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SECRETS OF SLEEP, ORIGINS OF MASS, ORDER FROM NOWHERE, AND AN OLD WEST ARCHEOLOGIST FEATURE IN THE LATEST STIMULATING INSTALLMENT OF *NOVA scienceNOW*

NOVA scienceNOW with Host Neil deGrasse Tyson
Tuesday, July 10 at 8 pm ET on PBS
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BOSTON, MA – Did you ever wonder why "sleeping on a decision" really seems to work, or why physicists need enormous machines to study tiny particles, or who is actually leading the way when a school of fish darts one way and then another, or what archeology tells us about the settlement of the American West? Well, wonder no more—just sit back and enjoy as *NOVA scienceNOW* gets to the bottom of another batch of intriguing mysteries, on Tuesday, July 10 at 8 pm ET on PBS (check local listings).

Propelled by the irrepressible curiosity of host and astrophysicist Neil deGrasse Tyson, *NOVA scienceNOW* searches out science in surprising places. As usual, Tyson closes the program with his signature "Cosmic Perspective," showing that the big picture is sometimes the most surprising vista of all.

SLEEP & MEMORY

We spend about one-sthird of our lives sleeping. Why? Believe it or not, scientists don't know for sure. But evidence is building that sleep may play a crucial role in strengthening memories and facilitating learning, not just in humans but in most animals. NOVA scienceNOW visits research labs at the University of Pennsylvania and MIT, where scientists are peering into the brains of dozing flies and rats to understand the connection between sleep and memory. And at Harvard Medical School, host Neil Tyson tests his powers of learning on a virtual ski machine and a speed typing exercise, and then catches some z's. He discovers that it's not practice that makes perfect, but practice *plus* a night of sleep!

CERN LHC

Get ready for the mother of all particle accelerators: the Large Hadron Collider (LHC) now nearing completion at CERN, the international particle physics lab headquartered in Geneva, Switzerland. Physicist and correspondent David Wark reports on the ambitious goals of this 16-mile-long circular racetrack, which is designed to smash protons together at near-light speed. The subatomic debris left over from these breakneck collisions may include the never-

more

before-detected Higgs particle. This conjectured force carrier supposedly accounts for the mass of all elementary particles. Higgs or no Higgs, physicists expect to see exciting new phenomena with LHC and maybe even types of matter never imagined.

EMERGENCE

A general commands an army, a conductor conducts an orchestra, chickens have their "pecking order"—by all appearances order is imposed from the top down. But scientists have found that order can also spring from the bottom up in a phenomenon called emergence. The seemingly coordinated movement of a school of fish or a flock of birds is not controlled by any leader; instead, it "emerges" naturally as each individual follows a few instinctual rules such as: go in the same direction as the other guy, don't get too close, and flee any predators. Emergence explains how crowds of humans pass each other smoothly in a crosswalk, and it may eventually explain such baffling questions as the cause of consciousness and the origin of life itself.

PROFILE: JULIE SCHABLITSKY

Julie Schablitsky is rewriting the history of the Old West. Last year the University of Oregon archeologist and her colleagues presented evidence that some members of the Donner family did everything *but* resort to cannibalism during their ill-fated California trek with a group of settlers in the 1840s (some of whom did taste forbidden flesh). Schablitsky is also shedding new light on one of the most poorly documented aspects of life on the frontier: the history of the thousands of Chinese laborers who built our railroads and did other backbreaking work. Written records connected with Chinese immigrants are scarce, but their history can be read from the objects Schablitsky is turning up in a Chinese settlement in Oregon. In other innovative research, she is one of the first archeologists to recover historic-period human DNA from an artifact—in this case a medical syringe that reveals clues about its several users.

NOVA scienceNOW is produced for PBS by the WGBH Science Unit at WGBH Boston. The director of the WGBH Science Unit and senior executive producer of NOVA is Paula S. Apsell; the executive producer of *NOVA scienceNOW* is Samuel Fine; Neil deGrasse Tyson is host and executive editor.

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