



IUSI North-west European section

International Union for the Study of Social Insects

Autumn Newsletter 2015

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Announcements

The IUSSI NW Europe section 2015 Winter Meeting

This year's meeting will be held at Bristol University, and will take place over two consecutive days (17th and 18th December 2015)

For online registration, arrival/departure times, accommodation and travel options, and to submit abstracts for talks or posters, please visit www.iussibristol.weebly.com.

We will also be hosting workshops on the emerging frontiers in social insect biology, hosted by postdocs and early-career researchers, which we hope will culminate in a review/perspective article in *Insectes Sociaux*. To suggest a workshop topic, and/or apply to host one yourself, see the website.

Registration is £30 for students and £45 for non-students.

Please send anything that you'd like to be on the agenda for the section's business meeting to Elli Leadbeater elli.leadbeater@rhul.ac.uk

Call for nominations for Section Officers

The term of office of our current Section Officers will end in December 2015. We thus invite nominations for the role of President, Secretary and Treasurer of our section. Potential candidates should be active members of the IUSSI, with research interests within the remit of our section, who hold a research or permanent academic position within North-West Europe. Please direct any enquiries to Mark Brown (Mark.Brown@rhul.ac.uk), Elli Leadbeater (Elli.Leadbeater@rhul.ac.uk) or Bill Hughes (William.Hughes@sussex.ac.uk). Self-nominations are welcome. Please submit nominations by **Friday 11th December**.

Other upcoming meetings

ASAB winter conference 2015: <http://synergy.st-andrews.ac.uk/solace/asab-winter-conference-2015/>. This year's theme is "Social Learning and Culture". The conference will take place on December 3rd-4th at the Zoological Society of London's meeting rooms in Regent's Park, London.

European IUSSI Congress: Hosted by Professor Lotta Sundström on behalf of the North-west European Section, the conference is planned to take place from the 8th August (arrival and registration) to the 11th August 2016.

Lab updates

University of Bristol: Sumner group

Like nomadic army ants scuttling across Bristol, **Seirian Sumner's** lab has migrated to a swish new building, where we are looking forward to hosting the upcoming Winter Meeting. We were sorry to bid farewell to postdoc and bumblebee-extraordinaire **Peter Graystock**, who

has left on a nuptial flight to the University of California, Riverside. Postdoc **Daisy Taylor**, however, has metamorphosed from marine biologist to wasp-hunter, having just returned from several months in Trinidad kicking off a globe-spanning project into the origins of castes at the dawn of eusociality. Final-year PhD student **Emily Bell** has learnt new bioinformatics skills to analyse her datasets on caste plasticity, and is now busily writing up. **Robin Southon** has spent a busy second field season in Trinidad on the trail of cryptic social behaviours amongst male wasps, with the help of undergraduates **Sam Morris** (soon to join the group for his masters) and **Liam Crowley** (soon heading off for his masters at Harper Adams). **Adam Devenish** has careered around the world, from South Africa to Spain to Kew Gardens and back to Spain again, in pursuit of nefarious invasive ants and their consequences for seed dispersal. First-year PhD student **Patrick Kennedy** and veteran *Polistes* stalker **Thibault Lengronne** spent several months in French Guiana radio-tracking wasps and unwittingly feeding tiger mosquitoes. Funded by the SWDTP, first-year PhD student **Sam Duckerin** has explored everything from the mysteries of bumblebee social networks to electric field detection by pollinators to the optimum design of miniature hostels for his lab colonies.

Meanwhile, summer student **Emma Eastcott** has worked hard in the lab to uncover the population structure of the Guiana population, with funding from the Genetics Society. **Pierre Thomas** joined us over the summer to get to grips with bioinformatics. Brazilian student **Felipe Pereira Da Rocha** has leant his thorough eye to identifying species of South African ants. Coming up, we're excited to welcome new PhD student **Sandra Moreno** from Mexico to work on the genomic mysteries of hover wasps.

Last but not least: in a previous announcement here in 2008, we said that "Seirian is busy gestating". We're delighted to announce that her family worker:brood ratio will once again fall, from 1:1 to 2:3 before Christmas.

University of Copenhagen

"Major transitions" could be suitable as a title for this phase at CSE, with many old members leaving and new joining. Adding the several exciting meetings and conferences attended by a number of CSE members, it has been very vibrant around here lately!

We start with a big congratulation to Guojie Zhang who began a formal tenure track position on the 1st of January 2015 in Functional Genomics. Guojie also continues his external affiliation with BGI, China. Guojie is not new at the CSE but now he is even closer. Also not new to CSE, we welcomed back Line Vej Ugelvig, who began her postdoctoral grant from the Danish Council for Independent Research on focusing on social immunity in ants. The Council additionally awarded her a **Sapere Aude: DFF-Research Talent grant**, and she received a L'Oréal-UNESCO for Women in Science award. Welcome on board to both.

We said good bye to a long-term CSEer, Susanne den Boer, after 12 years at CSE to start her new job as a research advisor at the Faculty of Health and Medical Sciences, University of Copenhagen. Also to Pepijn Kooij who started a postdoc at the Royal Botanic Gardens, Kew, UK, studying comparative fungal biology. To Luigi Pontieri who started a postdoc in Tim Linksvayer lab, University of Pennsylvania, studying pharaoh ant behaviour. To Sămi Schär who was awarded funding from Switzerland to study ant taxonomy in Spain, a bit of a warmer weather choice! And Rachelle Adams will start a tenure track assistant professorship at The Ohio State University- Department of Evolution, Ecology, and Organismal Biology in January 2016. From the entire CSE, we are delighted to hear that all turned well with you, and we look forward to hearing about your next exciting achievements.

As you say good bye, you say welcome as well at the CSE. Haofu Hu just arrived to start his PhD with Michael Poulsen's ever growing termite group, and Kristine Pedersen also joined the fungus-growing termite group to begin her master thesis on termite diet and behaviour. Winnie Nielsen joined CSE postdoc Jon Shik to begin her master thesis on ant behaviours. Mette Hansen joined David Nash's group and started her master thesis on *Myrmica rubra* microgynes. Finally, Sarah Tolly, University of California, began her NSF GROW fellowship at CSE with Panos and Mariya to work on ant *Wolbachia*. More CSE members, more cake! Welcome to all.

Defence list starts with Ben Conlon and Jane de Verges from fungus-growing termite group. They successfully defended their master theses. On the run, Jack Howe has just submitted his MSc thesis and will be defending while this newsletter is in print. Congratulations.

Finally, the CSE summer was full of activities. Conferences attended in France, China, USA and ESEB in Switzerland with 15 CSE members presenting. Not to forget fieldwork in Estonia, Siberia, Bornholm and Læsø by several groups at the CSE. More conferences and field trips are planned for the winter, stay tuned.

University of East Anglia - Andrew Bourke's group

Over the past year, the group has seen a new set of departures and arrivals. Congratulations to **Henry Ferguson-Gow** and **David Collins**, who following their successful vivas were awarded their PhDs. Henry's thesis was on the evolution of social traits and biodiversity in ants and was supervised collaboratively with Kate Jones at UCL and Seirian Sumner at the University of Bristol.

Henry now has a postdoctoral position with Andrew Meade at the University of Reading conducting research on phylogenetic methods. David's thesis was on the role of small RNAs in caste determination and differentiation in the bumble bee, *Bombus terrestris*, and was supervised collaboratively with Andrew's UEA colleague, Tamas Dalmay. David has remained with us and has been extending the work started in his PhD in a BBSRC-funded project on the molecular basis of caste differentiation in bumble bees (also collaborative between Andrew and Tamas Dalmay).

We welcomed two new people to the group, **Marjorie Labédan** and **Anders Wirén**. Marjorie joined us from Université Paris Nord 13, and is a Research Technician working with David Collins and Anders on the caste differentiation project. Anders joined us as a postdoctoral bioinformatician from the Swedish University of Agricultural Sciences and, as well as working with David Collins and Marjorie on their project, is working with **David Prince** and **Tim Huggins** on a NERC-funded project investigating genetic aspects of worker reproduction in *B. terrestris* (again collaborative between Andrew and Tamas Dalmay).

Worker reproduction is also a focus for **Pierre Blacher**, who will shortly enter the second year of his fellowship from the Fyssen Foundation, in which he is investigating the association between worker reproduction and longevity in *B. terrestris*. Meanwhile, **Liam Crowther** has been conducting the second year of his NERC-funded PhD project, which is on *B. hypnorum* ecology (collaboratively with CASE partner Claire Carvell at the Centre for Ecology and Hydrology, Wallingford). We were pleased to see the second paper from the PhD work of former group member Jacob Holland (now in Guy Bloch's group at the Hebrew University of Jerusalem) published in *Functional Ecology*. A new paper from Andrew's collaborative Insect Pollinators Initiative project was recently accepted in *Ecological*

Applications, the first author being John Redhead at CEH and coauthors including Seirian Sumner, Stephanie Dreier and our other collaborators Matt Heard and Claire Carvell (lead PI) at CEH and Jinliang Wang at the Institute of Zoology. Finally, Andrew, David Collins, Tamas Dalmay and UEA colleague Matt Beckers were all pleased to contribute to the multi-author *Bombus* genomes paper (Sadd et al. 2015) that came out in *Genome Biology* earlier this year.

Imperial College London- Richard Gill's lab

It has taken persistence and the group has endured but our lab, mesocosm and field setups at Silwood Park are now well in place and so some cool bee research is continuing to be done! After his first postdoc year Andres Arce has survived his intensive field work, developed an exciting collaboration with the Wurm group at QMUL on genomic methods, submitted his first paper with the group on the effect of pesticides on bumblebees, and has now started his demanding mesocosm experiments - he's such a slacker ;0p. Dylan Smith is through his first PhD year and is in the process of publishing his first paper, has also built a collaboration with the Bompfrey lab at RVC and is now diligently going through his results of a nice experiment linking bee brain morphology with behaviour. A big congrats goes out to Leonie Gough who passed her Masters year with a distinction, and who will now join the group as a PhD student and use her experience in land-use change modelling to look at hazards to biodiversity.

We will sadly have to say goodbye to Ilaria Prettelli, who will soon be returning to Italy after working in the group for the past 6 months. Ilaria has done some nice work on bee flight performance, and she will be very missed by the group. Another congrats goes to the students Jiajun (Stanley) Yu who looked at bee foraging choice behaviour and gained a distinction, Sarah Gougeon who looked at pollen foraging performance and gained a merit, and Katie Taylor for looking at bee diversity on field margins (in collaboration with GCWT, UK) and gained a merit for each of their Master's thesis. Furthermore, whilst not currently set-in-stone, we hope that in a few months Jacob Johansson will be joining Silwood Park as a fellow and hosted as a collaborative partner with our group on evolutionary and community theory of bees after successfully being awarded a Marie Skłodowska Curie International Career Grant.

Rich Gill obviously loves juggling the demands of teaching and administrative duties alongside his research, and as a consequence has developed the memory of a goldfish. He apologises to his group for forgetting his meetings, but is very grateful to Ana Ramos-Rodrigues for reminding him and most of all for tirelessly helping with the group's experiments. Rich will be co-chairing alongside Elli Leadbeater a symposium at the IUSSI 2016 meeting in Helsinki titled: *effect of environmental stressors on behaviour and colony function*; we really encourage anyone with an interest in this theme to submit presentation abstracts once the invitation is released. After organising a BBSRC and NERC funded workshop in connection with the UK's national pollinator strategy, Rich is also in the final processes of publishing a large review / perspective paper on the importance of studying wild pollinators (which includes a lot on solitary and social bees) in the journal series *Advances in Ecological Research* and co-authored by some of our other IUSSI members, so please do watch-this-space.

University of Helsinki: TEAM::ANTZZ

The fourth year of TEAM::ANTZZ as part of the Centre of Excellence in Biological Interactions (CoE) has been full of exciting research that has kept everybody busy! First of all, our undergraduates Taina Stark (supervised by Heli Salmela) and Katri Ketola (supervised by

Jonna Kulmuni) have finished their MSc thesis! Also Anna Hietala (supervised by Claire Morandin and Heikki Helanterä) is almost finished with her work. Ella Laakkonen, a new addition to the team, started her masters' project on aging and immunity in ants under the guidance of Nick Bos. We were also very delighted to have the help of five field assistants this year: Anni Nousiainen, Sara Goncalves, Matti Leponiemi, Johanna Lindholm, and Julius Mäkinen.

Our group is happy to declare two new graduations this year! Both Eva Schultner and Claire Morandin defended their theses successfully! Claire will continue working in the CoE as a post-doc. PhD-students Jana Wolf, Dimitri Stucki, and Martina Ozan are all working hard to finish their thesis during next spring. PhD student Stafva Lindström is making sense of large amounts of data on ant nest fungal communities and PhD student Kishor Dhaygude (both supervised by Helena Johansson), is completing the *F. exsecta* genome assembly and contemplating consequences of microbial interactions. Unni Pulliainen and Siiri Fuchs, who secured a 4 year fellowship for her PhD-studies and continues to work under supervision of Dalial Freitak with parasite resistance, spent a long and productive field season at the Tvärminne Zoological station along with Sanja Hakala, who returned from maternity leave.

Our post doc Dalial Freitak has returned from Jyväskylä to Helsinki. She has been busy with the press commenting on their finding about the novel mechanism behind trans-generational immune priming in insects, which has important implications for honey bee vaccination. Nick Bos has likewise been busy dealing with the press after publishing a paper on self-medication in ants with Dalial, Siiri, and Lotta. We are happy to announce, that Nick received a 3-year grant for a post-doctoral fellowship from the Academy of Finland to study healthcare in social insects! Helena Johansson has returned from her maternity leave and has started new population genomic projects. To keep a baby balance, Heli Salmela left for maternity leave to enjoy the time with her baby daughter. Jonna Kulmuni started her HFSP fellowship in January and is currently in Sheffield, working with Roger Butlin and studying speciation in mound-building wood ants. Sarah Matthey finished her post-doc in CoE and is now back in the UK.

Perttu Seppä continues his efforts educating students to the secrets of population genetics and studying conservation genetics of *Myrmica* and *Formica* ants. Heikki Helanterä received a grant from KONE foundation to study superorganisms and evolutionary transitions. Lotta Sundström has been very busy with supervising, being a co-director of the CoE and director of the graduate school in ecology and evolution as well as the vice dean of the Faculty of Biological and Environmental Sciences. Despite these duties, she still continues to work as a field assistant during the summer months, i.e. boat driver and ant colony sampler, in Tvärminne.

Queen Mary University of London (and Rothamsted Research)

Bumblebees disregard floral colour cues on vertically arranged flowers



We find that bumblebees are excellent at remembering the colors and patterns of flowers that provide them with nectar rewards, when flower signals are arranged in a meadow-like, horizontal display. However when the same types of flowers are arranged vertically, such as bees might naturally encounter on trees, they abandon their keen discrimination abilities, and visit flowers at random. We suggest that this poor discrimination reflects a foraging strategy fine-tuned to the ecological context.

WOLF S, ROPER M & CHITTKA L (2015) Bumblebees utilize floral cues differently on vertically and horizontally arranged flowers. *Behavioural Ecology* 26(3), 773-781.

Clever boys – Assessing the cognitive abilities of male vs. worker bumblebees



We explore how the different sex-specific behavioural requirements of bumblebee males and workers affect their learning abilities. Both workers and males actively forage on flowers but the males have to trade-off their foraging with mate search. In a serial colour learning task we compared the sexes' ability to flexibly learn visual floral cues with reward in a recurrently changing foraging scenario. We show that behavioural sex-dimorphism in bumblebees did not affect their cognitive abilities beyond the mating context. In both sexes the characteristics of the foraging performance depended largely on the colour difference of the two presented feeder types. This has important implications for pollination ecology and qualifies stingless male bumblebees as an advantageous alternative model system for the study of pollinator cognition.

WOLF S & CHITTKA L (2015) Male bumblebees (*Bombus terrestris*) perform equally well as workers in a serial colour learning task. *Animal Behaviour*. In press

Activity patterns in insects are governed by innate statistical laws



Animal activity patterns often appear to be haphazard, idiosyncratic and apparently unpredictable. In spite of the multitude of social and environmental interactions affecting our decision-making sporadic and seemingly random flurries of activity in humans can be described by robust statistical laws. Even the letter correspondence patterns of great minds like Einstein and Darwin conform to this law. We found that same statistical law also characterise bursts of activity in insects, including honeybees, when deprived of environmental cues to behaviourally respond to. These activity patterns are likely guided by decision-making circuitry idling deep within the animal's brain.

REYNOLDS AM, JONES H, HILL JK, PEARSON A, WILSON K, WOLF S, LIM KS, REYNOLDS DR & CHAPMAN JW (2015) A universal 'idling-mode' activity template in flying and pedestrian insects. *Royal Society Open Science* 2:150085

Royal Holloway University of London- Mark Brown's lab

As ever, it's been a busy and exciting year. Apart from the normal teaching and admin, Mark (Brown) has been busy setting up a new field course on the Greek island of Samos, which (coincidentally...) has some lovely ants and wasps. He also managed to spend time in the summer in Vancouver, for an OECD Symposium on Microsporidia, Lausanne, for the ESEB meeting [an excellent conference, with many (but not enough!) social insect researchers. Swimming in a bath-tub temperature Lake Geneva was also a highlight!] and Zürich, for Paul and Regula Schmid-Hempel's celebration (a wonderful party – Paul and Regula formally retire next year, although we know they'll carry on in science, which is good news for us all). Fabio (Manfredini) is enjoying his Marie Curie fellowship, and spent an exciting summer in the US, where he learned to apply RNAi to paper wasps, as well as touring some of the many incredible national parks. Gemma (Baron) successfully defended her PhD in May, and we gave her a fond farewell before she left us to take up her first new job, working with Nikki

Gammans on the short-haired bumblebee reintroduction project in Kent. Callum (Martin), Dylan (Hodgkiss), and Sarah (Walkington) have all had busy summers working on parasite-impacted pollination, hoverfly pest control and pollination, and bumblebee microbiome projects, respectively, and we look forward to seeing exciting data from them at the winter meeting in Bristol!

In the past month, Hauke (Koch) has joined us as a post-doc through a collaborative project with Phil Stevenson at Kew, looking at the impact of phytochemicals on bee health, and Arran Folly is joining this project as a PhD student. A new MSc student, Zoe Munday, will start with us, on projects as yet to be decided, in October. And, in the autumn we'll be employing a 3-year post-doc and a 3-year research technician, to start in January 2016, so watch out for the ads!

Looking forward to seeing you all in Bristol!

Royal Holloway University of London- Elli Leadbeater's lab

Elli returned to work at the end of September after 11 months of maternity leave, and will be starting a large new honeybee project in February 2016, so please watch this space if you are a PhD student looking to start a postdoc next year! We will be recruiting for two PDRAs, one of which will focus on the genomics of honeybee communication, whilst the second will specialize in social network analysis. Full details will be advertised shortly on jobs.ac.uk and updates will be posted on [https://pure.royalholloway.ac.uk/portal/en/persons/elli-leadbeater\(a2edc845-5d79-4c83-bab4-6c58102f485f\).html](https://pure.royalholloway.ac.uk/portal/en/persons/elli-leadbeater(a2edc845-5d79-4c83-bab4-6c58102f485f).html). Please direct any informal enquiries to Elli.Leadbeater@rhul.ac.uk

In the meantime, Liz Samuelson has been holding the fort admirably. She has recently completed her MRes thesis on spatial learning in bumblebees, and spent the summer collecting the first field data for her PhD on the effects of urbanization on honeybee colonies. Liz is co-supervised by Richard Gill (Imperial College). Elli and Rich will also be organizing a symposium at the upcoming IUSSI meeting in Helsinki this summer, entitled "Effect of environmental stressors on behaviour and colony function" so please keep an eye on the conference website if you're interested in submitting an abstract.

University of Sussex- Bill Hughes' lab

Chris Tranter has recently submitted his thesis on disease resistance in ants, and will be defending in November. **Victoria Norman** is now into the fourth and final year of her PhD studying caste and task determination in leaf-cutting ants, and **David Treanor** is entering the 3rd year of his PhD investigating the effects of *Wolbachia* and other symbionts on social insects. **Julia Jones** is continuing to investigate the metagenomics of honeybees, sweat bees and dinosaur ants on a Marie Curie Fellowship, and **Tobias Pamminger** is also midway through his Marie Curie Fellowship investigating the reproductive ground-plan hypothesis in ants, as well as a myriad of other things. Julia, Chris, Victoria and Bill visited Brazil earlier in the year to dig up dinosaurs. With 2 m deep nests, this turned out to be quite challenging, but we were ultimately successful, thanks largely to the employment of some tireless Brazilian labourers whose digging abilities put even the most hardened diggers amongst us to shame. In further ant collecting news, Tobias and David have made another trip to Romania for the rather easier to collect *Temnothorax*, Tobias had a small legion of helpers wandering the streets of Brighton collecting *Lasius* queens after their mating flight, and David has been digging up half of the Sussex campus to collect *Myrmica*. We've welcomed **Tatiana Sales**, a PhD student from Brazil, who is currently visiting us on a six month

placement studying the representation of colonies in *Acromyrmex* nuptial flights. We also have three new social insect PhD students who have started with us this September. **Marta Rossi** will be working on the blood-brain-barrier in ants, bees and other insects, combining neurobiology with comparative analysis. **Joanne Carnell** and **Rosaline Hulse** will both be investigating the effects of diet and stress on the susceptibility of bumblebees to disease, with Joanne coming at it from an ecological angle and Rosaline from the perspective of commercial bumblebee production.

University of York: The Robinson lab

The ant research group in York has celebrated two successful PhD completions recently. We said goodbye to **Yi-Huei Chen**, who completed his PhD thesis on the application of Bergmann's rule to social insects across elevational gradients. He has now moved back to Taiwan. **Sam Ellis** has also completed his PhD thesis on the organisation of polydomous wood ant colonies, but is still with us in York, finishing off various papers. The ant group hosted **Courtney Rockenbach** from Simon Garnier's group over the summer working on trail traffic in polydomous systems. **Duncan Procter** is currently writing up his PhD thesis, which covers the effect of forest cover change on populations of *Formica lugubris*, habitat preferences of *F. lugubris*, the fine scale relatedness of polydomous colonies and landscape level population genetics of polydomous populations. PhD student **Phillip Buckham-Bonnett** has survived his first field season working on *Lasius neglectus* in the UK, and is currently enjoying his CASE placement with Hymettus Ltd, visiting ant conservation projects in southern Britain. **Elva Robinson** is in the final stages of editing a book on Wood Ant Ecology and Conservation and enjoyed a trip to Arizona over the summer as an instructor on Brian Fisher's Ant Course.

IUSSI (North-west European Section)

Section website: <http://www.iussi.org/NWEurope>

Membership 2015

1. Please complete your name and contact details:

Title and name

Address

E-mail address

2a. Please tick box if you are a new member

2b. Please tick box if your contact details have changed since last year

Membership fees for 2015 – due by 1 st March	
Ordinary Member	Student Member
£ 15.00 <input type="checkbox"/>	£ 7.50 <input type="checkbox"/>

Payment: Members with a UK bank account are strongly encouraged to pay by standing order; members not wishing to do this should preferably pay by bank transfer, although cheques will still be accepted. Members without a UK bank account should pay by bank transfer or Paypal, ensuring that their payment also covers bank or Paypal fees. All members should include their name as description/reference in their payment.

Bank transfers should be made to:

Account name: Northwest European section IUSSI

Account number: 16100247

Sort code: 602462

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Bank Address: NatWest, Main Street, Heslington, York YO10 5ZB

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Please email completed form to william.hughes@sussex.ac.uk or post with a cheque to Prof. W Hughes, School of Life Sciences, University of Sussex, Falmer, Brighton, BN1 9QG.

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