

*Talk on Thursday, 24. Mar. 2022**Start: 16:00 (till 17.15)**Online Stream:* <https://us02web.zoom.us/j/86000644240?pwd=MjQ2R2s4dzJrQnFhVmpTdE-pEWGxKQT09>*The talk will be presented in English*

Separating periodic and aperiodic activity to investigate physiology, cognition, and disease

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A key goal of cognitive neuroscience is to understand how patterns of brain activity relate to underlying physiology, cognitive capacities, and disease states. In field recordings (M/EEG, iEEG), while a lot of work has focused on periodic activity (neural oscillations), aperiodic activity (1/f-like activity), a prominent feature of such data, has been less investigated. In this talk, I will discuss issues related to measuring periodic and aperiodic activity, including how common analysis methods may conflate the two. To address these issues, we have introduced a method to parameterizing periodic and aperiodic components from neural power spectra. This approach is demonstrated in a series of applications, including quantifying patterns of activity within individuals, across development, and in disease states, and by showing task-related changes in aperiodic activity. These findings highlight the importance of aperiodic neural activity, the implications and interpretations of which will be discussed. I will also introduce available Python toolboxes for applying these methods and methods testing, including [neurodsp](#) and [specparam](#) (formerly `foof`). Collectively, this work shows how periodic and aperiodic activity are dynamic components, requiring dedicated methods and careful interpretations, and that doing so reveals novel findings relating brain activity to physiology, cognition, and disease.

About Tom Donoghue see: <https://tomdonoghue.github.io/>