



## A MULTIPLICITY OF WIKOS NATASHA MHATRE

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Natasha Mhatre was born in 1979 in Bombay or, as it's now known, Mumbai, India. She studied at St. Xavier's College and received her B.Sc. from Mumbai University in 1999. She then moved to Bangalore where she got her M.Sc. in 2002 and Ph.D. in 2008 from the Indian Institute of Science. She then began working on a collaborative project between IISc and the University of Bristol and eventually transitioned to a Marie Curie post-doctoral fellowship held at Bristol. Her research interests lie in the intersection between biology and physics. She investigates how the physics of the animal and its environment affects biological function. So far, she has worked primarily on physical constraints and innovations in acoustic communication systems. In her project at the Wiko, she began work on the interplay between the physical environment of water and the sensory systems of microscopic algae that live in it. – Address: Integrative Behaviour and Neuroscience Group, Department of Biological Sciences, University of Toronto at Scarborough, 1265 Military Trail, Scarborough, ON, M1C 1A4, Canada.  
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### The planned Wiko

I had come to Wissenschaftskolleg with a few plans. Some goals were, of course, declared: my projects for the year. I wanted to understand how unicellular algae might use mechanosensation to help them live in the difficult physical environment, a highly viscous or low Reynold's number environment. The idea was to both make my way through the

literature and to run some simulations. The other declared project was to write stories, fiction that helped explain both science and scientists.

I had, of course, a private agenda as well. I had spent three years in Bristol getting caught up with the new field I was working in. As a postdoctoral fellow, keen on getting my scientific career going, I had worked almost to the exclusion of everything else. I tend to introversion, sitting in a quiet room, getting on with my work. This phase of my career had indulged my proclivities. I had a few good papers and a pile of unpublished data to show for my time in Bristol. The need of the hour seemed to be to start publishing some of that pile, but also to look up from my work. I wanted to make up for the three years in which I had met very few new people, especially outside science. I wanted to develop an ability to work against my natural proclivity. The Kolleg promised, or rather, required engagement between its Fellows, so much the better. I attribute any success I had to the Kolleg's design and the warmth at that my Co-Fellows showed me.

So, thank you; I have no natural skills at this.

### The general and the idiographic Wiko

I had read the reports from previous years and spoken to a few people who had been Fellows at the Wiko before. I had formed some notion of what the six months would be like. I also knew that there would be things that no one could know about. I was not a part of a Focus Group and knew no one but Hari Sridhar in the group of Fellows that I was to join. I expected that my Co-Fellows would be smart and scholarly, but I couldn't anticipate the sort of bonds we would form. The intelligence and the wit I expected, I did not expect the generosity of time and spirit, warmth and affection that I encountered. I was told of the superb food and wine and looked forward to it, but I did not expect to have the chance to taste an Islay from pretty much every distillery there is. I suppose nobody can know what a class, as the Wiko terms it, will be like and one can't prepare for it. It belongs to a class of phenomenon I may have a mild obsession for: emergent phenomena.

There is a general Wiko. This place exists because the staff works very hard to bring it into being. This is a place where everything works perfectly. The apartments are magnificent, so are their environs. Moves are seamless. All logistics are taken care of and one is helped through every single bureaucratic hurdle. The lunches and dinners are superlative and IT is unimpeachable. No book or research paper is unobtainable. The Wiko

staff organized everything and then organized the entertainment as well. We had the most magnificent musical concerts and receptions; they always went the extra mile. I suspect that everyone who comes to Berlin to work at the Wiko encounters this Wiko. I was and remain grateful for it.

The staff are remarkable. Giovanni Frazzetto made an immense effort to make me feel at home right from the beginning, often organizing events and outings for us and even inviting us home for a wonderful brunch. By the end of the year, he found himself dubbed “fearless leader” by a gang of slightly rowdy College for Life Scientists. I will always count him among my dear friends. Kathrin Biegger was also very generous. She very kindly invited me to stay longer than I was meant to so I could meet a guest of the Kolleg. Corina Pertschi, Antje Radeck and Nina Kitsos jumped into the breach and smoothed away all bureaucratic hurdles. They helped me even after I had left the Kolleg. I was in the UK and faced a problem coming back to Germany for an interview; they need not have, and yet they helped me again. Thorsten Wilhelmy had his second year as Secretary with us. He was always the kindest host, made time from his busy schedule to attend our events, was always there with a solicitous word and even orders to soak up more of the culture Germany had to offer. I cannot be more grateful, not just for the institutional efficiency of the Wiko, but also for the genuine warmth of the people who make it up.

Beyond this Wiko, there was the class that I was part of. I suppose each class is something of an experiment. The selection committee chooses a set of people, we all come to Berlin and the experiment begins. I am sure there are rules to human interactions, but there is also contingency. In Gould’s thought experiment, we can never rewind the tape of this evolution and expect the same outcomes. This is how, from the general institutional framework of the Wiko, something specific emerges. Would you consider me selfish if I am glad that no one can have my specific Wiko ever again? Am I allowed to prize so much the individuality of my experience?

This happy family was made and I reckon was happy in its unique way. I found an interlocutor, mentor and friend in Jahnvi Phalkey right away. I had to pick an argument and prove myself with Yuri Slezkine before he would agree to be one, but we got there eventually. I spent a great deal of time talking and taking photographs with Tong Lam and appreciate both history and images better as a result. As a bonus, Olivia Judson came and joined our group for a bit towards the end of my time. Again, I’d made another friend I hope to keep forever. Michael Hochberg organized a potluck at the beginning of the year. This kicked off a series of events: a couple of jazz concerts, an evening of very

boisterous Klezmer, dinners that Michael, Jahnavi, Gerald Wilkinson, Felix Breden and I cooked for each other. Partners, children and others were included as and when they were there, but there was always at least one good whisky! These were some of the most memorable times I had that year.

Many members of the class actively contributed to my intellectual endeavours as well. Yair Mintzker, Hari Sridhar and Giovanni Frazzetto very kindly gave of their time and read closely the stories I had written and commented on them. So did Simon Teuscher and Emmanuel Didier and I thank them for the time they took from their busy schedules. Kathleen Coleman organized a series of excellent symposia on visual arts and very kindly invited me to present. I could not believe the number of people who willingly took an hour of their time to see and discuss some of the text art that I've been working on. Gerald Wilkinson, Felix Breden, Andy Higginson, and Kasia Bieszczad took the time to comment on a paper that I am writing on tool use. The College of Life Sciences crew, Hari Sridhar, Mícheál de Barra, Andy Higginson, Kazia Bieszczad and I, spent quite a few companionable evenings working together. This entire class ensured that, even if I accomplished nothing else, I had accomplished my private desire of finding kindred spirits again.

### The working Wiko

I arrived on a Sunday and Vera Kempa came over to see me into my apartment. The beautiful and quiet studio that she let me into would be my home and workplace for the next six months. The trees that surrounded it had red squirrels and this really excited me! There are very few left in the UK, where they've been outcompeted by the invasive Greys. And then, besides the squirrels, the trees obviously had many species of birds in them! I would eventually befriend many through the feeder I set up on my office window. And there were insects! When I had just arrived, it was still early autumn and the air still reasonably warm. I was heartened to hear insects singing from the trees. Klaus Ospald, the composer, once brought me a female katydid, a *Südliche Eichenschrecke* that had wandered into his room. It was, alas, the sex that did not make a sound; only the male does. The silence and the wild creatures both reminded me of Bangalore, and it was this combination that I think made me feel quite at home.

My bed was right next to my office and most days I went straight from one to the other, at the beginning and the end of each day. I fell into a working pattern that also dated back to my years as a graduate student in Bangalore. When I wasn't with my Wiko

Co-Fellows, I was here, reading, writing, coding or debugging. Pippa Skotnes had the studio next door, Tong Lam, Michael Hochberg and Kathleen Coleman had the other apartments on the floor and we bumped into each other often, especially as we all seemed to be fond of tea! Companionable neighbours, endless tea, occasional jazz and work, what more can one ask for?

I had the chance to re-examine many of the stories that I had been writing for my collection. I found I was very unsatisfied with some of the older stories and began to completely rewrite them. I am still rewriting them. I have no more stories than when I had begun, but I have better ones. Having found much more source material, I also have more topics that I want to work on. A good start.

As it turned out, most of my time was devoted to the science. I worked on clearing the pile: a review that I had to write on active processes in insect hearing and a couple of papers that I was writing with my colleagues in Bristol. This was greatly helped along by a visit from my colleague from Bristol, Robert Malkin. I also began work with Prof. Liverpool from the department of Applied Maths in Bristol and we got a simulation study underway. We would meet and work over Skype nearly every week. I was able to begin learning the math from him and have used it in a simulation that models individual microswimmers as non-linear oscillators, to see if patterns of cooperative swimming emerge. We've managed to complete the base code for the project and have already seen some interesting preliminary results by the end of my time in Berlin. Much more work, however, needs to be done and we hope to get to the first manuscript within a year.

I also made my way through a large part, though not all, of the reading I had hoped to do. So far, most of my reading on microalgal ciliary motility, mechanotransductive channels and also the effects on collective swimming supports the hypothesis that I propose. The next step would be to carry out the experiments. My time at the Wiko was invaluable in planning this experimental programme, and now the harder job begins: to find both funding and also a lab in which to carry out this programme. I was able to initiate this process from Berlin as well. I was able to develop and to submit several applications for faculty positions, fellowships and grants while in Berlin. Some have resulted in interviews, and I am still waiting for the results of others. An equivalent effort would have been impossible in any other situation, and I am very grateful for the pause that the Wiko enabled.

## The partially bridged Wiko

Perhaps I should use the more familiar term, the “two cultures”; indeed, each Wiko class is drawn from both. One gets the feeling that in an older Wiko it was more usual to have Fellows from the humanities and that a special effort has been made to bring natural scientists into the programme. This year, as I suppose every year, we had to talk over the walls that separate the disciplines, and there was some good-natured sniping across the boundaries. Felix Breden and Bruce Carruthers certainly exchanged a round of friendly and entertaining fire during their respective Tuesday Colloquia.

As a biologist, I suppose I belong clearly to one culture, but I have a foot, nay a toe in the other, as a photographer, a writer and artist. I’ve even partaken of the academic humanities before coming to Wiko; I’ve attended talks and read books that would traditionally be considered from the humanities. So I was familiar with at least the language. In the six months at the Wiko, I had the opportunity to also develop a sense for the mode of working, the evidence and the motivations that drive academics in the other culture.

I really enjoyed several conversations, particularly with the historians, Jahnvi Phalkey, Tong Lam, Yuri Slezkine, Yair Mintzker, Cheikh Babou, Andrii Portnov and the social scientists, Bruce Carruthers, John Carson and Wendy Espeland. Early on, I discovered that they all shared a deep distrust of the generalizing tendency of scientists. (I might say biologists but we had few non-biologists this year, so I cannot tell. A sad omission; I feel a few physicists would have been an interesting addition to the mix.) I spent much of the rest of the year understanding the sources of this distrust, and I believe there are important cautionary tales there. I don’t believe general explanations are impossible or even uncalled for. But I am now convinced that we, especially as biologists, need to raise the standards for when we allow an explanation to be extended from the specific to the general. Even at the Wiko, there were often claims made that would not be held up by the evidence produced. Although to be fair, the transgressors belonged to both cultures. Similar themes came up in my conversations with Andy Higginson. Despite being biologists, we stand across another divide, the divide between ultimate and proximate explanations, between the evolutionary biologist and the mechanistic biologist (yes, I made that term up). We also came away from our conversations with a similar mutual respect for the other’s concerns. I think this reconfiguration will prove to be an important dimension in my own future research and how I view that of others. It will be something I will always think about.

In the middle of all this, while I was still in Berlin, I would sometimes be frustrated and impatient at how little work I was accomplishing. I would spend a lot of time fretting and thinking about issues sparked by conversations or arguments I had had. I often felt I was allowing my mental space to be occupied too much by the agendas of other people. In retrospect, it seems that I got more done than I felt I did. Since I've left the Wiko, my search for an appropriate place to do my work has continued. I have had no responsibilities that I have not created myself, and I have certainly not been more productive! The impatience I felt in Berlin came from the easy mental trap I had fallen into. I had believed that "time to think" meant time to think only about what I had brought to the Wiko with me. A part of me had expected my work would be the primary focus of all the waking hours in Berlin. I am glad it wasn't. This would have been incompatible with my own secret agenda, but more importantly, I would have done myself a disservice. Had I spent my time focused on my declared projects alone, rather than learning more, I think I would have learnt a lot less.