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## Curriculum Vitae Professor Dr Eric J. Warrant



Image: Sara Warrant

**Name:** Eric James Warrant

**Born:** 7 March 1962

### **Research Priorities: Visual ecology, nocturnal vision, animal navigation, animal migration**

Eric Warrant is an Australian-Swedish sensory biologist. He studies how insects use their vision and other sensory information to orient themselves and to navigate at night. He has established the basic principles that enable animals to see well in extremely dim light, which has led to new camera technologies that work much better at night.

### **Academic and Professional Career**

- since 2022 Head, Lund Vision Group, Department of Biology, University of Lund, Lund, Sweden
- since 2018 Adjunct Professor, University of South Australia, Adelaide, Australia
- since 2018 Visiting Fellow, Australian National University, Canberra, Australia
- since 2010 Visiting Professor, Research School of Biology, Australian National University, Canberra, Australia
- since 2002 Professor of Zoology, Department of Biology, University of Lund, Lund, Sweden
- since 1999 Visiting Professor, Smithsonian Tropical Research Institute, Panama City, Panama
- 1997 - 2002 Senior Lecturer, Department of Zoology, University of Lund, Lund, Sweden
- 1996 Docent, Department of Zoology, University of Lund, Lund, Sweden
- 1992 - 1997 Research Fellow, Department of Zoology, University of Lund, Lund, Sweden
- 1990 - 1992 Postdoctoral Fellow, Department of Zoology, University of Lund, Lund, Sweden
- 1985 - 1990 PhD, Research School of Biological Science, Australian National University, Canberra, Australia

1980 - 1984 BSc First Class with Honours, Physics, University of New South Wales, Sydney, Australia

### **Functions in Scientific Societies and Committees**

2025 President, Royal Physiographic Society, Sweden

2024 - 2028 Member, Board, Royal Physiographic Society, Sweden

since 2023 Reviews Editor, Austral Entomology

2022 - 2024 Past President, International Society of Neuroethology, Lawrence, USA

since 2020 Senior Editorial Board, Journal of Comparative Physiology A

2019 - 2022 President, International Society of Neuroethology, Lawrence, USA

2017 - 2020 Chairman, Committee for Organismic Biology, Swedish Research Council, Sweden

2016 - 2024 Member, Executive Committee, International Society of Neuroethology, Lawrence, USA

since 2014 Member, Academic Editorial Board, Proceedings of the Royal Society B: Biological Sciences

2013 - 2019 Member, Board, Royal Physiographic Society, Sweden

2010 - 2013 Member, National Evolutionary Synthesis Center Group on Vertebrate Visual Evolution, Duke University, Durham, USA

2008 - 2020 Member, Advisory Board, Journal of Comparative Physiology A

2008 - 2017 Vice Chairman, National Committee for Biology, Royal Swedish Academy of Sciences, Sweden

2005 - 2017 Founder and Director, The Solander Program – research exchange program between Universitas 21 universities in Sweden, Australia and New Zealand, the Universities of Lund, Melbourne, Queensland, New South Wales and Auckland

### **Project Coordination, Membership in Collaborative Research Projects**

2022 - 2026 Project “Finding the way in the dark: The sensory basis for navigation in nocturnal animals”, Swedish Research Council, Sweden

2017 - 2022 Advanced Grant “Hunting for the elusive magnetic sense: magnetic orientation and sensation in a nocturnal migratory moth”, European Research Council (ERC)

2017 - 2021 Project “Vision in the dark: Vision and visual navigation in nocturnal animals”, Swedish Research Council, Sweden

- 2014 - 2019 Project “The magnetic compass sense of a nocturnal long-distance migratory moth, the Bogong moth (*Agrotis infusa*)”, Air Force Office of Scientific Research, USA
- 2012 - 2016 Project “Visual flight control in dim light: The physiological and behavioral mechanisms of visually-guided flight in nocturnal hawkmoths”, Air Force Office of Scientific Research, USA

### Honors and Awarded Memberships

- since 2023 Member, German National Academy of Sciences Leopoldina, Germany
- 2021 Dela med Dig Prize for Science Communication, Swedish Research Council, Sweden
- 2022 Fellow, Royal Institute of Navigation, London, UK
- 2019 President, Academic Society of Lund, Lund, Sweden
- 2016 Member, Academic Society of Lund, Lund, Sweden
- 2015 PROSE Award, Textbook/Biological and Life Sciences, Association of American Publishers, Washington D.C., USA
- 2013 - 2019 Member, Board, Royal Physiographic Society, Sweden
- 2013 Ig-Nobel Prize in Biology and Astronomy, Annals of Improbable Research, Cambridge, USA
- 2010 Student’s Choice Award for Teaching Excellence, University of Lund, Lund, Sweden
- 2008 Foreign Fellow, Royal Danish Academy of Sciences and Letters, Denmark
- 2006 Short-List, Körber European Science Prize, Körber-Stiftung, Hamburg, Germany
- 2005 Fellow, Royal Physiographic Society, Sweden
- 1997 - 1998 Schering Fellow, Institute for Advanced Studies (Wissenschaftskolleg zu Berlin), Berlin, Germany

### Research Priorities

Eric Warrant is an Australian-Swedish sensory biologist. He studies how insects use their vision and other sensory information to orient themselves and to navigate at night. He has established the basic principles that enable animals to see well in extremely dim light, which has led to new camera technologies that work much better at night.

Eric Warrant and his research group were the first to determine that nocturnal insects have extraordinary night vision despite their tiny eyes and brains, and that they rely on visual information to orient and navigate at night. Together with his research group, Eric Warrant discovered that some nocturnal insects possess trichromatic colour vision which they use to find

flowers at night. He has also discovered that other nocturnal insects use visual landmarks to navigate home after a long foraging trip at night, and that some use the weak pattern of polarized light which forms around the moon to maintain a straight-line course. If the moon is absent, they can instead rely on the broad band of light in the Milky Way.

Recently, Eric Warrant discovered that the Bogong moth, which migrates over a thousand kilometres from across southeast Australia to a small number of caves in the Australian Alps, uses the earth's magnetic field and the stars as a compasses to reach its final destination, a place it has never previously been.

The biologist was further able to show that the extraordinary visual abilities of nocturnal insects are based on neuronal summation mechanisms in the brain. This processing strategy significantly increases the reliability of vision in dim light by summing light in time and space, enhancing the perception of slower and coarser visual details while maintaining colour information. This real-time processing strategy has been successfully implemented in camera technology.