# IUSSI, North-west European Section
## (International Union for the Study of Social Insects)
# Winter Newsletter 2012

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## Officers of the British Section of the IUSSI

**President** Professor Jeremy Field, School of Life Sciences, University of Sussex, Falmer, Brighton BN1 9QG, U.K.
E-mail: J.Field@sussex.ac.uk
Webpage: http://www.lifesci.sussex.ac.uk/research/field_group/Jeremy_Field.html
*Contact him about:* inspiration, leadership, anything too challenging for Elva or Eamonn to deal with.
**Secretary** Dr. Eamonn Mallon, Dept. of Biology, University of Leicester, LE1 7RH, U.K.
Email: ebm3@le.ac.uk
Webpage: http://www.le.ac.uk/bl/ebm3/homepage.html
*Contact him about:* newsletter, meetings, general information.
**Treasurer** Dr Elva Robinson, York Centre for Complex Systems Analysis, Department of Biology, Area 17, University of York, Heslington, York YO10 5DD,U.K.
E-mail: Elva.Robinson@yccsa.org
Webpage: http://bioltfws1.york.ac.uk/biostaff/staffdetail.php?id=ejhr*Contact her about:* membership, student grants.
**Webmaster** Dr. David Nash, Centre for Social Evolution, Department of Biology, Universitetsparken 15, DK-2100 Copenhagen East, Denmark.
E-mail: DRNash@bio.ku.dk
*Contact him with*: information and suggestions for the web site.
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## Section news

NW European IUSSI Winter Meeting 2012
The Winter 2011 meeting of the North-West European section of IUSSI will take place at the Institute of Zoology, London on Friday, 10th December. Please see the program at the end of the newsletter.

### Nomination of new section officers

The current officers' term ends at this year's winter meeting. Mark Brown, Bill Hughes and Elli Leadbeater have been nominated as president, treasurer and secretary respectively for the next 3 year term. If there are any other nominations please sent them to Eamonn. If there are there will be a vote at the AGM, otherwise Mark, Bill and Elli will be confirmed.

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## Lab News

### Copenhagen – Centre for Social Evolution

The Centre for Social Evolution in Copenhagen led by **Koos Boomsma** has survived yet another year of a building reconstruction, which has again been delayed – but we hope it will be finished by the time of the next newsletter! In the meantime there has been quite a large turnover of people in the group since a year ago, when you last heard from us.
The CSE theme "Farming and Husbandry" which is led by **Michael Poulsen** and **Morten Schiøtt** has both gained and lost people in the previous year. **Guojie Zhang** from BGI (Beijing Genomic Institute) has taken up a Marie Curie funded position to work on gene expression and methylation in different castes of leaf-cutter ants. Morten and postdoc **Sanne**

**Nygaard** are busy analyzing five newly available genomes of fungus growing ants. **Panagiotis (Panos) Sapountzis** who arrived last year to work on metagenomics of the bacterial gut community of fungus-growing ants has received a Marie Currie fellowship to stay for two more years as a postdoc. PhD student **Pepijn Kooij** spent one more field season in Panama and continues his analysis of the microbiome of faecal droplets of leaf-cutting ants. As for the termite specialists, **Saria Otani** started a Masters' project on termite gut microbiomes working with Michael. **Thijs Gruntjes,** a visiting Masters' student from Utrecht University (The Netherlands) joined the group for nine months to study gut bacteria in termites together with Michael and Panos. Thijs, Saria and Michael are getting ready for a field trip to South Africa to collect termites early next year. Another visiting Master's student from the Netherlands, **Jeroen Pullens** spent four months at the CSE working on cellulase gene expression in leaf-cutting ants with Pepijn, and has already returned to the Netherlands. Former PhD student **Sandra Breum Andersen** defended her thesis on ant-microbial interactions, and has moved on to a postdoc position at DTU (Denmark's Technical University) and Oxford University. **Sze Huei (Zoe) Yek** also moved on right after her PhD defence on "disease challenges and defences of leaf-cutting ants" to postdoctoral work at the University of Pretoria (South Africa) to study a wood wasp causing damage in timber. **Aniek Ivens,** who is doing her PhD on the mutualism between the ant *Lasius flavus* and root aphids partly in Copenhagen and partly in Groningen (The Netherlands), handed in her thesis and is getting ready to defend it in Groningen on 23rd November.

The "Evolutionary Medicine" group - consisting of PhD student **Birgitte Hollegaard Hartsteen**, postdoc **Sean Byars** and Koos - has been joined by **Matilde Winther-Jensen** who started her Masters' project on polycystic ovary syndrome in early 2012.

CSE has also been enriched by the arrival of a Fullbright fellow, **Manvir Singh** from the U.S.A, who has started working on a theoretical research project with Koos on corrupt policing behaviour.

**Marlene Stürup** returned from Perth after spending five months studying honeybee sperm together with **Susanne den Boer** and Boris Baer, although she also managed to fit in quite a bit of kite-surfing. We are also looking forward to the return of Susanne den Boer to Copenhagen in the spring.

Masters' student **Sarah Carlsen** has joined the "Invasive Social Syndromes" group led by **Jes Søe Pedersen** to work on the population genetics of the ant *Myrmica rubra*, which will complement the comparative studies of supercolonial and "normal" *M. rubra* nests done by PhD student **Dóra Huszár**, who is also working on a theoretical project on ant life history evolution. **Rasmus Stenbak Larsen** is now working as a research assistant in the group, helping various projects both in the lab and in the field. The group had a successful field season collecting *M. rubra* in Denmark, and Rasmus and Jes recently returned from a trip to Turkey to collect *Lasius turcicus* ants for a project in collaboration with Claire Morandin and Heikki Helanterä in Helsinki. PhD student **Luigi Pontieri,** who works on invasive *Monomorium* ants, is currently spending three months at Penn State University working with Tim Linksvayer, a previous postdoc of CSE.

At the end of June, CSE threw a party to say a proper farewell to **Patrizia D'Ettorre**, who will now spend 100% of her time at the University of Paris 13, where she became a full professor in 2010. Patrizia's final departure was preceded by that of her remaining students at CSE, who completed their projects in the last year. **Nick Bos** has embarked on a postdoc in team ANTZZ at the University of Helsinki (Finland), after defending his PhD thesis on learning and perception of chemical cues in social insects. He now works on life history trade-offs of *Formica exsecta* ants. **Jelle van Zweden** completed the last six month of his postdoctoral work on nest mate recognition and chemical communication in social insects, and has now moved on to a new postdoctoral position at KU Leuven (Belgium). After Patrizia's departure, **David Nash** has now taken over the "Social Recognition" group at CSE, although the GC-MS lab is *still* closed because of the renovations.

In the CSE theme "Social Parasitism", also led by David, **Anne Andersen** completed her Master's thesis on conservation genetics of the large blue butterfly *Maculinea arion* and is now trying to get funding for a PhD position to continue her successful work on *M. arion*. PhD student **Andreas Kelager** has continued with his climate niche modelling of *Maculinea alcon* and its hosts, and has also managed to collect a good set of samples (many from European collaborators) to combine this with a population genetics study of the butterfly and its host plant. He also organized some summer fieldwork on *Maculinea alcon* in the first National Park established in Denmark, which included bachelor projects by **Daniella Humm**, **Ea Hørsving**,

**Joachim Lassen** and **Maria Mikkelsen**. Ea, Joachim and Maria have already completed their projects, and got top marks in their exams last week. PhD student **Sämi Schär** had a good field season this year, collecting over 1000 DNA and live specimens of several different blue butterflies with different associations with ants, plus their immature stages. David and PhD student **Janni Larsen** spent a few weeks in Brazil in March, checking out field sites and establishing contacts for Janni's project on socially parasitic *Acromyrmex* leaf-cutting ants. Janni also carried out fieldwork in Panama in May on the socially parasitic *Acromyrmex insinuator*, and back in Copenhagen she completed an experiment on host colony choice by parasite queens. **Joanito Liberti** started his Masters' thesis on endosymbiont bacteria of socially parasitic *Megalomyrmex* ants and their fungus growing ant hosts together with postdoc **Rachelle Adams**.
Professor **Jørgen Eilenberg** at the Frederiksberg campus is busy with writing a book about biological control together with Ann Hayek. In the same group, Associate Professor **Nicolai Vitt Meyling** started exploring interactions between the pathogenic fungi of the genus *Metarrhizium* and plant roots. New PhD student **Antoine Lecocq** started a project on disease and transmission in honey bees together with Associate Professor **Annette Bruun Jensen**. In the meantime PhD student **Joanna Malagocka** is on leave, busy taking care of her newborn twin girls☺. **Anja Amtoft Wynns** defended her PhD thesis on diseases of solitary bees, and will start a postdoc on the diversity of entomopathogenic fungi associated with strawberries and apples, and their possible use in biocontrol of pests, working partly in Denmark and partly in Brazil.
Last, but definitely not least, Koos Boomsma has just heard that he was successful in applying for an Advanced ERC grant on "Attine ANT SymbiomeS (ANTS)", which will provide considerable support for CSE's various 'omics' programs.

**The Bourke Group (University of East Anglia)**
Over the Spring and Summer, we hosted two visiting undergraduate students from Nancy, France, **Pierre-Louis Hein** and **Mathilde Lasfargue**. Pierre assisted **Liam Crowther**, who conducted a field study of the recent UK natural invasive, the Tree Bumble Bee (*Bombus hypnorum*), for his MSc project, supervised by Andrew. Mathilde assisted **Edd Almond** and **Tim Huggins** in their project on the effect of social conflicts on queen ageing and gene expression in *Bombus terrestris*. Both did a great job and we wish them well in their future studies. Our partners in Edd and Tim's project, **Joel Parker** and **Gabrielle Lockett** at the School of Biological Sciences, University of Southampton, have now moved on. Joel has moved to the US to take up a faculty position at SUNY-Plattsburgh, New York State, and Gabrielle has started a new postdoc in the Faculty of Medicine at the University of Southampton; all good wishes to both in their new positions. Among the PhD students here at UEA, **Jacob Holland** has just started the fourth year of his project on the control of life-history events in the colony cycle of the bumble bee *Bombus terrestris*, while **David Collins** and **Henry Ferguson-Gow** have just started their third years, their projects being on, respectively, the role of microRNAs in the caste determination of bees, and evolution and diversification of ants from a comparative perspective. Henry remains in London until Spring 2013, spending time with the CASE partner co-supervisors of his project, who are **Kate Jones** at UCL and **Seirian Sumner** (now at the University of Bristol, having moved from the Institute of Zoology, Zoological Society of London). Along with other friends and colleagues in IUSSI, Andrew recently attended a workshop held in York for grantholders in the Insect Pollinators Initiative. The project he is involved with is on movements of bumblebees in relation to fine-scale landscape features and is collaborative with **Claire Carvell** and **Matt Heard** at the Centre for Ecology and Hydrology, Wallingford, Seirian in Bristol, **Jinliang Wang** at the Institute of Zoology and **Stephanie Dreier** at the Institute of Zoology/University of Bristol. The data gathering part of this project is largely complete, and it now looks set to enter an exciting phase of data analysis.

**TEAM::ANTZZ (Helsinki)**
Following the recent expansion of TEAM::ANTZZ after becoming a part of the Centre of Excellence in Biological Interactions (CoE), research in our group has diversified to encompass studies of gene expression and immunology.

**Lotta Sundström**, together with our new recruits, Post-docs **Dalial Freitak** and **Nick Bos**, and PhD student **Dimitri Stucki**, set out on their first field-season in Tvärminne Zoological Station this year in a quest to establish an integrated understanding of immunocompetence in *Formica exsecta.* Their main goal was to investigate host-parasite interactions and life-history trade-offs related to immunocompetence with respect to sex/caste and degree of inbreeding, using well studied island populations of this species. Two master students are also involved within the framework of immunocompetence research. **Sini Vuorensyrjä** works on trade-offs between immune defense and oxidative stress in *F. exsecta*, by looking at gene expression of selected antioxidant and immune defense genes combined with patterns of ant mortality. **Unni Pulliainen** is investigating the possible effects of inbreeding on brood care, mortality, learning and gene expression in the same species.

**Kalle Trontti** is finalizing his current post-doc funding period and is wrapping up the past three years on paper. At the same time he has expanded his research from candidate gene expression studies to high throughput transcriptomics of *Formica exsecta*, and other species. New directions also include characterization of novel ant viruses and participation in the genome project of *F. exsecta*. This work was done with a great input by our recently appointed bioinformatician, **Kishor Dhaygude**, who has been busy working on assembly and annotation part of *F. exsecta* transcriptome.

While supervising current PhD projects on reproductive conflicts and egg cannibalism, and in genomics and transcriptomics, **Heikki Helanterä**, has also started a new CoE collaboration on the evolution of social control mechanisms, co-supervising a PhD student Petri Rautiala with Mikael Puurtinen from University of Jyväskylä, Finland. **Jenni Paviala** continues her PhD with Heikki focusing at the moment on the subject of immune gene evolution in the invasive Argentine ant *(L. humile)* under co-supervision of Lumi Viljakainen from University of Oulu, Finland. **Claire Morandin** is currently working in Japan, collaborating with Dr Alexander Mikheyev head of the Ecology and Evolution Unit at Okinawa Institute of Science and Technology. A new master student, **Noora Parkkonen** from Helsinki University has just started her project on colony level variation in caste specific gene expression in Formica ants, co-supervised by Heikki and Claire.

**Jonna Kulmuni** is finalizing her last manuscript and sending her PhD thesis for pre-examination before having another baby, due in December. Her thesis is titled: "Genetic differences between species and their implications for speciation and adaptation in ants" and consists of two subprojects. One of them is looking at peculiar consequences of hybridization in wood ants and the other concentrates on the evolution of chemosensory protein genes in ants in general. Jonna is planning to defend her PhD some time next spring in Oulu, Finland. Post-doc **Helena Johansson** continues to piece together a population genetic data set on the ant *Formica fusca*, coming to focus on the within-nest social consequences of high dispersal and reproductive time stress in short-lived habitats. More recently, she has also been involved in identifying microbiota from the recently assembled *F. exsecta* transcriptome. Surviving her first and extremely productive summer in Tvärminne Zoological Station, **Jana Wolf** has swapped field work for lab work and is analyzing data on queen morphology and colony kin structure in red ant *Myrmica ruginodis* as a part of her PhD on divergence in this species supervised by **Perttu Seppä**. In a meantime, Perttu continues his projects on ant and wasp population genetics.

PhD student **Eva Schultner** has completed all her genotyping work and will now focus fully on analyzing the data collected during three field seasons at Tvärminne Zoological Station to reveal differences in levels of larval cannibalism in *Formica* ants. Also well into her PhD, **Martina Ozan,** is working her way through the tons of her own data after spending field season looking at reproductive inhibition among queens of *F. fusca*. **Annu Tertsonen** is currently in Paris, analyzing cuticular hydrocarbon profiles of the same species in collaboration with Patrizia d'Ettorre, as part of her Master's thesis investigating environmental vs. genetic basis of brood odours. Master student, **Jenni Lehtimäki** is currently analyzing her results on the effect of herbicides (more specifically glyphosate) on adult mortality, brood development and colony performance in *F. fusca*, supervised jointly by Jouni Sorvari,

University of Eastern Finland, and **Lotta Sundström. Lotta** is busy supervising, being a co-director of the CoE and the new director of the graduate school in ecology and evolution.

**Anton Chernenko** has successfully defended his PhD thesis last May, and is set to start studying cryptic speciation in Malagasy beetles.

**The Hughes Lab (University of Sussex)**
The Hughes Lab is on the move, with Bill leaving Leeds to join the University of Sussex. Officially the move happens at the end of November, although in practice some of us have been in our new home for several weeks now. We've had six very productive years in Leeds, but are extremely excited about joining Sussex. Having suffered through an appalling spring and summer in Leeds, the bees are especially delighted at moving south to what has famously been described as the "California of England". Other news is that **Adam Smith** has completed his Marie Curie Fellowship with us studying the neurobiology of leaf-cutting ants, and has taken up a tenure-track position as Assistant Professor at George Washington University. **Sophie Evison** has completed her postdoc investing the effects of diversity on host-parasite interactions in honeybees, and is now on a Teaching and Research Fellowship at the University of Leeds. Just this week, **Kat Roberts** successfully defended her thesis on *Nosema* transmission and evolution in honeybees, with Rob Paxton as her external. Kat has already started a postdoc position with Mike Boots at the University of Exeter in Falmouth, continuing to work on parasite evolution. Four of our PhD students are now entering the final months of their PhDs. **Pete Graystock** has been studying pathogen spillover in bumblebees, and we're currently watching with bated breath as he sees how many data chapters he can juggle at the same time. **Kirsten Foley** has been studying virulence and competition of stonebrood fungal parasites of honeybees, and had her first paper out earlier this year in J Invert Pathol showing the importance of pollen diversity for the disease resistance of bees. **Claire Asher** is working with Seirian Sumner and is now firmly immersed in the transcriptomes of her dinosaur ants. **Rowena Mitchell** has a little longer to run, and is currently writing up a busy field season of work studying development and caste bias in honeybees, before switching back to leaf-cutting ants for her final experiment. **Chris Tranter** and **Jasmine Parkinson** are now in the second years of their PhDs studying disease resistance in ants and symbiont dynamics in mealybugs respectively. And finally, we have a new arrival: **Victoria Norman** has just started her PhD with us on caste determination in leaf-cutting ants, and is looking forward to digging trips in Panama and Brazil. Chris, Jasmine and Victoria are now all based in Sussex, while Pete, Kirsten and Rowena will be finishing off their theses in Leeds.

**The Brown Lab (Royal Holloway, University of London)**
What a horrendous summer! Still, despite the weather we've all been busy and managed to get what we hope will be some interesting data, some of which we talked about at the wonderful European IUSSI meeting in Italy and some the week after at the EURBEE meeting in Halle (presentations by Matthias Fürst, Gemma Barron, Mark Brown, Inti
Pedroso, Chris Pull). While nobody new has joined us since the last newsletter, both Henry Lin and Chris Pull graduated with excellent Masters in Research degrees. Henry has gone back home to Taiwan, where we hope he's finding some good social insects, and Chris has moved to Sylvia Cremer's lab at the IST in Austria, where he has started a PhD. We miss them both, but wish them luck for the future. In other sad (for us!) news, Inti Pedroso, our bioinformaticist and general analytical genius (when he's not playing with bees and worms) has been offered an excellent position on the other side of London, and will be leaving us in January 2013. Consequently, there may well be a short-term (6-8 month) post-doc position available with myself and Seirian Sumner - watch this space! Catherine Jones and Joe Colgan are both busy writing up, with the aim to hand in their PhD theses in March 2013. Fingers crossed! Gemma and Matthias remain busy in the lab, counting and weighing bees, and looking at RNA despairingly.... We're all looking forward to the winter meeting in London, and the chance to catch up with everyone then!

**The Wurm Lab (Queen Mary, University of London)**
A new social insect lab has sprung up in East London. After been a member of the Keller lab at University of Lausanne for 7 years I am happy to join the vibrant london social insect

community as I am building up my own lab at Queen Mary University. We will continue to apply modern genomics tools to understand social evolution.
http://yannick.poulet.org

**The Robinson Lab (University of York)**
The ant research team in York is continuing to grow, with the arrival of new PhD student **Duncan Procter**, who will be working in collaboration with the Forestry Commission on functional connectivity in fragmented woodlands using *Formica lugubris* in the North York Moors as a case study. Both **Sam Ellis** and **Yi-Huei Chen** had rather damp field seasons this year, in the Peak District and the Swiss Jura, respectively. **Zoe Cook** is moving in the final stages of her PhD using network analysis approaches to modelling the costs and benefits of decentralisation in polydomous species. **Phillip Buckham-Bonnet** is writing up his MSci on foraging trail organisation in Pharaoh's ants and *Lasius niger*. **Elva Robinson** has been working on her own inclusive fitness, by producing a son, David, in August this year.

**The Sumner lab (Institute of Zoology, ZSL / Bristol)**
Since the last IUSSI newsletter there has been a large amount of change within the our group. Seirian has just come to end of 10 years working at the Institute of Zoology and is now moving on to pastures new with her appointment as Senior Lecturer in Behavioural Biology at the University of Bristol. Our group is now split between IoZ and Bristol!
After a year on maternity leave Leverhulme Fellow Eli Leadbeater is now back at IOZ continuing her fellowship. She is currently setting up bumblebee foraging experiments, whilst also planning an upcoming trip to Texas to work on some unpleasantly aggressive tropical wasps!
Stephanie Dreier is near completion of her genetic work on bumblebees, as postdoc on the Insect Pollinators Initiative, in our project with Claire Carvell (CEH), Matt Heard (CEH) and Andrew Bourke (UEA); watch this space for some great data which may provide some key results for bee conservation.
Thibault Lengronne (co-supervised with Laurent Keller, Lausanne) had his first paper published in 'Ecology and Evolution', discussing the effects of seasonal constraints on population genetic structure in paper wasps. He is now glued to his computer in the final preparations of his remaining manuscripts and thesis which is due to be handed in early next year.
Henry Ferguson-Gow (co-supervised by Andrew Bourke (UEA) and Kate Jones (UCL)) has made great progress with his PhD mission to construct an ant supertree, if only there weren't so many damn species!
Claire Asher (co-supervised with Bill Hughes, Sussex) has now begun writing up her thesis, and continues work on several manuscripts. She is also preparing to analyse our new genome sequence and transcriptome data for the dinosaur ants, to understand the molecular basis of reproductive dominance and division of labour. In the new year, Claire will also be appearing as a technical expert in a BBC documentary investigating solider ant behaviour in a leaf cutter ant colony.
Genomics work on other social insects continues, with a freshly annotated genome sequence of *Polistes canadensis* (with bioinformaticians in Barcelona and Babraham Institute), on-going transcriptomic and DNA methylation analyses of *Polistes* by Solenn Patalano with Wolf Reik in the Babraham Institute, Cambridge, and transcriptomics of parasite-induced changes in bumble-bee behaviour by Inti Pedroso, with Mark Brown at Royal Holloway.
Now in the second year of her PhD Emily Bell (co-supervised with Max Reuter, UCL) has completed her first field season working investigating phenotypic plasticity in both Spanish and Panamanian populations of *Polistes*, again watch this space for some results coming your way soon.
Finally we welcome Anna Heath, a masters student from UCL, to the group. She is starting her MSci research project which will investigate the attraction of ants to electrical sources. In particular she will be looking at the native species of *Lasius niger* and the unicolonial species *Lasius neglectus.*

## Conference reports

### IUSSI European meeting

In August 2012, the combined European sections of the IUSSI held their 12th European meeting in the small spa town of Montecatini Terme in Tuscany. This was my first international conference and it was an absolutely beautiful setting for the IUSSI meeting. It came complete with beautiful surroundings, sublime Italian food and wine, and large imposing but well-constructed Romanesque buildings. When I first arrived the weather was almost surreal, the first day started as a great thunderstorm burst forth from the heavens, bombarding the surroundings below with lashings of thunder and torrential rainfall, only to dissipate as quickly as it appeared returning to brilliantly blue, perfectly cloudless skies and 30+ temperatures by midday, and remaining like that for the rest of the week. For those Brits who were disappointed with the lack of summer this year then Tuscany provided a stark but welcome contrast.

The conference was organised by Stefano Turillazzi and the Italian section of the IUSSI, who all did a great job throughout the entire week. That's not to say that there weren't any hiccups, one highlight which we won't soon forget happened during the opening cocktails. This started as a civilised soiree with delicious Italian wine and decent eating on offer, when curiously the main doors were locked shut and police tape was wrapped around the outside of the building… apparently we should have pressed on by this point because when the doors eventually did fling open, an assemblage of young ladies in skin-tight leotards came parading through and were probably quite taken aback to find a hall full of dishevelled looking academics blinking back at them. Turns out we'd booked the same hall as the Miss Italy competition for that evening and luckily the parade was not an overly lavish siphoning off of funds from the fairly hefty conference fee.

The rest of the week transitioned much more smoothly with four days of talks. Each day began with an hour long plenary followed by two series of smaller talks that ran concurrently. This set up worked well as there was always at least one talk running that was likely to interest most of the people there, and the themes of each set of talks were different enough that clashes between two desirable talks were very rare (for me at least). There were also a couple of poster sessions that each housed plenty of students so that nearly everyone at the conference got to present or talk about something. This made for plenty of fascinating discussion in the hotel, the bar and beyond. As can be expected in such a lovely part of the continent the catering was excellent, with delicious three course pasta and meat dishes and generous helpings of wine provided every meal (with handy helpers ready to surreptitiously replace any empty bottles before anyone could realise how much they had already had), for me there was the ever-present temptation to overindulge, but of course not enough to detract from the science on offer.

Of the talks themselves the plenaries, as should be expected, were mostly excellent. For me, the highlight was Serian Sumner's talk on the state of the exciting field of social genomics. She aptly summed up some of the progress in the field, reported on some important findings and was very clever in maintaining constant reference to Nico Tinbergen's four questions approach which is fantastic to see these days. I felt that her talk was effective; though I can't help but think that social genomics is still a field in its infancy. There is still a clear bias towards protein-coding expression changes over non-coding regulatory and epigenetic processes, and towards honeybees over other social insects, a fact that Serian herself was quick to acknowledge when questioned. Excellent plenaries also came from Sylvia Cremer who described some simple but really interesting and effective experiments on ant societies' collective responses to diseases, and Madeleine Beekman who described the interesting contrasts in decision making behaviour between dwarf honeybees and European honeybees during swarming and making it clear how such questions are relevant to wider decision making processes across such diverse fields as computing, law and economics. Of the short talks I would like to give Ben Oldroyd a special mention, his fascinating talk on paternal imprinting and sexual conflict in social hymenopterans opened my eyes up to an entirely new area of biology which I had given little consideration to before.

The conference was ended with an absolutely wonderful five course meal, and to continue the theme there was still plenty of excellent wine being bandied about. Thus this year's IUSSI European meeting was a maelstrom of good wine, delicious food and exciting cutting-edge

science, exactly what one might have expected from a week away with a gang of social insect researchers in Italy.

David Collins (UEA)

I was lucky enough to be able to attend the 5th European congress of the IUSSI in Montecatini Terme, Italy from 26th-30th of August 2012. This was made possible thanks to funding from the Pamela Salter Charitable Trust; the Company of Biologists, the Richard Warn Fund and the North West European section of the IUSSI. The Tuscan hills provided a scenic backdrop to the conference and the town, Montecatini Terme, proved a lively centre in which to set it. I was particularly impressed with the Romanesque bath house which hosted the welcome reception and gave a good opportunity both to reconvene with old friends and meet new ones in a relaxed setting. The food was, of course, also impressive and this set a precedent for the remainder of the week, culminating in a feast of truly epic proportions on the Wednesday night. The conference itself was organised into a plenary each morning, a series of dual symposia and two poster sessions. The plenary lectures provided excellent summaries of a whole range of developments in their various sub-fields and I was particularly impressed with Serian Sumner's clear commandeering of the Tinburgen framework which divides questions into the proximate and the ultimate. I find the distinction all too often ignored or misunderstood and this is the cause of much unnecessary conflict and disagreement in a field (social insect biology) which actively explores and integrates the study of both selection and mechanism. The quality of the talks in the symposia was very high, and I don't think I observed any snoozing, which is quite a remarkable feat for a week-long conference and testament to their novelty. My personal favourite symposia were 'Genes, genomes and social behaviour' and 'Social behaviour and collective processes in social insects'. The former of these integrated novel techniques and understanding in genomics and gene expression with sex determination, caste determination, aging and phylogenetics. The latter symposium included a refinement of our understanding of emergent properties in social insects such as foraging, division of labour and synchronisation of reproduction, as well as a deeper insight into individual behaviours such as social learning in bumblebees and vibration sensing in termites. I myself presented a poster this year, and was amazed at the attendance at both of the sessions. Many presenters manned their poster for well over an hour and the response to some of them was incredible. A special treat was the airing of Christian Peeters's film on ants which was aimed at the general public and especially a younger audience. On top of the hard work that was obviously put into the animations, I admired the way that the film retained some of the more technical terminology, because I don't see why children shouldn't be able to acquire and utilise a subset of scientific language at a young age (instead of learning what is essentially a new language when they get older!). As well as my funders (named above) and the presenters, I am grateful to the conference organisers for orchestrating the events in a manner that even the largest ant colonies would be jealous of.
Jacob Holland (UEA)

As my PhD hand-in fast approaches, the idea of getting to as many conferences as possible this summer was essential in order to not just be inspired by the current frontiers of research but to meet with scientists with similar interests to me. This, of course, placed my attendance to the IUSSI's European meet in Italy to the top of my list of things to do!

Along came September and unsurprisingly I was not disappointed! Not only was there a plethora of we3ll-known names from across Europe and beyond but there was also a large body of new PhD and Masters students all desperate to show their research off or discuss what they intended to do over the coming year (Weather permitting!).

There was of course many interesting talks to see, and unavoidably I suppose, I had to choose between parallel talks on many occasions but with plenty of breaks there was plenty of opportunity to catch up with things is had to miss. One such break was the poster sessions which can be odd occasions but with such a diversity of posters the display rooms were soon filled with bodies and perspiration as polite scrums ensued around each poster.

One talk of particular note was the plenary talk of Sylvia Cremer who showed superbly how ants use formic acid in social defence against pathogens, which adds further weight to the

view that the Metapleural gland is not the lynchpin of an ant's prophylactic immunity as was once thought.

Altogether the conference was a great experience, and that's not just because of the wonderful talks, interesting posters, surprising ant cartoons, stunning Miss Italy candidates or local pizza. It was mostly down to a great collection of brilliant, enthusiastic IUSSI members, all there to enjoy their work and company.

Peter Graystock (Leeds)

The European IUSSI conference was held this year in Montecatini Terme in Tuscany. The event began with the opening ceremony in the beautiful surroundings of Terme Tetuccio. Each morning a plenary lecture was given which ranged in subject from disease defences in ants (S. Cremer) to the use of Apis spp. nest-site selection as a concept in optimization algorithms (M. Beekman).
I am predominantly interested parasitology and studying the current threats which honey bee populations are faced with today. I found the session on Basic Research on Honey bees and Applicative Outputs to be the most relevant to my work. In addition, the sessions on Biodiversity, Community Ecology, Invasion Biology and Impact on Human Affairs also, Genes, Genomes and Social Behaviour and Diseases, Immunity, Symbionts and Social Parasites were of particular interest. The opportunity to present my work was an invaluable experience and I received very useful feedback and enquiries.
As a PhD student in the early stage of my career, I found attending this event very useful as I was able to see how my own work fits in to the current and much broader field of social insect ecology and evolution.

Kirsten Foley (Leeds)

I approached the 5$^{th}$ congress of the European Sections of the IUSSI with excitement as this was the largest conference I had so far attended, and I was looking forward to learning about the most up to date research being carried out by colleagues around Europe. Being particularly interested in the mechanisms underlying caste determination, the highlight of the conference for me was the session in which I presented my research; Genes, genomes and social behaviour. I was particularly struck by the wealth of talks using gene expression analysis and genomic methodologies to look at the underlying mechanisms of caste differentiation. This theme was introduced by a very interesting plenary talk given by Seirian Sumner, "Towards an integrated understanding of social behaviour", discussing how the integration of traditional behavioural approaches with genomics can enhance our understanding of social behaviour. Seirian introduced an impressive body of research focusing on the Polistes paper wasp, which showed how this integrative approach can reveal new insights into social behaviour and evolution. What followed was a fascinating session with talks covering topics ranging from the importance of inclusive fitness theory, to comparative genomics and epigenetics, to the evolution of life-span and ageing, and I left the session with fresh ideas and renewed inspiration. Overall, the conference was a real success, combining excellent organisation, a wonderful location, an interesting and varied range of talks, and a delicious conference dinner!
Rowena Mitchell (Leeds)

The 5th European IUSSI meeting was a truly exciting conference. The congress gathered over 400 researchers from all over Europe each with a specific background and resulted in an impressive display of science with contributions from more than 400 researchers. The organising committee really did wonders to ensure that each day run smoothly, with the help of a bell that certainly will be remembered in the future editions.
The committee also picked a very nice location for the conference, within walking distance from the train station and Montecatini's town centre and main attractions. With the amazing thermal resort as a backdrop, Stefano Turillazzi directed the opening ceremony and welcomed everyone on the evening of Sunday. It is hard to imagine a better way to get the conference started, with delicious food on a warm summer evening and colleagues to meet, to greet and to speak to.

The actual conference started with a plenary lecture by Serian Sumner underlying how new genomic technologies when combined with the more conventional behavioural studies, can lead to a better understanding the social behaviour. She presented a study of sociogenomics conduced on

Iussi 2012 in Tuscany marked also my very first experience at giving an international presentation. My talk was scheduled on the last day, which meant that my talk was after both the social dinner and a majority of talks. Both proved to be very enjoyable in very different ways.
So, in conclusion, this was an excellent conference that ticked all boxes and really left many good memories and inspiration. Congratulations to the organisers, all the speakers and everyone in attendance for turning it into a successful event, and I'm already looking forward to the next one, IUSSI 2014 in Perth!
Gianluigi Bigio (Sussex)

I enjoyed all the talks in European sections IUSSI 2012 as they were very well organized and presented. Especially the first plenary given by Seirian Sumner was enjoyable as she was so enthusiastic and had done interesting research. She had looked at molecular basis of caste differentiation in *P. canadensis* and found an asymmetry in caste-biased expression so that more genes are upregulated in workers than in queens. To what extent these are unique to workers remains to be seen as no males were used in comparison and from my own experience some genes seem to be expressed in males and workers but not in queens. Sumner's use of genomics tools to answer real biological questions was what I think it all should be about. Not to go crazy just because of omics. Another interesting talk was given by Inti Pedroso, who had looked at gene duplications along evolutionary timescale. The importance of gene duplications in organismal evolution has been acknowledged for a long time but not before genome sequencing started to be routinely performed could copy number variation between and within species be studied. Pedroso's work showed that lots of genes were duplicated and new genes were born at the time when eukaryotes evolved. Concentrating on Hymenoptera, his work suggests that Hymenoptera have acquired new genes to perform functions related to nervous system and body plan development. In conclusion, new genes originate at times of morphology innovations. This suggests that gene duplications are adaptive and not a random birth-and-death process advocated among others by M. Lynch. Interesting extension to Pedroso's work would be to see what genes are then lost at different phases of evolution. Sylvia Cremer's plenary was just beautiful with her modest style and brilliant research. Of special interest to me was Morgan Pearcy's talk about recent progress with the clonally reproducing longhorn crazy ant. Suprisingly, all the populations around the world he has sampled are clonal and have the same origin. Thus they give no clue where the clonal reproduction might have originated but show that single lineage has been successful global invader. All and all the conference was enlightening and as I will be soon applying for post doc, it was good to talk to people and start to develop some ideas for possible projects.
Jonna Kulmuni (Oulu)

The 5th congress of IUSSI European sections was organized in Italy, in beautiful Montecatini Terme. The conference began on Sunday evening with opening ceremony in Terme Tettucio. The president of Italian section Stefano Turillazzi opened the event with warm welcomes. After the opening words we could enjoy the beautiful piano playing while eating delicious Italian antipastos. Scientific atmosphere was already sizzling and it was obvious that members from different sections were so glad to meet each other and catch up the latest news.

The 1st day started with Serian Sumner's plenary lecture "Towards an integrated understanding of social behaviour". I was fascinated by her talk; it was interesting and innovative and she really could take her audience. It really was a perfect beginning for the conference. I spend my first day listening speeches at "genes, genomes and social behavior" session. After this session you could really see that next-generation sequencing is today's hot topic in genetic research. We are so lucky that obtaining data from transcriptomes and genomes is now possible for smaller groups too!

In the evening we had our first poster session in which I presented my poster too. I had some interesting talks about my research plans and it was nice to see that people really think my plans are interesting. It was nice to see that people are getting more and more creative with their posters. You could see a lot of different colors and designs and it really helps posters to stand out from the crowd.

The second day for me was all about “diseases, immunity, symbionts and parasites”. My own study project is concentrating on immune genes in Argentine ants so this was the session I had been waiting for. There were many talks about social immunity in ants and this broadened my perspective on this topic. I was happy to see that immunity in social insects was one of the most popular topics in this conference, so with my topic I am not definitely alone.

The third and the fourth day were something new for me. I was not very familiar with behavioral studies in social insects. Now I had a possibility to get this very intensive package about the topic. It was also good to hear speeches about other social insects than ants, now I can say that I know a few things about bees and wasps too. The second poster session on Wednesday was more behavioral research oriented so for me it was interesting to go around from poster to poster and learn a new bit of information from every poster!

All in all, I think that the conference was a success at least for me. It really broadened my view about the research of social insects. I met new people who share same interests than I do. It was motivating to see that so many people share a passion towards this topic. I am already waiting for IUSSI meetings in the future.

I really want to thank people who organized this lovely meeting. It was so obvious that they had spent a lot of time and effort to make everything work. I also want to address my thanks to the North-west European section for awarding me with the grant for this meeting.

Jenni Paviala (Helsinki)

# IUSSI Northwest European Section
# Winter Meeting

## Monday 10th December

**Registration & introduction**

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| 9.30am | Coffee and registration |
| 10.00am | Introduction |

**Plenary**

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| 10.10 am | **Ashleigh Griffin** (University of Oxford)<br>Social evolution in bacteria |
| 10.55 am | **Coffee** |

**Session 1**

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|---|---|
| 11.10 am | **Rob Hammond** (University of Leicester)<br>Devil's Work for Idle Tarsi? Selfish Reproduction vs Working |
| 11.30 am | **Stephanie Dreier** (Institute of Zoology)<br>Helpers' provisioning rules and the maintenance of group stability in a primitively eusocial wasp |
| 11.50 am | **Dóra Huszár** (University of Copenhagen)<br>Revealing the supercolony syndrome in the common red ant *(Myrmica rubra)* |
| 12.10 pm | **Erika Dawson** (Queen Mary's)<br>Bees use social information as an indicator of safety in dangerous environments |

**Business meeting & lunch break**

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| 12.30pm | Lunch (provided) |
| 1.30pm | IUSSI business meeting |

**Session 2**

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|---|---|
| 2.00 pm | **Claire Carvell** (CEH)<br>Insights from genetics into the fine-scale ecology of common and scarce bumblebees |

2.20 pm **Margaret Couvillon** (University of Sussex)
How good is the British countryside for our honey bees? Decoding waggle dances to see where bees forage

2.40 pm **Tom Bishop** (University of Liverpool)
Exploring community structure and function across an elevation gradient: ant assemblages in the Drakensberg Mountains, South Africa

3.00 pm **Ashish Umre** (University of Sussex)
Biologically Inspired Agents in Uncertain Environments

**Coffee and posters (mini presentations)**

3.20 pm Coffee and poster session

**Session 3**

4.20 pm **Yannick Wurm** (Queen Mary's, London)
A Y-like social chromosome causes alternative colony organization in fire ants

4.40 pm **David Collins** (University of East Anglia)
The role of microRNAs in caste determination and differentiation in the eusocial insect *Bombus terrestris*

5.00 pm **Panagiotis Sapountzis** (University of Copenhagen)
Mapping the gut-bacteria of fungus growing ants

5.20 pm Award of prize for the best student talk

5.30 pm End of meeting