

Center for Music in the Brain (MIB) – Annual Report 2018

HIGHLIGHTS OF THE YEAR

MIB has now existed for three and a half year, and we are by now fully settled in terms of organization, research infrastructure and administrative and project-related procedures.



Central to the MIB research is the idea that music, structured around the unifying theme of prediction, can advance our understanding of prediction as a fundamental brain principle across a range of functional domains as in our predictive coding of music (PCM) model. Briefly, PCM proposes that music perception, action and learning are recursive Bayesian processes by which the brain attempts to minimize the prediction error between lower-level sensory input and the brain's top-down predictions.

In 2018 we achieved a theoretical breakthrough publishing a new model for predictive coding of rhythmic incongruity (PCRI). This model allows for operationalization of PCM into concrete musical experiments with clearly defined hypotheses for behavioural data as well as for neuroscientific measurements. It has proven important for understanding the brain and cognition, being the central tenet for synergising the strands and thus further development of MIB. The model was also centrally featured in an important review paper accepted in one of the foremost high impact journals, *Trends in Cognitive Science* (Peter Vuust with Stefan Koelsch and Karl Friston, two of the most cited researchers within the field of cognitive neuroscience). Other scientific 2018 highlights include the acceptance for publication of Angus Stevner's PhD work on music and sleep in *Nature Communications*

We kicked off 2018 with the PhD defense of Kira Vibe Jespersen on music and sleep. The year's second PhD defense took place in June when Cecilie Møller defended her thesis on multimodal processing. They were both subsequently employed as postdocs at MIB. Manon Grube was hired as assistant professor, Jan Stupacher as postdoc and we welcomed three new PhD students: Victor Pando, Davide Ligato and Marianne Tiihonen. In September 2018, we hired Marcus Pearce - world leading expert on modelling musical prediction - as a new professor at MIB.

MIB has positioned itself as the leading research centre of its kind in Europe always hosting international researchers. Funded by Aarhus University Research Foundation (AUFF) Dr Ignasi Cos from Universitat Pompeu Fabra, Barcelona visited MIB for 2 months, Dr Andrea Ravnani from Sealcentre Pieterburen, The Netherlands visited us twice, and a number of PhD and postgraduate students from abroad have stayed at MIB for longer or shorter periods of time. Furthermore, MIB hosted a number of prominent guest speakers and collaborators.

In 2018, MIB researchers received several prizes, awards and stipends. For instance, in a highly competitive field, MIB assistant professor Boris Kleber won the Susanne Klein-Vogelbach Prize, and MIB postdoc Jan Stupacher was awarded a 3 year fellowship from the Austrian Research Fund to work on his project "In time with music: A multi-level entrainment framework".

The huge MIB potential for outreach and the growing recognition of MIB both nationally and internationally was highlighted by the request from the Danish Minister for Health, Ellen Trane Nørby to visit us followed by a request for a recommendation to the Danish "Stresspanel". Even more prestigious, the journal *Nature* approached centre leader Peter Vuust to feature him in an article describing his career in which he has been able to combine work and passion. As a further substantial international knowledge of MIB's research, we have been selected to host the Neurosciences and Music VII conference in 2020. This is the key conference in the field of neuroscience and music and will be a unique possibility for further research outreach. Organizing this conference is well underway.

In connection to this conference, we are currently planning an annual summer school in Neuroscience and music. This summer school is part of a special focus to ensure formalized possibilities for our PhD students to teach. We have also implemented the course "Introduction to Music in the Brain" which in the fall of 2018 attracted almost 60 Master's and PhD students from Aarhus University (AU), the Royal Academy of Music and abroad. In addition, MIB researchers took part in organizing a summer school at University of Almeria, Spain; the conference *The Sound of Music i Sundhedsvæsenet in Musikhuset*; and *Worlding the Brain 2018* at AIAS, AU.