



The Daylight Award for Research 2024: Till Roenneberg

Professor Till Roenneberg is Emeritus Professor of Chronobiology at the Institute of Medical Psychology at Ludwig-Maximilian University (LMU) in Munich, Germany. Roenneberg has dedicated most of his career to investigating the effects of light on circadian clocks, sleep, and health.

His work spans the natural and social sciences, and the use of diverse groups of organisms. This comparative and interdisciplinary strategy has allowed Roenneberg to take novel approaches to address key questions relating to the effects of daylight on human health, well-being, and performance.

His fundamental research findings have been both highly cited and influential, and significantly, applied to multiple branches of society, spanning medicine, public policy, and architecture.

In addition to his influential work as a scientist, Roenneberg is a gifted communicator and advocate for the importance of daylight for human health. He works with diverse organisations, giving many public lectures, engages with print, radio, television and other journalists. Roenneberg has also written two popular science books.

Jury Reasoning

Roenneberg's interest in light was present in his first years as a scientist. He was one of the first chronobiologists to appreciate that both the intensity and the spectral composition of light was key in understanding how light affects the circadian system in a range of organisms, including Dinoflagellates (a unicellular algae) and fungi (*Neurospora Crassa*).

After establishing key concepts related to light and circadian rhythms, Roenneberg transitioned to human and social sciences with a focus on daylight. Roenneberg used his experience in experimental bench-based chronobiology and in using big data to address research questions that focus on human daily behaviour in real life.

He developed and validated a new questionnaire – the Munich ChronoType Questionnaire, MCTQ – to enable investigations of circadian entrainment in populations across the world. The resulting database has over 400,000 entries and has allowed him to probe important questions in “real-life experiments”. His results have been published as well as widely cited in influential publications spanning the natural sciences, human science, and social science.



Roenneberg pioneered the epidemiology of chronotypes (the phase relationship of the circadian clock and the natural daylight-dark cycle; the familiar larks and owls). He showed, for example, that relative timing of human entrainment (“chronotype”) systematically changes with age (putting the late-hour preferences of teenagers in a biological perspective) and with daylength. He worked with the steel industry to evaluate and allocate workers to their chronotype-specific shift. This change resulted in significantly improved sleep for most individuals.

A key observation by Roenneberg is the demonstration that human clocks are profoundly influenced by the natural light/dark cycle, despite increasing urbanisation.

Roenneberg has become notably influential as the creator of the “social jetlag” concept, which has achieved approximately 27,000 citations in Google Scholar. Social jetlag is the difference in sleep timing between work and free days and reflects changes individuals must make for work that are counter to their natural biology. When social jetlag is extensive it indicates a biological challenge to that individual’s circadian and sleep systems. Roenneberg demonstrated links of social jetlag with obesity, depression, and substance abuse.

Roenneberg has continued his work demonstrating the importance of daylight on human circadian rhythms and sleep in longitudinal studies of humans living in different environments. He showed that circadian clocks resist the artificial social clock changes associated with Daylight Saving Time (DST) (which is when clock time is set by society to be one hour different from daylight time) as compared with Standard Time (ST) when social clocks and daylight are more aligned. In his recent work, Roenneberg has studied how industrialisation (with its associated changes in exposure to daylight vs artificial light) influences circadian rhythms and sleep. For this work, he studies communities in Brazil, such as the Quilombolas who live at right across the spectrum from rural life without electricity to modern urban life.

Roenneberg has received many international prizes. In 1993, he was awarded the prestigious Honma Prize (Japan) for “Outstanding contributions to the field of chronobiology”. His work on daylight was awarded with the Professional Lighting Design Recognition Award for Research and Education (2011). He was named “Ambassador for Sleep” by the German Sleep Foundation and his first book received both the Science Book Award of the British Medical Association Board (2013) and the Italian Science Book Prize (Galileo award, 2016). The University of Kent, UK recognised his innovative work with the “Innovation in Academia Award” in 2018.

In conclusion, the jury was deeply impressed by Roenneberg’s fundamental research findings, their application to help resolve real world issues and his ability to communicate this work to both scientific and public audiences. He is an exemplary scientist. With energy and enthusiasm, he applies innovative approaches to understand the importance of natural light on human health.



The Daylight Award for Architecture 2024: Alberto Campo Baeza

Alberto Campo Baeza (b. 1946) is an internationally recognised and widely published Spanish architect, who also served as a highly regarded Professor at the Escuela Technica Superior de Arquitectura de Madrid in 1986-2017. Besides, he has taught and lectured in numerous universities around the world. He is one of the most admired representatives of the contemporary minimalist orientation in architecture who has developed this line of architectural thinking most consistently, subtly, and impressively.

Jury Reasoning

His buildings are almost always brilliantly white, both in their exteriors and interiors. They can be categorised as minimalism, due to their extreme reduction of forms and other expressive means, materials, details, and even colour. There is an exception to his elimination of colour; in the Domus Aurea Building in Monterrey, Mexico, there is a huge wall of golden yellow to intensify the presence and meaning of the sun outdoors. Campo Baeza's buildings are always based on a simple, regular, rectangular, and repetitious structure, for the purpose of neutralising suggestions of movement and emphasising the presence of light. His buildings may appear as a single white rectangle in the landscape (Casa Guerrero), or a mysterious white horizontal plane with couple of penetrations by the ocean (House of the Infinite). Usually, he has eliminated materiality to maximise the impact and expressivity of natural white daylight. Even windows appear as mere rectangular openings or narrow horizontal slits cut into the walls, instead of being presented as technical devices.

Campo Baeza's buildings appear to attract daylight on their white surfaces and heighten the presence and healing power of natural light. Light seems to dwell in his white courtyards and interiors, which usually also project a sense of reduced gravity because of the absence of materiality. This utter reduction creates a spiritual or confessional air to his buildings, regardless of their functions. In addition to his numerous, almost archetypically simple, and focused houses, he has designed buildings for a multitude of other purposes, from museums to a bank, office buildings, a sports hall, and an urban square, which all share the same intention of ennobling the architectural experience through abstraction and reduction. The architect's unwavering confidence in his essential style often projects an air of silent spirituality, which is a rare, but a highly valuable alternative to today's materialist, consumerist architecture.

Campo Baeza is often seen as an "architectural miniaturist" of houses for wealthy clients, but his production is impressively wide and versatile including, for instance, the monumental Caja Granada Savings Bank. Whilst many of his buildings convey an air of lightness and thinned air, the Bank projects a cave-like massiveness and weight,



enlivened by columns of sunlight from skylights moving across the walls, gigantic columns, and monumental space.

As most of his buildings are based on a static volume, the Museum of Memory in Andalusia, with its circular geometry, is a forceful demonstration of architectural dynamics. Finally, the purified air of the UFV Sports Center even appears to ennoble sports; the border lines of various sports in their specified colours on the floor abstract it into an elegant horizontal minimalist painting. Also remembering his Mercedes-Benz Museum makes us widen the image of a "miniaturist". The Almeria Cathedral Square (in collaboration with Modesto Sanchez Morales) reveals yet another sensibility, in its severity and regularity, the urban space projects a dreamlike, poetic atmosphere.

Campo-Baeza has numerous brilliant examples of architectural light as directed and focused beams of light creating a sense of focus, drama, and significance. But the uniqueness of his architecture is to make us aware of the presence of daylight around us. Regardless of their modernity, his white buildings continue the ageless tradition of white-washed houses around the Mediterranean, reminding us of the historical fact that this formally severe white vernacular architecture inspired early modernism. Campo Baeza's buildings are usually brilliantly all-white, both in the exterior and the interiors; they appear to be sunk in white light. The whiteness makes the viewer conscious of daylight as a gift, and its seminal importance for all life on earth, as well as for human culture. Alberto Campo Baeza's architecture also makes us aware of the spiritual and symbolising qualities light.