

## About David Dinges, PhD

David F. Dinges, Ph.D. is an internationally recognized expert on excessive sleepiness and fatigue; their origins in sleep loss, disturbed sleep and circadian rhythms; their effects on human physiology, performance, health and safety; and countermeasures for these effects. He is a tenured Professor of Psychology in Psychiatry, Director of the Unit for Experimental Psychiatry, Chief of the Division of Sleep and Chronobiology in the Department of Psychiatry, and Associate Director of the Center for Sleep and Respiratory Neurobiology at the University of Pennsylvania School of Medicine. He is a member of Penn's Institute of Neurological Sciences, and a member of the Graduate Group in the Department of Psychology, College of Arts and Sciences. He also holds an appointment as Adjunct Professor in the School of Biomedical Engineering, Science and Health Systems at Drexel University in Philadelphia, Pennsylvania.

During the past 25 years, Dr. Dinges has published the results of many experiments on the physiological and neurobehavioral effects of sleep deprivation, circadian rhythm disturbance, prolonged work demands, and social isolation, on cognitive, psychological, and biological functions in humans challenged to perform at high levels. Among his accomplishments are (1) seminal experiments establishing the alertness-promoting and cognitive benefits of "prophylactic naps" as fatigue countermeasures, and the factors that influence nap physiology and benefits; (2) seminal experiments demonstrating how sleep apnea affects neurobehavioral performance, and the role of therapy in reducing these consequences; (3) some of the first epidemiological trials establishing the prevalence of sleep apnea in commercial truck drivers; studies of sleepiness and insomnia in the elderly; (4) first dose-response experiments on the nature of cumulative neurocognitive and physiological changes due to chronic sleep restriction; (5) first systematic studies of the effects of sleep loss on immune functions and inflammatory markers; (6) scientific experiments on novel uses of wake-promoting drugs on alertness and performance; (7) development of a portable technology for measuring the effects of sleep loss on attention; and (8) has also helped federal agencies set standards for evaluating technologies designed to enhance human awareness of neurobehavioral decrements, by performing the first controlled double-blind scientific studies of the validity and reliability of various drowsiness-detection technologies and alerting countermeasures.

Research currently being performed by Dr. Dinges is supported by NIH's National Institute of Nursing Research and by the National Institute on Aging; the Air Force Office of Scientific Research; the Department of Transportation; the National Aeronautics and Space Administration; and the National Space Biomedical Research Institute. Professor Dinges is currently involved in research on ways to optimize human functioning during the prolonged confinement and isolation of exploration-class space flight, such as NASA's planned mission to Mars. He currently leads the Neurobehavioral and Psychosocial Factors research team for the National Space Biomedical Research Institute, which is charged with developing scientifically-based countermeasures to prevent performance failure due to astronauts having problems adapting to the space environment as a result of neurobehavioral dysfunction. Professor Dinges also performs research for NASA and NSBRI on optimal sleep timing (duration and circadian phase) for long-duration space flight. He also works with groups at both NASA's Johnson Space Center and Ames Research Center regarding scientific approaches to optimizing high level human neurobehavioral functions in challenging environments, and he directs a center of research excellence for the Air Force Office of Scientific Research on countermeasures for jet lag and sleep deprivation.

Current research interests of Professor Dinges include the control of neurobehavioral functions by sleep and circadian processes; behavioral and pharmacological control of sleep and waking; neuroendocrine and neuroimmune functions in relation to sleep and circadian rhythms; and mathematical modeling of cumulative changes in physiological and neurobehavioral functions with chronic sleep restriction at different circadian phases. The primary focus of the research is on identifying the manner in which sleep and the endogenous circadian pacemaker interact to control wakefulness, waking neurobehavioral functions (e.g., physiological alertness/sleepiness, attention and cognitive performance, fatigue), mood, neuroendocrine profiles, neuroimmune responses, and health.