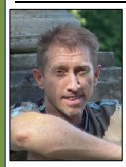
Who's who by Pedro Rodrigues

CHRISTIAN PEETERS



LABORATOIRE ECOLOGIE ET EVOLUTION
UNIVERSITE PIERRE ET MARIE CURIE (PARIS, FRANCE)

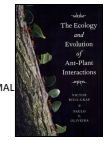
Behavioral ecologist, dedicated mainly to queen morphology and reproductive conflicts in ants, specially in the subfamily Ponerinae.

Interesting Results: (1) Control over reproduction in *Diacamma* involves mutilation of an exocrine gland (gemmae); (2) In queenless ants, reproductive status is signaled by changes in the cuticular hydrocarbons profile; (3) defined and (4) synthesized most of the current knowledge on the variety and evolution of queen morphology of ants

References: (1) *Naturwissenschaften 76, 177–180* (1989); (2) *Animal Behavior 68, 1209–1219* (2004); (3) *Insectes Soc. 38, 1–15* (1991); (4) *Annu. Rev. Entomol. 46, 601–30* (2001)

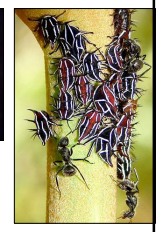
Who's who by Pedro Rodrigues

PAULO S. OLIVEIRA



DEPARTAMENTO DE BIOLOGIA ANIMAL
UNIVERSIDADE ESTADUAL DE CAMPINAS (CAMPINAS, BRAZIL)

Research: has contributed significantly to the understanding of ant-plant interactions and behavioral ecology of ants as well.



Interesting Results: (1) ant-tended treehoppers have increased survival and reproductive output; (2) ant protection results in decrease of herbivory and increase of fruit set (*Opuntia*); (3) Ponerinae ants affect distribution and survival of seedlings of a primarily vertebrate-dispersed plant; (4) magnetic nanoparticles in the head of a ponerine ant are likely to be associated with (5) seasonal migratory patterns.

References: (1) *Oecologia 124: 156-165* (2000); (2) *Functional Ecology 13: 623-631* (1999); (3) *Journal of Ecology 90: 517-528* (2002); (4) *Journal of Experimental Biology 202: 2687-2692* (1999); (5) *Naturwissenschaften 88: 343-346* (2001)

Who's who by Pedro Rodrigues

WARWICK E. KERR

Institute of Genetics and Biochemistry
Federal University of Uberlandia
UBERLANDIA, BRAZIL

Research: has greatly contributed to the genetics of caste and sex determination in social insects. Although retired since 1992, Dr. Kerr (88 years old) still works as a 'volunteer' professor.

Interesting Results: (1) Genetic caste determination in *Melipona*; (2) Importance of weight in division of labor within workers of *Apis mellifera* ; (3) *A. mellifera adansonii* and *A. mellifera lingustica* interbreed in natural conditions; (4) Found that the sound production by bees is key to the understanding of the evolution of communication about food sources in Apidae.

References: (1) *Genetics*, 35: 143-152 (1950); (2) *Evolution*, 18: 267-270 (1964); (3) *Evolution*, 24: 145-148 (1970); (4) *Science*, 3681: 320-321 (1965).

MandyamSrinivasan

Head of Sensory and Visual Neuroscience,
Queensland Brain Institute.
Inaugural Australian Federation Fellow

- **He has spent the past 20 years studying how honey bees detect, chase and intercept moving targets, avoid collisions, and land smoothly every time.**
- **With a background in engineering, including a PhD in engineering and applied science from Yale, US.**
- **While his PhD was officially in engineering, my lab was actually in the medical school and my professor was an ophthalmologist working with butterfly eyes.**
- **Moving to the Australian National University in Canberra in 1978, Srinivasanbuilt a multidisciplinary team that became the focus of national and international.**
- **interested in understanding the principles of visual processing in small animals, such as insects, that possess relatively simple nervous systems but nevertheless display a rich behavioural repertoire.**

By Vishwas

Publications:

Lehrer M., Srinivasan M.V., Zhang S.W. and Horridge G.A. (1988) Motion cues provide the bee's visual world with a third dimension. *Nature (Lond.) 332, 356-357.*
H. Esch, S.W. Zhang, M.V. Srinivasan and J. Tautz (2001) Honeybee dances communicate distances measured by optic flow. *Nature 411, 581-583.*
M. Giurfa, S.W. Zhang, A. Jenett, R. Menzel and M.V. Srinivasan (2001) The concepts of "sameness" and "difference" in an insect. Nature 410, 930-933.
Reinhard, J., Srinivasan, M.V. and Zhang, S.W. (2004) Scent-triggered navigation in honeybees. *Nature (Lond.) 427, 411.*

Who is Who

Prof. Laurent Keller
Professor and Head
Department of Ecology and Evolution
Faculty of Biology and Medicine.

Education
1983 B.Sc. University of Lausanne, Major Biology
1985 M.Sc. University of Lausanne, Major Biology
1989 Ph.D. University of Lausanne, Major Zoology

Research Interest: aging, genomics, kin recognition, sex ratios, cooperation, altruism, and communication. During the last six years he has explored the use of robots as a tool for biological research

Selected Publications:

Matsuura K., Himuro C., Yokoi T., Yamamoto Y., Vargo E.L., Keller L., 2010. Identification of a pheromone regulating caste differentiation in termites. ***PNAS*** 107(29), 12963-12968.

Wang J., Chen P.J., Wang G.J., Keller L., 2010. Chromosome size differences may affect meiosis and genome size. ***Science*** 329(5989), 293.

Schwander T., Keller L., 2008. Genetic compatibility affects queen and worker caste determination. ***Science*** 322(5901), 552.

By Vishwas

Who is who?

Almut Kelber
Professor of Lund Vision group
University of Lund, Sweden

- **Diploma-1989, majors in animal physiology, botany, electronics and psychology. Universities of Mainz and Tübingen.**
- **PhD (1993) at the Biocybernetics Department at the University of Tübingen-- studied flight control and visual orientation in a stingless bee.**
- **In 1998, I joined the Vision Group in Lund where I now work as a Professor of Sensory Biology.**

Research Interests: are general principles of colour vision and have been working on many Different animals including horses, seals, geckos, birds, butterflies, moths and bees. One of my special interests is the threshold of colour vision in dim light.

- **Kelber, A., Balkenius, A. & Warrant, E. J. (2002) Scotopiccolour vision in** nocturnal hawkmoths. *Nature 419, 922 – 925.*
- Somanathan, H., Borges, R. M., Warrant, E. J. and **Kelber, A. (2008). Nocturnal** carpenter bees learn landmark colours in starlight. *Curr. Biol., 18, R996-R997.*

By Vishwas

Ben Oldroyd

Who is Who?

Professor of BehaviouralGenetics
The University of Sydney

Research Interest: behavioural genetics and the evolution of social behaviour in social insects (Asian honeybees and now with Trigona).

He has bred a unique strain of bees in which workers lay eggs with high frequency. These 'anarchistic' bees will provide a superb resource for investigating the mechanisms by which worker sterility is maintained in normal colonies.

Work experience: worked at LaTrobe University (1992-1995), the USDA bee lab in Baton Rouge, Louisiana, (1989-1992), and the Victorian Department of Agriculture (1985-1989).

Reference:

Rinderer, T.E., Stelzer, J.A., **Oldroyd BP**, Buco, S.M. and Rubink, W.L. (1991) Hybridization between European and Africanized honey bees in the neotropical Yucatan peninsula. Science 253: 309-311.

Hughes WOH, **Oldroyd BP**, Beekman M &Ratnieks FLW. (2008) Ancestral monogamy shows kin selection is key to the evolution of eusociality. Science 320:1213-1216.

By Vishwas

Barbara L. Thorne

University of Maryland

Entomology Department, Professor

Ph.D. 1983 Organismic and Evolutionary Biology, Harvard
M.A. 1978 Organismic and Evolutionary Biology, Harvard
B.A. 1976 Biology, Brown

Evolution of eusociality in termites
- -Accelerated Inheritance hypothesis
- -primitive termites

Evolution of the soldier caste
- -reproductive soldiers are precursor to sterile soldiers
- -intercolonial aggression towards the other colony's reproductives

Thorne, B. L., N. L. Breisch and M. L. Muscedere. 2003. Evolution of eusociality and the soldier caste in termites: influence of intraspecific competition and accelerated inheritance. PNAS, 100 (22) 12808-12813.

Thorne, B.L. 1997. Evolution of Eusociality in Termites. Annual Review of Ecology and Systematics 28: 27-54

By Lisa Wang

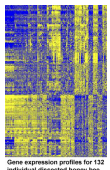
Charles W. Whitfield

University of Illinois, Assistant Professor

Department of Entomology, Neuroscience Program, Program in Ecological and Evolutionary Biology

Ph.D. – Stanford University, 2000

B.S. – UC Davis, 1994



Gene expression profiles for 132 individual dissected honey bee brains (columns).

Molecular mechanisms and molecular evolution of social behavior

Use microarrays to associate gene expression in the brain with different behaviors in honeybees

Working on developing an efficient and low-cost genotyping resource for the honeybee

Use bioinformatics to indentify DNA sequences that regulate gene transcription

Sen Sarma M, **Whitfield CW**, Robinson GE. Species differences in brain gene expression profiles associated with adult behavioral maturation in honey bees. *BMC Genomics*. 2007. Jun 29;8:202.

Whitfield CW, Cziko AM, Robinson GE. Gene expression profiles in the brain predict behavior in individual honey bees. Science. 2003. Oct 10; 302(5643):296-99.

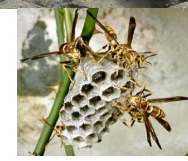
Whitfield CW, Band MR, Bonaldo MF, Kumar CG, Liu L, Pardinas JR, Robertson HM, Soares MB, Robinson GE. Annotated expressed sequence tags and cDNA microarrays for studies of brain and behavior in the honey bee. *Genome Research*. 2002. Apr; 12(6):555-66.

By Lisa Wang

Sean O'Donnell

University of Washington Animal Behavior Program, Department of Psychology, Professor

Ph.D. Zoology and Entomology, 1993; M.S. Entomology, 1989 – University of Wisconsin
B.S. Biology, 1986 – Saint Joseph's University



•Regulations of division of labor in paper wasps

•Evolution of the brain structure in social insects

•Community ecology of army ants and their avian associates

O'Donnell, S., N.A. Donlan, & T.A. Jones. 2004. Mushroom body structural plasticity is associated with temporal polyethism in eusocial wasp workers. *Neuroscience Letters* 356: 159-162.

O'Donnell, S. 2001. Worker age, ovary development, and temporal polyethism in the swarm-founding wasp Polybiaoccidentalis (Hymenoptera: Vespidae). Journal of Insect Behavior 14: 201-213

O'Donnell, S., A. Kumar & C. Logan. 2010. Army ant raid attendance and bivouac-checking behavior by Neotropicalmontane forest birds. Wilson Journal of Ornithology 122: 503-512.

By Lisa Wang

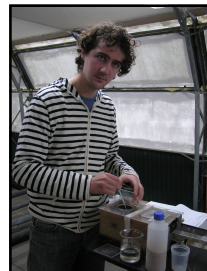
Kenji Matsuura

Associate Professor
Laboratory of Insect Ecology
Graduate School of Environmental Science
Okayama University

Interesting Results: (1) Termite queens adjust egg size according to colony development (2) Identification of a pheromone regulating caste differentiation in termites (3) Cuckoo fungus mimics termite eggs by producing the cellulose-digesting enzyme beta-glucosidase

References: (1) Matsuura K., Himuro, C., Yokoi T., Yamamoto Y., Vargo E. L. and Keller, L.: Identification of a pheromone regulating caste differentiation in termites. *Proc. Natl. Acad. Sci. USA* Published online before print July 6, 2010, doi: 10.1073/pnas.1004675107 (2) Matsuura, K. and Kobayashi N.Termite queens adjust egg size according to colony development. *Behavioral Ecology* 2010; doi: 10.1093/beheco/arq101 (3) Matsuura, K., Yashiro, T., Shimizu, K., Tatsumi, S. and Tamura, T.: Cuckoo fungus mimics termite eggs by producing the cellulose-digesting enzyme beta-glucosidase. *Current Biology*, 19, 30-36 (2009).

By Scott Trageser



Dr. Mathieu Lihoreau

School of Biological and Chemical Sciences
Queen Mary, University of London

Broadly interested in the evolution of sociality in arthropods. A major goal of his research is to understand why and how individuals organize in social groups, be them loose aggregates or highly integrated colonies.

2009 - present: Postdoctoral researcher - Queen Mary, University of London "Bees and the travelling salesman problem: how tiny brains solve complex cognitive tasks"
2005-2009: **PhD** - University of Rennes 1 "Organization and functioning of social groups in a gregarious cockroach: another insect society".
2003-2005: **Master's degree** – University of Rennes 1 "Percepetion of conspecifics and kin recognition in a presocial insect *Blattella germanica*". "Chemical analyses of Spanish ants of the genus Aphaenogaster".
2002-2003: **Bachelor's degree** – University of Tours

By Scott Trageser

Dr. Nico Blüthgen
Faculty of Biology, University of Würzburg

1999-2003 Research for Dissertation ('How availability and quality of nectar and honeydew shape an Australian rainforest ant community')

Interests: Why so many insect species **coexist** and feed on the same resources. His main objective is to understand mechanisms of resource partitioning, competition and specialisation in **ant-plant**, **flower-pollinator** and **plant-herbivore** relationships, as well as interspecific **ant-ant**, **bee-bee** and **ant-bee** interactions

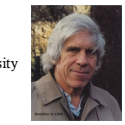
Drescher J, Blüthgen N, Schmitt T, Bühler J, Feldhaar H (2010) Societies driftig apart: behavioural, genetic and chemical differentiation between supercolonies in the yellow crazy ant *Anoplolepis gracilipes*. **PLoS One** 5: e13581

Menzel F, Woywod M, Blüthgen N, Schmitt T (2010) Behavioural and chemical mechanisms behind a Mediterranean ant-ant association. **Ecological Entomology**

Leonhardt SD, Blüthgen N & Schmitt T (in press) Chemical profiles of body surfaces and nests from six Bornean stingless bee species. **Journal of Chemical Ecology**

By Scott Trageser

Who's Who: W. D. Hamilton (1936 – 2000)



B. S. at St. John's College, Cambridge
Ph.D. at London School of Economics and University College of London

Hamilton's Rule

Sex Ratios

Origins of Sex

Parasites

Contracted malaria in the Congo while researching the AIDs virus

By Alex Walton

Who's Who: Lars Chittka

- Currently a Prof. in Sensory and Behavioural Ecology at the School of Biological and Chemical Sciences at Queen Mary, University of London.
- Areas of Interest include: sensory physiology and learning psychology; insect color vision and flower signals; bee navigation; the evolution of cognition and communication; and pollination biology of invasive plants.
- Elected fellow of The Linnean Society of London and The Royal Entomological Society
- Past: Wurzburg University (senior lecturer)
  SUNY Stony Brook (Post Doc)
  Free University Berlin (Post Doc,PhD, MS)

- Publications:

Skorupski P. & **Chittka L**. (2011). Is colour cognitive? *Optics and Laser Technology* 43:251-260

Chitka L, Skorupski P & NE Raine. (2009). Speed-accuracy tradeoffs in animal decision making. *Trends in Ecology & Evolution* 24: 400-407

- **Chittka, L.** (2004) Dances as windo3ws into insect perception. *PLoS Biology* 2:898-900.
- **Chittka, L.**, Thomson, J.D. Waser, N.M (1999) Flower constancy, insect psychology, and plant evolution. *Naturwissenschaften* 86: 361-377.

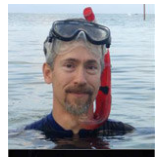
By Alex Walton

Who's Who: Stephen Pratt

- Assistant Professor in Organismal,
- Integrative, and Systems Biology at ASU
- PhD at Cornell under Thomas Seeley
- Study Interest: Collective behavior; emergent order; decision making during colony emigration in *Temnothorax*
- "Quorum" sensing by encounter rates
- Use of robotics and algorithms to model social insect behavior

By Alex Walton

J. Emmett Duffy



Professor of Marine Science
Virginia Institute of Marine Science
College of William and Mary

Ph.D. Marine Sciences, University of North Carolina at Chapel Hill

Research interests:
(1) studies of how animal functional diversity influences community and ecosystem processes in seagrass beds of Chesapeake Bay, and (2) systematic, ecological, and behavioral studies of the evolutionary radiation of sponge-dwelling shrimp on Caribbean reefs.

Selected publications:
Duffy, J.E. and K.S. Macdonald III (2010) *Kin structure, ecology, and the evolution of social organization in shrimp: A comparative analysis*. Proceedings of the Royal Society of London B Biological Sciences 277:575-584.

Duffy, J.E. (2006) *Eusociality in a coral-reef shrimp*. Nature 381: 512-514.

Tóth, E. and J.E. Duffy (2008) *Influence of sociality on allometric growth and morphological differentiation in sponge-dwelling alpheid shrimp*. Biological Journal of the Linnean Society 94:527-540.

By Ryan Ruboyianes

Jürgen Gadau

Associate professor
Organismal, Integrative, & Systems Biology
Arizona State University

Ph.D. 1997, University of Würzburg

Research interests:
The genetic basis of speciation and adaptation. The study of social and solitary insects to describe how genetic and epigenetic variations generate differences in observed morphology, physiology and behavior.

Selected publications:
J. Gadau, et al. (2010) *A comparison of recombination frequencies in intra- versus interspecific mapping populations of Nasonia*. Heredity.

J. Gadau, et al. (2008) *Caste determination in a polymorphic social insect: nutritional, social, and genetic factors*. American Naturalist.

J. Gadau, et al. (2007) *Sociality and genomic recombination*. Heredity.

By Ryan Ruboyianes

Gene E. Robinson

Professor
Department of Entomology
University of Illinois at Urbana-Champaign

Ph.D. 1986, Cornell University

Research interests:
"Using *Apis mellifera* to understand mechanisms governing social behavior"
(1) Changes in honey bee brain structure (2) changes in honey bee brain chemistry (3) genes influencing behavioral maturation and division of labor.

Selected publications:

Robinson, G.E., Grozinger, C.M. and C.W. Whitfield. 2005. *Sociogenomics: Social life in molecular terms*. Nature Reviews Genetics

Whitfield, C.W., Cziko, A.-M. and G.E. Robinson. 2003. *Gene expression patterns in the brain predict behavior in individual honey bees*. Science 302: 296-299

Robinson, G.E. and Y. Ben-Shahar. 2002. *Social behavior and comparative genomics: New genes or new gene regulation?* Genes, Brain and Behavior 1: 197-203

By Ryan Ruboyianes