

Cynthia F. Moss

It Was a Bat Year



Cynthia Moss was born in Columbus, Ohio on July 5, 1957. She received her B.S. (*summa cum laude*) from the University of Massachusetts in 1979 and her Ph.D. from Brown University in 1985. After NATO and AAUW postdoctoral fellowships at the University of Tübingen, Germany, she was a faculty member at Harvard University, where she was named Morris Kahn Associate Professor. She is now Professor at the University of Maryland, College Park. Over the years, she has conducted research on visual, auditory, and gustatory systems, using subjects ranging from flies to frogs, and humans to bats. Her current research program aims to advance the understanding of how sensory information is processed, organized, and integrated with motor programs to permit perceptually-guided behavior. Work in her lab includes modeling and empirical studies of auditory information processing, scene analysis, adaptive motor control, and the neural mechanisms supporting sensorimotor integration, using the echolocating bat as a model system. – Address: 105 Hodges Lane, Takoma Park, MD 20912, USA.

For me, as always, the echolocating bat was a topic of serious inquiry this year. But I also took the opportunity to consider perception in other animals and through modalities other than audition. Discussions with philosophers, historians, and philologists at the Wissenschaftskolleg enriched this pursuit tremendously. György Ligeti's provocative questions always stimulated interesting exchanges at lunch and dinner. Many hours were devoted to the question, "Can a machine think?"

Regular meetings with Hans-Ulrich Schnitzler and Carola Eschenbach, my immediate colleagues in the Spatial Cognition working group, inspired new research directions and experiments. Especially fruitful were our meetings on foot through the Grune-

wald, where we discussed experimental approaches to study spatial concepts in bats and other animals. Some of these ideas are already being tested in my lab. I should mention that my work this year depended on daily contact with students and research assistants in my lab in the U.S., who sent me data and asked for my input on research directions.

Our Spatial Cognition Workshop in February brought together a diverse group of researchers, from computer scientists and neurobiologists to psychologists and behavioral ecologists, who stimulated me to think about my research in a broader context. Particularly inspiring were discussions with Barrie Frost from Queens University about perceptual experiments and virtual reality. Most memorable for me was a comment by Carola Eschenbach on the second day of the workshop: We experimented one afternoon with smaller working groups, and when we met to discuss how to proceed with the remaining time, Carola insisted that we reconvene in one large group. "We missed the bat people," she said.

On another occasion, another pro-bat sentiment was expressed by philosopher Richard Bernstein, "Bats are so interesting ... how could one study anything else?" Conducting research on an animal that is commonly the object of fear and disdain, I found it such a pleasure to spend a year with people who seemed to truly share our enthusiasm for the echolocating bat. Yes, as Wolf Lepenies titled his closing remarks for the year, "It was a bat year!"

I understand that a common theme of annual reports from the Fellows of the Wissenschaftskolleg is the regret that one didn't accomplish even a small fraction of the work planned. While there are certainly more things I might have done during this year, I am going to break with tradition and express my gratitude for the time here that allowed me to accomplish a great deal. My work during this year included writings begun before I arrived and new ones started here, some initiated as late as May. I completed four scientific articles, "Auditory scene analysis by echolocation in bats" with Annemarie Surlykke, "A computational model of sensorimotor integration in bat echolocation" with Harry Erwin and Willard Wilson, "Orienting responses and vocalizations produced by microstimulation of the superior colliculus of the echolocating bat" with Doreen Valentine and Shiva Sinha, and "Multimodal localization of a flying bat" with Kaushik Ghose, D. Zotkin, and R. Duraiswami. I also finished four book chapters, "Comparative Audition" with Catherine Carr, "Vocal learning and development in mammals and birds" with Janette Boughman, "Audiovocal feedback control and acoustically-

guided behavior in echolocating bats” with Gerd Schuller, and “Sensory-motor behavior of free-flying FM-bats during target capture” with Willard Wilson. During this year, I completed editing a book for Chicago University Press, *Advances in the study of echolocation in bats and dolphins*, with Jeanette Thomas and Marianne Vater. In addition, I wrote a major grant proposal to the National Science Foundation, “Active sensing for three-dimensional auditory localization”, which has just been funded. During this year, I also negotiated the final stages for funding a training grant I submitted to the National Institutes of Mental Health for graduate and postdoctoral training at the University of Maryland, “Neuroethology: Neurobiology, Evolution and Behavior”. Finally, Schnitzler and I have almost finished writing a review article for *Trends in Evolution and Ecology*, “From spatial orientation to food acquisition in echolocating bats”. Our attention to the final details of this paper ensures that Schnitzler and I will keep in close contact in the upcoming months.

I'd like to take this opportunity to thank the Rektor, Wolf Lepenies, and the academic administration at the Wissenschaftskolleg for making it possible for me to spend this very rich year in Berlin. The resources and facilities of the Wissenschaftskolleg were extraordinary. Never before (and I suspect never again) have I had library support that compares with what was provided by the staff at the Wissenschaftskolleg. Ready access to computers and the Internet allowed me to communicate easily with my lab in the U.S. and to analyze my data here. Our extremely thick file in Andrea Friedrich's office is testimony to all the paperwork she submitted on our behalf, and for this she deserves a medal. And last, but certainly not least, I'd like to thank Monika Fogt, Gerhard Riedel, Barbara Sanders, and Lorena Jaume-Palasi for their assistance with day-to-day practical matters that made it possible for me, my husband, and three children to settle in so comfortably here.