

NEWS

Jennifer Hobbs wins the 2015 JEB Outstanding Paper Prize

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The Editors of Journal of Experimental Biology are delighted to announce that Dr Jennifer Hobbs from Northwestern University, USA, is the winner of the 2015 JEB Outstanding Paper Prize. Awarded in memory of Bob Boutilier (JEB Editor-in-Chief 1994–2003), the prize recognises the junior author who made the most significant contribution to an outstanding paper. Hans Hoppeler, the journal's Editor-in-Chief, says, 'The Outstanding Paper Prize winner is selected from a crop of remarkably outstanding papers and represents a truly outstanding achievement'. Considering the challenges faced by young scientists as they develop their careers, Hoppeler adds, 'Promising young scientists need encouragement, but they also need a goal worth aspiring to', and he hopes that the recognition that the journal offers will assist young scientists during the early stages of their careers. This year's winner was selected from a strong shortlist of papers – available at the end of this article – covering topics ranging from heat tolerance in passerines to a study of sandfish and shovel-nosed snakes 'swimming' through sand.

Hobbs was the lead author on 'Probability distributions of whisker–surface contact: quantifying elements of the vibrissotactile natural scene', published in August 2015. Considering the paper, journal Editor Michael Dickinson says, 'This paper took a modelling approach that was rigorous with respect to both its ethological and quantitative perspective and I suspect it will have great impact on future research in this field'. He adds, 'The paper demonstrated how the whiskers [of rats] operate as a complex sensing system in which the movements of the head are critically important, just as the information flowing through our fingertips is dependent on the movement of our arms'.

For Hobbs, the news of her win came in overnight by email. 'The funny thing is I heard the "ding" go off on my phone and I wondered, "who is emailing me"?' Then I looked in the morning and it was pretty exciting. It was a great way to start my day', she chuckles. And Hobbs' thesis advisor, Mitra Hartmann, says, 'I was so happy for Jen and I think it really reflects her hard work and creativity'.

However, Hobbs admits that her arrival in Hartmann's lab was somewhat unconventional. 'I have the craziest background', she laughs, recalling that she initially embarked on a career in high-energy physics. 'Starting my sophomore year of undergraduate, I began working with a professor in the physics department, Heidi Schellman, out at Fermilab on MINERvA, which was a neutrino experiment. At that point we were building the detector and I really enjoyed it', says Hobbs. And when the time came to select her graduate school lab, Hobbs elected to continue working with Schellman. However, as time progressed, Hobbs began to wonder whether her heart truly lay in the world of particle physics. 'As we finished building the detector, I realised that that was a small portion of the lifetime of a particle physicist', she says, adding that she began to accept that she didn't really enjoy doing the calculations



Jennifer Hobbs, winner of the 2015 JEB Outstanding Paper Prize.

that are essential for particle physics. Yet, Schellman was very supportive: 'Heidi said, "If you don't enjoy doing them, you are not going to enjoy doing this on a daily basis. You need to look to see what you are really excited about"'. Fortunately, Hobbs had taken neuroscience classes as part of her triple major Integrated Science degree and when she was directed toward Mitra Hartmann, she realised that she had finally found the lab where she could settle to complete her PhD.

Hartmann focuses on understanding how animals interact with and sense their surroundings and Hobbs joined a dedicated team of students and post docs that were getting to grips with how rodents perceive their environment through the contacts that their whiskers make with structures. At the time that Hobbs joined the lab, they had already built a simulated cyber-rat head, complete with 62 whiskers, that could be used to test how the whiskers interact with objects in the vicinity. Having positioned the cyber-rat's head in thousands of different positions relative to a wall and a tunnel, Hobbs was faced with the gargantuan task of decoding and interpreting the data. She initially approached the problem from the perspective of how individual whiskers interact with the environment, but then it occurred to her that she needed to switch perspective. '[I realised that] this is very abstract... I can make some kind of observations that look at these whiskers that have similar mappings across what surfaces they are able to contact, but can I think of it from the animal's perspective?' Hobbs questioned. Calculating the chances of each whisker contacting a surface as they whisked to and fro while the rat held its head in a specific position relative to a wall or tunnel, Hobbs eventually began making headway in understanding how rats perceive their surroundings. 'What I think was really remarkable about Jen was her intuition, her geometric intuition about what stimuli might be important', says Hartmann, adding,

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'I have never met a person who was more receptive to new opportunities. Her intense curiosity about every possible question we could ask made her a joy to work with'.

Talking to Hobbs, it is clear that she attributes much of her enthusiasm and passion for science to inspirational teachers and mentors that she encountered during her education, especially her 7th grade junior high school teacher, Todd Stirn. 'There are things I learned in his class that made me feel like I had a leg up on people by the time I got to college', she acknowledges. She also credits her high school teachers and mentors for inspiring her to pursue maths and physics. 'The math that I learned when I was on math team in high school was hands down more important than anything else that I have ever learned in a structured class', she says. And Hobbs notes how her parents have always supported and encouraged her curiosity, whether it was working with them on a science fair project or preparing for a science Olympiad; even if it did occasionally cause science chaos in the home.

However, as she neared the end of her graduate career, Hobbs faced a dilemma. Having grown up and studied in the Chicago area, she realised that she was reluctant to leave. 'I thought that even if I went, I would go some place to do a post doc for a couple of years, but then what would happen? There is a lot of uncertainty', she says. After months of soul searching, Hobbs eventually realised that she wanted to stay in Chicago and pursue an alternative career. 'It was a very hard decision', she says, admitting that she also hated the thought of leaving teaching, having taught numerous quarters during her time at Northwestern. Nevertheless, she has not abandoned her passion for discovery. Having participated in the statistical analysis on another project while in Hartmann's lab, she

decided to transfer her skills to predictive analytics and recently joined a team of statisticians at Zurich Insurance. 'The work I am doing is very project structured and open ended and exploratory, so a lot like grad school', smiles Hobbs, adding that the problems inspire her in much the same way that her work with Hartmann did. 'I have all these data; what does it mean, what does it tell me, what can I do with it?' she laughs, thinking about the next exciting challenge in her life.

Outstanding Paper Prize Shortlist 2015

- Clifton, G. T., Hedrick, T. L. and Biewener, A. A.** (2015). Western and Clark's grebes use novel strategies for running on water. *J. Exp. Biol.* **218**, 1235-1243.
- Hobbs, J. A., Towal, R. B. and Hartmann, M. J. Z.** (2015). Probability distributions of whisker-surface contact: quantifying elements of the rat vibrissotactile natural scene. *J. Exp. Biol.* **218**, 2551-2562.
- Meuti, M. E., Stone, M., Ikeno, T. and Denlinger, D. L.** (2015). Functional circadian clock genes are essential for the overwintering diapause of the Northern house mosquito, *Culex pipiens*. *J. Exp. Biol.* **218**, 412-422.
- Putman, N. F., Verley, P., Endres, C. S. and Lohmann, K. J.** (2015). Magnetic navigation behavior and the oceanic ecology of young loggerhead sea turtles. *J. Exp. Biol.* **218**, 1044-1050.
- Sharpe, S. S., Koehler, S. A., Kuckuk, R. M., Serrano, M., Vela, P. A., Mendelson, J., III and Goldman, D. I.** (2015). Locomotor benefits of being a slender and slick sand swimmer. *J. Exp. Biol.* **218**, 440-450.
- Talbot, K., Kwong, R. W. M., Gilmour, K. M. and Perry, S. F.** (2015). The water channel aquaporin-1a1 facilitates movement of CO₂ and ammonia in zebrafish (*Danio rerio*) larvae. *J. Exp. Biol.* **218**, doi:10.1242/jeb.129759.
- Whitfield, M. C., Smit, B., McKechnie, A. E. and Wolf, B. O.** (2015). Avian thermoregulation in the heat: scaling of heat tolerance and evaporative cooling capacity in three southern African arid-zone passerines. *J. Exp. Biol.* **218**, 1705-1714.
- Zhang, E. and Nieh, J. C.** (2015). The neonicotinoid imidacloprid impairs honey bee aversive learning of simulated predation. *J. Exp. Biol.* **218**, 3199-3205.