Symposium | Temporal Experience

Fri. Oct 17, 2025 5:15 PM - 6:45 PM JST | Fri. Oct 17, 2025 8:15 AM - 9:45 AM UTC Venue 2(Room 2)

[S4] Symposium 4: The Varieties of Temporal Experience: The Past, Present, and Future of Time Perception Research

Chair:Martin Wiener(George Mason University)

Time is experienced in myriad ways, between periods of high stability and instability, governing the ways in which we experience everyday moments, encode memories, make decisions, plan and organize our thoughts. The time perception researcher is thus faced with a challenge unlike other domains: whence to begin?
At the TRF2 meeting, we held a special event dedicated to the near-term goals of time perception research – the timing "moonshot"; in this symposium, we will bidirectionally extend this horizon to provide an overview of the past, the present, and the future of time perception research. That is, what does the history and emergence of timing research tell us about where it may be headed? What are the challenges, both common to other disciplines and unique to our own, in studying "time"? What answers have we achieved, with the advent of new technologies and recording techniques, and what remains unknown, or unknowable? Each of the four speakers will thus provide their own unique perspective on these questions. Unlike other symposia, the talks will be shorter in length and will be followed by a panel discussion among the speakers with a moderator and questions. The intended audience is early career scientists and students, with the goal being to help guide future inquiries and enable success, whether continuing in time perception research or exploring other domains.

5:15 PM - 5:30 PM JST | 8:15 AM - 8:30 AM UTC

[S4-01]

The Varieties of Temporal Experience: The Past, Present, and Future of Time Perception Research

*Martin Wiener[1] (1. George Mason University (United States of America))

5:30 PM - 5:45 PM JST | 8:30 AM - 8:45 AM UTC

[S4-02]

Is Time Special?

*Martin Wiener[1] (1. George Mason University (United States of America))

5:45 PM - 6:00 PM JST | 8:45 AM - 9:00 AM UTC

[S4-03]

Of time and memory in cognitive neurosciences: how the observer flaws our understanding of time

*Virginie van Wassenhove[1] (1. CEA NeuroSpin; INSERM Unicog; Univ. Paris-Saclay (France))

6:00 PM - 6:15 PM JST | 9:00 AM - 9:15 AM UTC

[S4-04]

Temporality and the brain: the long and winding emergence of time in cognitive neuroscience

*Ayelet N Landau[1,2] (1. Hebrew University of Jerusalem (Israel), 2. University College London (UK))

6:15 PM - 6:30 PM JST | 9:15 AM - 9:30 AM UTC

[S4-05]

Measuring the neural clocks: fifteen years of timing neurophysiology

*Hugo Merchant[1], Germán Mendoza[1], Oswaldo Pérez[1] (1. Instituto de Neurobiologia, UNAM, campus Juriquilla (Mexico))

The Varieties of Temporal Experience: The Past, Present, and Future of Time Perception Research

*Martin Wiener[1]

1. George Mason University

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At the TRF2 meeting, we held a special event dedicated to the near-term goals of time perception research –the timing “moonshot”; in this symposium, we will bidirectionally extend this horizon to provide an overview of the past, the present, and the future of time perception research. That is, what does the history and emergence of timing research tell us about where it may be headed? What are the challenges, both common to other disciplines and unique to our own, in studying “time”? What answers have we achieved, with the advent of new technologies and recording techniques, and what remains unknown, or unknowable? Each of the four speakers will thus provide their own unique perspective on these questions. Unlike other symposia, the talks will be shorter in length and will be followed by a panel discussion among the speakers with a moderator and questions. The intended audience is early career scientists and students, with the goal being to help guide future inquiries and enable success, whether continuing in time perception research or exploring other domains.

Keywords: Time Perception, Cognitive Neuroscience, History of Timing, Philosophy of Timing

Is Time Special?

*Martin Wiener[1]

1. George Mason University

Is “time” special? The answer to this question may seem obvious to a group of timing researchers at a timing conference, but the importance of a thing can be obscured by its closeness. In this talk, I will provide a reasoned argument for why the study of time is, in fact, special and why researchers can and should focus their attention to how the brain processes and perceives intervals of time. The title of the talk also reflects the internal conflict that many researchers studying time must face: since time is such an omnipresent feature of consciousness, of what use is there in studying it at all? Are we really studying “time”, or are we using temporal behavior to study other phenomena? This talk will lay out that argument and then proceed to counter it with the alternative view that time is, in fact, special.

Keywords: time

Of time and memory in cognitive neurosciences: how the observer flaws our understanding of time

*Virginie van Wassenhove[1]

1. CEA NeuroSpin; INSERM Unicog; Univ. Paris-Saclay

We segment time into past, present, and future, and scale temporal phenomenologies to “now”, a lifetime or universal times. This operationalization provides a practical approach to the study of temporal cognition, but it also suggests that neural systems process information differently when it is available in the present than when it is not. In cognitive neuroscience, this operationalization also divides the study of time into timing research, which focuses on online time perception (the integration of past experiences and prior knowledge to inform expectations and future predictions) and memory research, centered on the reconstruction of past events and foresight or imagination. Interestingly, both approaches require a temporal coordinate system or reference frame for time to enable the flexible mapping of information. Yet neither domain directly tackles the issue. The physical realization of a mental time axis in the brain currently eludes existing frameworks.

Keywords: time perception

Temporality and the brain: the long and winding emergence of time in cognitive neuroscience

*Ayelet N Landau[1,2]

1. Hebrew University of Jerusalem, 2. University College London

Understanding how our sensory systems generate coherent experiences of the world has been an outstanding quest for centuries. Throughout history, philosophers, biologists, psychologists, and –in the past few decades - cognitive neuroscientists have sought answers to how our brain generates thinking and feeling, behavior, and consciousness. Among the most fundamental aspects of conscious experience is the perception of time. In this talk I will discuss a bias that has characterized this quest: a spatial approach to understanding the neural mechanisms of cognition. I will critically assess this emphasis, offer a historical account, and point to its tacit assumptions and limitations. I will highlight key moments when opportunities to incorporate temporal principles were overlooked. Drawing on recent examples, I will discuss the potential of integrating the temporal domain into our understanding of the brain. Finally, I will show how a temporal prism can illuminate the study of mechanisms of time perception.

Keywords: cognitive neuroscience

Measuring the neural clocks: fifteen years of timing neurophysiology

*Hugo Merchant[1], Germán Mendoza[1], Oswaldo Pérez[1]

1. Instituto de Neurobiologia, UNAM, campus Juriquilla

During the last fifteen-years many laboratories across the globe have recorded the neural activity of different brain areas during timing tasks, including perceptual or motor paradigms that require processing single intervals or rhythmic sequences. A handful of time-varying signals in the discharge rate of neurons have been identified as potential neural clocks. Here, we show how the neural populations of cells in the medial premotor areas and the putamen encode different timing features during a set of timing tasks, strongly suggesting that neural sequences and state space neural trajectories are the substrate of timing and that these signals are interacting dynamically with other sensory and motor execution neural responses of the timing tasks. We are also discussing how this interval timing information needs to be integrated with the incoming neural signals of primary sensory areas to generate efficient loops, especially in rhythmic tasks.

Keywords: neural correlates