10:20** Shigeto Dobata (invited)
Clone wars: persistence of the single lineage of cheaters in the parthenogenetic ant *Pristomyrmex punctatus*
- 10:55** Trine Bilde (invited)
Implications of inbreeding for social evolution: insights from cooperative spiders
- 11:30** Monica Gruber
Crazy ant sex: Genetic caste determination, clonality, and inbreeding in a population of invasive yellow crazy ants
- 11:50** Andrea Luchetti
Eusociality and SINEs in the subterranean termite *Reticulitermes lucifugus* (Isoptera, Rhinotermitidae)
- 12:05** *Lunch* **13:10** *Plenary lecture (Aud A)*
- 14:10** Amanda S. Izzo
Spotting the top male: sexually-selected quality signals in a paper wasp, *Polistes dominulus*
- 14:30** Elina Lastro Niño
Dissecting the factors affecting honey bee queen (*Apis mellifera* L.) post mating changes and queen-worker interactions
- 14:50** Boris Baer
Sex, sperm and proteins: The study of evolutionary dynamics on the molecular scale
- 15:10** Vera Lucia Imperatriz-Fonseca
First discovery of a rare polygyne colony in the stingless bee *Melipona quadrifasciata* (Apidae, Meliponini)
- 15:30** Christian Peeters
Multiple evolution of gamergates (sexually reproducing workers) in the ant subfamily Ponerinae

Tuesday 10 August, morning & early afternoon: Symposium 21 Auditorium C

Communication and the integration of multiple information sources in colony organization

Organizers: Christoph Grüter, University of Sussex, UK
Elva Robinson, University of York, UK
Francis Ratnieks, University of Sussex, UK

- 10:20** James C. Nieh (invited)
Triggered by peril: a negative feedback signal curbs collective action in a superorganism
- 10:55** Thomas D. Seeley (invited)
Individual smarts and group smarts: both workers and colonies are skilled integrators of information
- 11:30** Tomer J. Czaczkes
Keep on truckin' - A novel role for ant trail pheromones as a 'keep on walking' signal in the ant *Lasius niger*
- 11:50** Walter M. Farina
Social learning and waggle dance behavior used as tools to guide honey bees to a specific crop
- 12:05** *Lunch* **13:10** *Plenary lecture (Aud A)*
- 14:10** Chihiro Himuro
The function of egg volatile pheromones in termites: Mechanisms of egg orientation and recognition.
- 14:30** Elva J. H. Robinson
Organisation of work in a changing environment - what determines who switches task?
- 14:50** Thomas Schlegel
Communication in decision-making: similarities between vertebrate brains and social insect colonies?
- 15:10** Nathalie Stroeymeyt
Prior experience and nest site selection in house-hunting ants: an interplay between private and public information
- 15:30** Benjamin J. Taylor
Yellowjackets use nest-based cues to preferentially exploit higher-quality resources

Tuesday 10 August, morning & early afternoon: Symposium 12
Auditorium D

Integrating molecular and morphological approaches to elucidate social insect phylogenies

Organizers: Caspar Schöning, Länderinstitut für Bienenkunde, Hohen Neuendorf , Germany
Lars Vilhelmsen, University of Copenhagen, Denmark

- 10:20** Seán Brady (invited)
The importance of morphology in the age of molecular social insect phylogenetics
- 10:55** Michael J. Sharkey (invited, delivered by Lars Vilhelmsen)
Morphology and molecules, the first comprehensive, total evidence, phylogenetic analysis of the Hymenoptera
- 11:30** Paul Eggleton
Molecules, guts and symbionts reveal the origins and evolutionary diversification of termites
- 11:50** Tânia Nobre
Colonization of Madagascar by fungus-growing termites raises adaptive radiation hypothesis
- 12:05** *Lunch* **13:10** *Plenary lecture (Aud A)*
- 14:10** Philip S. Ward
New findings in ant phylogenetics: implications for morphological evolution
- 14:30** Scott Powell
On the diversification of caste: Insights from a new phylogeny for the ant genus *Cephalotes*
- 14:50** Rachele M.M. Adams
Phylogeny of the tribe Solenopsidini and cryptic social parasitic species, an eclectic approach to species delineation
- 15:10** Bonnie B Blaimer
Systematics and evolution of the Malagasy *Crematogaster* (*Decacrema*), with reference to biogeography and nesting behavior
- 15:30** Barbara Hausberger
Uncovering termite species richness

Tuesday 10 August, late afternoon: Symposium 10
Auditorium A

The social evolution of fusion and exclusion

Organizers: Duur Aanen, Laboratory of Genetics, Wageningen, The Netherlands
David Queller, Rice University, USA

- 16:15** Rick Grosberg
Colony fusion and the evolution of allorecognition specificity in marine invertebrates
- 16:50** Joan E. Strassmann
Fusion, segregation, and genes for kin recognition in a social amoeba
- 17:25** Katharina Hoffmann
Fatal meetings in the wood? Intraspecific colony encounters in wood-dwelling termites
- 17:45** Jay M. Biernaskie
When are 'greenbeard' recognition systems intragenomic outlaws?
- 18:05** Eric Bastiaans
Experimental evidence for Crozier's paradox
- 18:25** Patrick Abbot
Imperialism and the rise and fall of aphid empires

**Tuesday 10 August, late afternoon: Symposium 8
Auditorium B**

Brood parasitism and inquilinism in social insects

Organizers: Ben Oldroyd, University of Sydney, Australia
Nadine Chapman, University College London, UK

- 16:15** Tom Wenseleers (invited)
Socially parasitic reproductive strategies in stingless bees
- 16:50** Rebecca Kilner (invited)
Social parasites versus brood parasites: what they do and do not have in common
- 17:25** Donald G. Miller
Brood parasitism of neighbors by inquilines in *Tamalia* galling aphids
- 17:45** Benjamin P Oldroyd
A population genetic survey of a clonal reproductive parasite of *Apis mellifera scutellata* in South Africa
- 18:05** Boris Yagound
Experimentally induced social parasite workers are not subjected to queen control in the bumblebee *Bombus terrestris*
- 18:25** Kirsten Kreuter
How specialist and generalist cuckoo bumblebees sneak into power of reproduction

Tuesday 10 August, late afternoon: Symposium 13
Auditorium C

Patterns and processes of aging and lifespan: how special are social insects?

Organizers: Olav Rueppell, University of North Carolina at Greensboro, USA
Joel Parker, University of Southampton, UK

- 16:15** Gro V. Amdam (invited)
Social and uniquely aged? Mechanisms of honey bee aging plasticity
- 16:50** Rochelle Buffenstein (invited)
Successful aging and sustained good health in the eusocial mammal, the naked mole-rat
- 17:25** Blaine J. Cole
Senescence in a natural population of the western harvester ant, *Pogonomyrmex occidentalis*
- 17:45** Edward Almond
Kin-Selected Conflict and the Evolution of Lifespan and Ageing in *Bombus terrestris*
- 18:05** Kalevi Trontti
Antioxidant production and life span in ants
- 18:25** Ysabel Milton Giraldo
Subcaste and age-related patterns of behavioral development and neurodegeneration in the ant *Pheidole dentata*

Tuesday 10 August, late afternoon: Symposium 25
Auditorium D

My brain made me do it: Neurological basis of behavioral repertoire changes in social insects

Organizer: Marc Seid, Smithsonian Tropical Research Institute, Panama

- 16:15** Alison R Mercer (invited)
My mother made me do it: honey bee queens regulate the behaviour of workers to secure their own survival
- 16:50** Yukako Okumura (invited)
Mechanisms of age-dependent division of labor in the social aphid *Tuberaphis styraci*
- 17:25** Jean-Christophe Sandoz
Optical imaging of odour-evoked activity in the lateral horn of the honeybee *Apis mellifera*
- 17:45** Mario L. Muscedere
Intra- and interspecific neuroanatomical variation among behaviorally differentiated workers in the ant genus *Pheidole*
- 18:05** Ewa Joanna Godzinska
Biogenic amines and aggressive behaviour of the red wood ant (*Formica polyctena*)
- 18:25** Andre J Riveros
Foraging task specialization and sensory allometry in wild, hybridized and artificially selected honeybees

Detailed program

Wednesday 11 August

08:00	Registration open	<i>Panum</i>
09:15	Announcements	<i>Aud A</i>
09:20	Hamilton Award Ceremony	<i>Aud A</i>
09:50-10:20	<i>Coffee break</i>	
10:20	Remembering Ross Crozier, by Pekka Pamilo	<i>Aud A</i>
10:55-12:10	Parallel Symposia	
	31. Open symposium – Current topics in social insect biology	<i>Aud A</i>
	7. Sex and the insect society: focus on unorthodox breeding systems (continued)	<i>Aud B</i>
	21. Communication and the integration of multiple information sources in colony organization (continued)	<i>Aud C</i>
	30. Open symposium - Social insect behavior	<i>Aud D</i>
12:30-13:00	<i>Excursions leave from Panum Institute</i>	
19:00	<i>Free evening – Tivoli Gardens Amusement Park</i>	

Wednesday 11 August, morning: Symposium 31
Auditorium A

Open symposium 2 – Current topics in social insect biology

Chair: Rachele Adams, University of Copenhagen, Denmark

- 10:55** Brittany Enzmann
Gyne investment and implications for colony founding in *Pogonomyrmex* harvester ants
- 11:15** Diane C. Wiernasz
Evolution of an alternate life history in harvester ants
- 11:35** James F. Gillooly
Energetic basis of colonial living in social insects
- 11:55** Michael Kaspari
Toward a link between geochemistry and the geography of social insect populations

Wednesday 11 August, morning: Symposium 7 (continued)
Auditorium B

Sex and the insect society: focus on unorthodox breeding systems

Organizers: Tamara Hartke, University of Veterinary Medicine, Hannover, Germany
Kenji Matsuura, Okayama University, Japan

- 10:55** Kazuki Tsuji
Asexual reproduction and its evolutionary consequences in social insects
- 11:15** Morgan Pearcy
Sib-mating without inbreeding in the crazy ant
- 11:35** Edward L. Vargo
Long live the queen: royal succession through asexual reproduction in termites
- 11:55** Serge Aron
Extraordinary reproductive strategies in the ant *Cataglyphis*

Wednesday 11 August, morning: Symposium 21 (continued)
Auditorium C

Communication and the integration of multiple information sources in colony organization

Organizers: Christoph Grüter, University of Sussex, UK
Elva Robinson, University of York, UK
Francis Ratnieks, University of Sussex, UK

- 10:55** Jacob G. Holland
The role of the social environment in proximate causation of the switch point in the bumble bee *Bombus terrestris*
- 11:15** Alban Maisonnasse
Complexity of pheromone regulation in honey bees: why so many? The case of worker reproduction
- 11:35** Marianne Peso
What makes worker honey bees work?
- 11:55** Aniruddha Mitra
Dufour's gland in *Ropalidia marginata*: can caste and colony signals be expressed through the same set of chemicals?

Wednesday 11 August, morning: Symposium 30
Auditorium D

Open symposium 1 - Social insect behavior

Chair: Luke Holman, University of Copenhagen, Denmark

- 10:55** Jessica Barker
The effect of inter-group competition on intra-group cooperation in *Polistes dominulus*
- 11:15** Aimee S. Dunlap
When to acquire new information? How persistence and reward affect sampling, tracking and constancy in bumblebees
- 11:35** Thibaud Monnin
Resource allocation during colony fission in the ant *Cataglyphis cursor*
- 11:55** Adrian A. Smith
Reclaiming the crown: queen to worker punishment in the ant *Aphaenogaster cockerelli*

Detailed program Thursday 12 August

08:00	Registration open	<i>Panum</i>
08:55	Announcements & Introduction to the plenary lecture	<i>Aud A</i>
09:00	Plenary lecture by Deborah Gordon, Stanford University, USA <i>Interaction networks, foraging ecology, and the evolution of collective behavior in harvester ants</i>	<i>Aud A</i>
09:50	<i>Coffee break</i>	
10:20	Parallel Symposia	
	6. The role of relatedness in social evolution: a critical assessment of when it matters, and when not	<i>Aud A</i>
	15. Genetics of social behaviour	<i>Aud B</i>
	22. Semiochemicals in insect societies: the effects of genes and environment and their interaction	<i>Aud C</i>
	2. Invasion biology of social insects	<i>Aud D</i>
12:05-13:10	<i>Lunch</i>	
13:10	Announcements & Introduction to the plenary lecture	<i>Aud A</i>
13:15-14:05	Plenary lecture by Kevin Foster, Harvard University, USA <i>Social evolution in microbes</i>	<i>Aud A</i>
14:10	Parallel Symposia 6, 15, 22, 2 (<i>continued</i>)	
15:45	<i>Coffee break</i>	
16:15	Parallel Symposia	
	18. Optimization in natural systems: designing nature-inspired algorithms using social insects	<i>Aud A</i>
	9. Insect-microbe symbioses as evolutionary innovation	<i>Aud B</i>
	26. Trajectories towards sociality across arthropod taxa	<i>Aud C</i>
	17. The beneficial use of ants and termites in agriculture and nutrition	<i>Aud D</i>
18:40-20:30	Poster session 2: Symposia 2,3,4,5,6,9,11,15,16,17,18,19,22,24,26,28 A light meal will be served during this session	<i>2nd floor</i>
20:30-22:00	IUSSI General Assembly meeting	<i>Aud A</i>

**Thursday 12 August, morning & early afternoon: Symposium 6
Auditorium A**

**The role of relatedness in social evolution: a critical assessment of when it matters,
and when not**

Organizer: Juergen Liebig, Arizona State University, USA

- 10:20** Jürgen Heinze (invited)
Dominance, policing, and manipulation: does variation in relatedness matter?
- 10:55** Michael Taborsky (invited)
Reciprocity: an evolutionary mechanism promoting advanced sociality?
- 11:30** Juliana Rangel
No intracolony nepotism during colony fissioning in honey bees
- 11:50** Ellouise Leadbeater
Unrelated helpers in a primitively eusocial wasp: is helping tailored towards direct fitness?
- 12:05** *Lunch* **13:10** *Plenary lecture (Aud A)*
- 14:10** Thibault Lengronne
Understanding nest drifting behaviour in paper wasps using a social network approach
- 14:30** Reut Berger-Tal
Are there benefits to foraging with kin in an inbred social spider?
- 14:50** Hiroyuki Shimoji
Colony-size dependence of worker policing in the monogynous and monandrous ant *Diacamma* sp. from Japan
- 15:10** Wim Bonckaert
No facultative worker policing in a Danish population of the Vespine wasp *Dolichovespula saxonica*
- 15:30** Clint Penick
Larval castration in the ant *Harpegnathos saltator*: aggression as a case for caste conflict or a red herring?

**Thursday 12 August, morning & early afternoon: Symposium 15
Auditorium B**

Genetics of social behaviour

Organizers: Martin Beye, Heinrich Heine University, Germany
Charles Whitfield, University of Illinois, Urbana-Champaign, USA

- 10:20** Olav Rueppell (invited)
The genetic architecture of the pollen hoarding syndrome in honey bees
- 10:55** Stephen F. Goodwin (invited)
Control of sexual differentiation and behavior by the double sex gene in
Drosophila melanogaster
- 11:30** Juergen Gadau
From genes to societies - how genomes can help us to understand the genetic
architecture of sociality
- 11:50** Julie A Mustard
Getting down to the nitty gritty: Using RNAi to examine the role of single genes in
behavior
- 12:05** *Lunch* **13:10** *Plenary lecture (Aud A)*
- 14:10** Amy L. Toth
Transcriptomic and chemical signatures of dominance status in *Polistes metricus*
wasps
- 14:30** Amro Zayed
A systems study of worker behaviour in the honey bee
- 14:50** Tanja Gempe
Behaviour and gene expression are affected by the genotypic composition of
social groups
- 15:10** Peter R. Oxley
Duplicate whole genome scans of the honey bee reveal two quantitative trait loci
associated with worker sterility
- 15:30** Ryszard Maleszka
From genes to genomes to epigenomes: how do different phenotypes and
behaviours in bees arise from the same genotype?

Thursday 12 August, morning & early afternoon: Symposium 22
Auditorium C

Semiochemicals in insect societies: the effects of genes and environment and their interaction

Organizers: Steve Martin, University of Sheffield, UK
Falko Drijfhout, Keele University, UK

- 10:20** Alain Lenoir (invited)
The plasticity of the chemical signature in ants and their guest: from parasitism to myrmecophily
- 10:55** Gary J. Blomquist (invited)
Biogenesis of insect hydrocarbons used in chemical communication
- 11:30** Navdeep S. Mutti
Biased expression of fatty acid elongase genes and fertility signaling in an ant
- 11:50** Stefan Jarau
Caste determination in *Melipona* stingless bees is based on genetic predisposition and geraniol from larval provision
- 12:05** *Lunch* **13:10** *Plenary lecture (Aud A)*
- 14:10** Volker Nehring
Kin-informative recognition cues in leaf-cutting ants
- 14:30** Thomas Schmitt
Evolution of cuticular hydrocarbon profiles - from solitary to social Hymenoptera
- 14:50** Sue Shemilt
Source and maintenance of cuticular hydrocarbons in the ant *Formica exsecta*
- 15:10** Antonella Soro
Kin discriminators in the sweat bee *Lasioglossum malachurum*: the reliability of cuticular and Dufour's gland odours
- 15:30** Serafino Teseo
Inter- and intra-colonial differences in non-polar compounds in the clonal ant *Cerapachys biroi*

**Thursday 12 August, morning & early afternoon: Symposium 2
Auditorium D**

Invasion biology of social insects

Organisers: Anne-Geneviève Bagnères, C.N.R.S / I.R.B.I., France
Ed Vargo, North Carolina State University, USA

- 10:20** DeWayne Shoemaker (invited)
Global invasion history of the fire ant *Solenopsis invicta*
- 10:55** Marc Kenis (invited)
Ecological impact of invasive alien insects. Does sociality matter?
- 11:30** Cleo Bertelsmeier
The ants are coming: the impact of climate change on ant invasions
- 11:50** Johanna Clemencet
Genetic and behavioural evidence for multiple introductions of the invasive ant *Pheidole megacephala* on Réunion Island
- 12:05** *Lunch* **13:10** *Plenary lecture (Aud A)*
- 14:10** Julien Grangier
Carbohydrate and protein competition between native ants and invasive wasps in New Zealand
- 14:30** Claudia Husseneder
Comparison of the genetic structure of Formosan subterranean termite populations from the native and introduced range
- 14:50** Lori Lach
Negating the 'field of dreams' hypothesis: native ants do not recolonize sites managed for plants
- 15:10** Elfie Perdereau
Towards an understanding the history and consequences of a *Reticulitermes flavipes* invasion
- 15:30** Merav Vonshak
Ecological and sociobiological aspects of the little fire ant invasion in Israel

Thursday 12 August, late afternoon: Symposium 18
Auditorium A

Optimization in natural systems: designing nature-inspired algorithms using social insects

Organisers: Madeleine Beekman, The University of Sydney, Australia
David Sumpter, Uppsala Univeristy, Sweden
Jean-Louis Deneubourg, Université libre de Bruxelles, Belgium
Karl Crailsheim, University of Graz, Austria

- 16:15** Stephen C. Pratt (invited)
Collective versus individual cognition in the decision-making algorithms of ant colonies
- 16:50** Barbara Webb (invited)
Discovering insect algorithms
- 17:25** Tanya Latty
Self-organised transportation networks in the Argentine ant (*Linepithima humile*)
- 17:45** Thomas Schmickl
From honeybee behaviour to swarm robotics
- 18:05** Mathieu Lihoreau
Bees and the travelling salesman problem: how tiny brains solve complex routing tasks
- 18:25** Chris Reid
Optimization in natural systems: Argentine ants solve the towers of Hanoi

**Thursday 12 August, late afternoon: Symposium 9
Auditorium B**

Insect-microbe symbioses as evolutionary innovation

Organizers: Henrik H. de Fine Licht, University of Copenhagen, Denmark
Michael Poulsen, University of Wisconsin – Madison, USA

- 16:15** Heike Feldhaar (invited)
The role of endosymbionts in ant nutritional ecology and evolution
- 16:50** Meredith Blackwell (invited)
Passalid beetles: Partitioned microbial gut communities
- 17:25** Ulrich G. Mueller
Ecological genetics of a mutualism: Do leafcutter ants cultivate fungi adapted to local ecological conditions?
- 17:45** Peter H.W. Biedermann
Fungus farming and the evolution of sociality in ambrosia beetles
- 18:05** Stefanie Kautz
Evaluating methods to assess microbe diversity in ants: trade-offs between traditional approaches and 454 pyrosequencing
- 18:25** Martin Kaltenpoth
Teaming up in defense: Symbionts provide antibiotic combination prophylaxis to wasp larvae

Thursday 12 August, late afternoon: Symposium 26
Auditorium C

Trajectories towards sociality across arthropod taxa

Organizers: Ally Harari, The Volcani Center, Bet Dagan, Israel
Tamar Keasar, University of Haifa, Israel

- 16:15** Sara Helms Cahan (invited)
Deconstructing social evolution: Social trajectories and the evolution of colony founding strategies
- 16:50** Yael Lubin (invited)
Evolution of sociality in spiders
- 17:25** Ada Eban-Rothschild
Maternity-related plasticity in circadian rhythms of bumble bee (*Bombus terrestris*) queens
- 17:45** Carlo Polidori
Surprisingly social: eusociality in digger wasps?
- 18:05** Yves Roisin
How individual trajectories may contribute to the rise of a worker caste in termites
- 18:25** Michael Taborsky
Direct and indirect fitness benefits of philopatry and cooperative care in *Xyleborina* (Curculionidae: Scolytinae)

Thursday 12 August, late afternoon: Symposium 17
Auditorium D

The beneficial use of ants and termites in agriculture and nutrition

Organizers: Mogens G. Nielsen, University of Aarhus, Denmark
Joachim Offenberg, University of Aarhus, Denmark

- 16:15** Renkang Peng (invited)
Prospects and future directions for using *Oecophylla* ants as biocontrol agents in horticulture and forestry
- 16:50** Mogens G. Nielsen (last-minute replacement for Tracy Dawes)
Mating strategy and colony rearing of *Oecophylla smaragdina*
- 17:25** Stefanie Jacob
Conservation of an ecosystem-engineer - the mound building termite *Macrotermes bellicosus*
- 17:45** Theodore Evans
Termites and ants boost wheat yield in dryland cropping
- 18:05** Inge Armbrrecht
Inducing seed hauling by ants to enhance the recovery of degraded pastures in Colombia
- 18:25** Joachim Offenberg
Converting pest insects into food: the harvest of edible weaver ants (*Oecophylla smaragdina*) from plantation crops

Detailed program Friday 13 August

08:00	Registration open	<i>Panum</i>
08:55	Announcements & Introduction to the plenary lecture	<i>Aud A</i>
09:00	Plenary lecture by Iain Couzin, Princeton University, USA <i>Information Transfer and the Evolution of Collective Animal Behaviour</i>	<i>Aud A</i>
09:50	<i>Coffee break</i>	
10:20	Parallel Symposia	
	28. Parasites in social insects	<i>Aud A</i>
	16. The genetic basis and consequences of social evolution	<i>Aud B</i>
	19. Behavioral syndromes in social insects: the evolution of behavioral variation between individuals and colonies	<i>Aud C</i>
	3. Going big: large scale spatial and temporal patterns in social insect communities	<i>Aud D</i>
12:05	<i>Lunch</i>	
13:00	Closing remarks and award of the student poster prizes	<i>Aud A</i>
13:15-14:05	Plenary lecture by Kenji Matsuura, Okayama University, Japan <i>The evolution of termite-egg mimicry by termite-ball fungi: How the fungi control termite social behavior</i>	<i>Aud A</i>
14:10	Parallel Symposia 28, 16, 19, 3 (<i>continued</i>)	
15:45	<i>Coffee break</i>	
16:15	Parallel Symposia	
	24. New insights into social evolution: Molecular and genomics approaches to comparative neuroethology	<i>Aud A</i>
	11. Kin structure variation, gene flow and social adaptation	<i>Aud B</i>
	4. Ecological and evolutionary implications of inter-specific, multipartite interactions	<i>Aud C</i>
	5. Major transitions in termite feeding biology and their consequences	<i>Aud D</i>
19:30-01:00	<i>Congress banquet and farewell party</i>	<i>Odd Fellow palace</i>

**Friday 13 August, morning & early afternoon: Symposium 28
Auditorium A**

Parasites in social insects

Organizers: William Hughes, University of Leeds, UK
Mark Brown, Royal Holloway, University of London, UK

- 10:20** Steven M. Valles (invited)
Pathogens infecting the red imported fire ant, *Solenopsis invicta*: biology of newly discovered *S. invicta* viruses
- 10:55** Jay D. Evans (invited)
Genomic approaches to honey bee host-parasite interactions
- 11:30** Benjamin Dainat
Seasonality of predictive pathogen markers for honey bee colony collapse
- 11:50** Crystal Frost
First you see it and then you don't: *Wolbachia* infection in the fungus-growing ants.
- 12:05** *Lunch* **13:00** *Closing Remarks & Plenary lecture (Aud A)*
- 14:10** David M. Mburu
Relationship between virulence and repellency of isolates of entomopathogens to the termite *Macrotermes michaelseni*
- 14:30** H. Michael G. Lattorff
Host population size mediates parasite transmission in a social insect
- 14:50** David P. Hughes
Parasites in ants: from regional to global and back through time
- 15:10** Simon Tragust
Laboulbenia infections in *Lasius neglectus*: an invading pathogen of an invasive ant
- 15:30** Yuko Ulrich
Multi-phase filtering and transmission of a mixed infection in bumblebee colonies

**Friday 13 August, morning & early afternoon: Symposium 16
Auditorium B**

The genetic basis and consequences of social evolution

Organizers: Tim Linksvayer, University of Copenhagen, Denmark
Anna M. Schmidt, University of Copenhagen, Denmark

- 10:20** Laurent Keller (invited)
The interaction between a single genetic element and social environment on social organisation in fire ants
- 10:55** Allen J. Moore (invited)
Social evolution in a subsocial beetle - quantitative to molecular genetics of parenting
- 11:30** Jeremy Field
Environmental and genetic components of a major evolutionary transition: sociality in sweat bees
- 11:50** Romain Libbrecht
Don't forget the King: Males also influence caste allocation and sex ratio in ants
- 12:05** *Lunch* **13:00** *Closing Remarks & Plenary lecture (Aud A)*
- 14:10** Chris R. Smith
Reproductive division of labor in a harvester ant: from genome to genes
- 14:30** Jürgen Liebig
Genome sequencing and comparison of the socially distinct ant species *Harpegnathos saltator* and *Camponotus floridanus*
- 14:50** Brielle Fischman & S. Hollis Woodard
Molecular signatures of selection reveal convergent and lineage-specific paths to eusociality
- 15:10** Johannes Gowin
Molecular basis for reproductive division of labour in a lower termite
- 15:30** Michael A. D. Goodisman
Sociality is linked to rates of protein evolution in a highly social insect

Friday 13 August, morning & early afternoon: Symposium 19
Auditorium C

Behavioral syndromes in social insects: the evolution of behavioral variation between individuals and colonies

Organizers: Anna Dornhaus, University of Arizona, USA
Susanne Foitzik, Ludwig Maximilians University, Munich, Germany

- 10:20** Lars Chittka (invited)
Personalities, bee-alities and banalities
- 10:55** Andrew Sih (invited)
Behavioral syndromes in social insects: lessons from and for other systems
- 11:30** Terezinha M.C. Della Lucia
Task reversion in waste workers of *Atta sexdens rubropilosa* Forel (Hymenoptera: Formicidae)
- 11:50** Jennifer Jandt
Bumble bee space use, body size, and response thresholds: Variation is the key to colony success
- 12:05** *Lunch* **13:00** *Closing Remarks & Plenary lecture (Aud A)*
- 14:10** Elizabeth L. Franklin
Tandem running: who takes the lead?
- 14:30** Etya Amsalem
Reproductive inhibition as a function of group-size in *B. terrestris*: α -worker tries harder while β -worker runs faster
- 14:50** C. Tate Holbrook
Division of labor scales with colony size in the seed-harvester ant *Pogonomyrmex californicus*
- 15:10** Ana B Sendova-Franks
Behavioural syndromes and activity levels in ant colonies
- 15:30** Adam J. Siegel
The link between the ovary, sucrose sensitivity, and foraging division of labor in the honey bee, *Apis mellifera*.

**Friday 13 August, morning & early afternoon: Symposium 3
Auditorium D**

Going big: large scale spatial and temporal patterns in social insect communities

Organizers: Robert Dunn, North Carolina State University, USA
Terry McGlynn, California State University, USA

- 10:20** Alan N. Andersen (invited)
Regional processes as drivers of ant community structure
- 10:55** Nathan J. Sanders (invited)
Macroecology of the myrmecofauna
- 11:30** Corrie S. Moreau
Biogeography of ants in the Australian wet tropics
- 11:50** Heloise Gibb
How does habitat complexity affect resource use? A test with phylogenetically distinct ant assemblages
- 12:05** *Lunch* **13:00** *Closing Remarks & Plenary lecture (Aud A)*
- 14:10** Milan Janda
The structure of biodiversity in the Melanesian ant fauna: scaling up from populations to continents.
- 14:30** Thibaut Delsinne
Effects of experimental rainfall exclusion on a diverse ant assemblage from Ecuadorian mountain rainforest.
- 14:50** Isabel Alves-dos-Santos
Climatic changes impact on two subspecies of *Melipona bicolor* (Apidae, Hymenoptera) through ecological niche modeling
- 15:10** Eliana M. Canello
Characterizing termite assemblages from 15 rainforest sites 6 semideciduous and 3 deciduous sites in Atlantic Dominion.
- 15:30** Carlos R. F. Brandão
Distribution of traits and assembly rules of leaf-litter ant communities

Friday 13 August, late afternoon: Symposium 24
Auditorium A

New insights into social evolution: Molecular and genomics approaches to comparative neuroethology

Organizers: Andrew Barron, Macquarie University, Australia
Christina Grozinger, Pennsylvania State University, USA

- 16:15** Yehuda Ben-Shahar (invited)
Chemosensory sociogenetics: how insects sense their social environment
- 16:50** C Giovanni Galizia (invited)
Honeybee odor coding and learning costs – neural networks and circadian intelligence
- 17:25** Dries Cardoen
Microarray analysis provides unprecedented insight into the physiology of reproductive and non-reproductive honeybees
- 17:45** Gabrielle A. Lockett
Involvement of DNA methylation in memory processing in the honey bee (*Apis mellifera*)
- 18:05** Nicholas L. Naeger
Appointment keeping and the circadian anticipatory state: microarray analysis of time-trained forager honey bees.
- 18:25** Guy Bloch
Molecular dynamics and social regulation of context-dependent plasticity in the circadian clockwork of the honey bee

Friday 13 August, late afternoon: Symposium 11
Auditorium B

Kin structure variation, gene flow and social adaptation

Organizers: Heikki Helanterä, University of Helsinki, Finland
Perttu Seppä, University of Helsinki, Finland
Lotta Sunström, University of Helsinki, Finland

- 16:15** Michel Chapuisat (invited)
Exploring the causes and consequences of social structure variation in ants
- 16:50** Alan Grafen (invited)
Is gene flow merely a spanner in the works of adaptation?
- 17:25** Jessica Purcell
Temporal shifts in queen number in a socially polymorphic ant population
- 17:45** Natapot Warrit
Population structure of *Apis cerana* in Thailand: an interpretation to assess *Varroa* parasitism pattern
- 18:05** Ken R. Helms
Geographic variation in conflict, cooperation, and cooperative breeding among unrelated ant queens
- 18:25** Rick P. Overson
Variation in social structure within and between populations of the harvester ant *Pogonomyrmex californicus*

Friday 13 August, late afternoon: Symposium 4
Auditorium C

Ecological and evolutionary implications of inter-specific, multipartite interactions

Organizers: Raphael Boulay, Doñana Biological Station, Spain
Jerôme Orivel, CNRS, France

- 16:15** Nico Blüthgen (invited)
Networks between social insects and plants: patterns and processes
- 16:50** Paulo S. Oliveira (invited)
Behavioral ecology and multitrophic interactions: Foliage-dwelling ants mediate plant colonization by insect herbivores
- 17:25** Aniek B.F. Ivens
Symbiont genetic diversity and reproductive mode in an ant-aphid mutualism
- 17:45** Pierre-Jean G. Malé
Evolutionary conflicts and sanctions between a neotropical ant and its host-plant
- 18:05** Christine A. Johnson
The effect of geographic variation in parasite and host range on co-evolutionary trajectories
- 18:25** Marielle A. Postava-Davignon
Interactions between microbes and *Nasutitermes acajutlae* (Insecta:Isoptera): are there advantages to arboreal nesting?

Friday 13 August, late afternoon: Symposium 5
Auditorium D

Major transitions in termite feeding biology and their consequences

Organizer: Paul Eggleton, Natural history Museum, London, UK

- 16:15** Andreas Brune (invited)
Nitrogenous soil components as dietary resource of soil-feeding termites
- 16:50** Christine A. Nalepa (invited)
Evolution of termite eusociality shifted nitrogen allocation
- 17:25** David Bignell
Termite gut structure and associations with mutualists: 33 years in wonderland
- 17:45** Duur K. Aanen
The major transition to termite fungiculture
- 18:05** Thomas Bourguignon
Evolution of termite feeding behaviour in a phylogenetic perspective
- 18:25** Hirofumi Watanabe
Lignocellulose digestion and size reduction of the body and the midgut of termites

List of participants

With e-mail addresses and details of their oral or poster presentations

Name	E-mail address	Prese- ntation	Sym- posium
Aanen, Duur K.	duur.aanen@wur.nl	Oral	5
Aase, Anne Lene	anne.aase@umb.no	Poster	21
Abbot, Patrick	patrick.abbot@vanderbilt.edu	Oral	10
Abril, Silvia	silvia.abril@udg.edu		
Adams, Rachelle	RAdams@bio.ku.dk	Oral	12
Ahrenfeldt, Erica	ericajuel@hotmail.com		
Akamatsu, Tadaaki	eisen_drgoon@yahoo.co.jp		
Alban, Maisonnasse	alban.maisonnasse@avignon.inra.fr	Oral	21
Almond, Edward	e.almond@uea.ac.uk	Oral	13
Alonso, Leeanne	l.alonso@conservation.org	Poster	3
Alpedrinha, Joao	joao.alpedrinha@zoo.ox.ac.uk	Poster	11
Alves-dos-Santos, Isabel	isabelha@usp.br	Oral	3
Alves, Denise	daalves@ib.usp.br	Poster	17
Amdam, Gro	Gro.Amdam@asu.edu	Invited	13
Amor, Fernando	fernnamor@terra.es	Poster	31
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Uematsu, Keigo	keigouematsu@gmail.com	Poster	13
Ueno, Takayuki	t-ueno@biol.s.u-tokyo.ac.jp	Poster	15
Ugelvig, Line Vej	lvugelvig@bio.ku.dk	Poster	4
Ulrich, Yuko	yuko.ulrich@env.ethz.ch	Oral	28
Valles, Steven	steven.valles@ars.usda.gov	Invited	28
van Oudenhove, Louise	oudenhove@biomserv.univ-lyon1.fr	Oral	1
van Oystaeyen, Annette	annette.vanoystaeyen@bio.kuleuven.be		
van Zweden, Jelle	j.vanzweden@sussex.ac.uk	Poster	22
Vantaux, Amélie	Amelie.Vantaux@bio.kuleuven.be	Poster	4
Vargo, Ed	ed_vargo@ncsu.edu	Poster	2
Vattulainen, Ulla	ulla.vattulainen@helsinki.fi	Poster	13
Velonà, Alessandro	alessandro.velona2@unibo.it	Poster	10
Velthuis, Hayo	hhvv@xs4all.nl		
Vergoz, Vanina	v.vergoz@gmail.com	Poster	25
Verza da Silva, Sandra	sandraverza@yahoo.com	Poster	9
Vetillard, Angélique	angelique.vetillard@univ-jfc.fr	Poster	28
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Vitikainen, Emma	emma.vitikainen@gmail.com	Poster	11
Vojvodic, Sijetlana	svo@life.ku.dk	Poster	28
von Beeren, Christoph	vonbeeren@arcor.de	Poster	27
Vonshak, Merav	meravwei@post.tau.ac.il	Oral	2
Wang, John	john.wang@unil.ch	Poster	15
Ward, Philip	psward@ucdavis.edu	Oral	12
Warrit, Natapot	ich108@hotmail.com	Oral	11
Watanabe, Dai	d0971306@ems.u-toyama.ac.jp	Poster	26

Name	E-mail address	Presentation	Symposium
Watanabe, Hirofumi	hinabe@affrc.go.jp	Oral	5
Wcislo, Bill	WcisloW@si.edu		
Webb, Barbara	bwebb@inf.ed.ac.uk	Invited	18
Weiner, Susan	susan.weiner@tufts.edu	Poster	2
Wenseleers, Tom	tom.wenseleers@bio.kuleuven.be	Invited	8
Wenzel, John	wenzel.12@osu.edu	Poster	8
Westhus, Claudia	claudia.westhus@gmail.com	Poster	27
Whalen, Molly	molly.whelen@finders.edu.au	Poster	1
Wheeler, Diana	dewsants@ag.arizona.edu		
Wiernasz, Diane	dwiernasz@uh.edu	Oral	31
Williamson, Michael	mrwilliamson@bio.ku.dk		
Wilson-Rich, Noah	noahwilsonrich@gmail.com	Poster	27
Wnuk, Andrzej	awnuk@nencki.gov.pl	Poster	30
Wolf, Jana	Jana.Wolf@rub.de		
Wolf, Stephan	stephan.wolf@zoologie.uni-halle.de	Poster	11
Wolschin, Florian	f.wolschin@gmail.com	Poster	15
Woodard, S. Hollis	euglossine@gmail.com	Oral	16
Wossler, Theresa	wossler@sun.ac.za	Poster	22
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Wu, Wen-Jur	wuwj@ntu.edu.tw		
Wum, Yannick	yannick.wum@unil.ch	Poster	15
Wystrach, Antoine	wystrach@cict.fr	Poster	30
Yagound, Boris	boris.yagound@hotmail.fr	Oral	8
Yamashita, Cintia	ycintia@usp.br	Poster	25
Yanagawa, Aya	ayanagawa@rish.kyoto-u.ac.jp	Poster	28
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Yokoi, Tomoyuki	yokoi@cc.okayama-u.ac.jp	Poster	21
Yoshimura, Masashi	myoshimura@ant-database.org	Poster	12
Yoshimura, Tsuyoshi	tsuyoshi@rish.kyoto-u.ac.jp	Poster	2
Zayed, Amro	zayed@yorku.ca	Oral	15
Zhang, Guojie	zhanggj@genomics.org.cn	Poster	16

Sunday 8 Aug		Monday 9 Aug		Tuesday 10 Aug		Wednesday 11 Aug		Thursday 12 Aug		Friday 13 Aug	
08:00	Welcome reception <i>Panum</i> (until 22:00)	USSSI International Committee meeting	Meet at <i>Imperial cinema</i>	Registration open <i>Panum</i>	Registration open <i>Panum</i>	Registration open <i>Panum</i>	Registration open <i>Panum</i>	Registration open <i>Panum</i>	Registration open <i>Panum</i>	Registration open <i>Panum</i>	Registration open <i>Panum</i>
08:55			President's introduction	Plenary lecture	Hamilton award	Plenary lecture	Plenary lecture	Plenary lecture	Plenary lecture	Plenary lecture	
09:30			Keynote address	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
09:50											
10:20						Remembering Ross Crozier					
10:30											
10:55											
11:30											
12:05											
13:00		Lunch									
13:10		USSSI section meetings	Lunch								
14:10		Plenary lecture	Plenary lecture								
15:15		Symposia 1, 14, 23, 27	Symposia 7, 12, 20, 21	Excursions	Symposia 2, 6, 15, 22	Symposia 3, 16, 19, 28					
15:45		Coffee break	Coffee break		Coffee break	Coffee break					
16:15	Registration open <i>Panum</i>	Symposia 1, 14, 23, 27	Symposia 8, 10, 13, 25		Symposia 9, 17, 18, 26	Symposia 4, 5, 11, 24					
17:00		Coffee break									
17:30		Symposium 29									
18:40											
19:00											
19:30			Poster session 1 and light meal		Poster session 2 and light meal						
20:00											
20:30			Round table sessions	Free evening <i>Thovli</i>	USSSI General Assembly meeting	Congress dinner <i>Odd Fellow Palace</i> (until 01:00)					