Prof. Stanislas Dehaene
Professor

Most important awards, prizes and academies

Fanny Emden Prize, French Academy of Sciences (1996); Jean Rostand Award for the book La Bosse des Maths (1997); James S. McDonnell Centennial Fellowship (1999); Villemot Prize, French Academy of Sciences (1999); Jean-Louis Signoret Prize, IPSEN Foundation (2001); Boehringer-Ingelheim Prize, Federation of European Neuro-science Societies (2002); Pius XI Medal of The Pontifical Academy of Sciences (2002); Grand Prix de la Fondation Louis D. de l'Institut de France (avec D. Le Bihan) (2003); Membre de l'Académie des sciences (2005); Grande médaille d'or, Association Arts-Sciences-Lettres (2007).

Summary of scientific research

Stanislas Dehaene received his training in mathematics at the Ecole Normale Supérieure in Paris, then completed a PhD in cognitive psychology with Jacques Mehler, post-doctoral studies with Michael Posner, as well as neuronal modelling studies with Jean-Pierre Changeux. He has been working since 1997 at the Orsay brain imaging center near Paris (Service Hospitalier Frédéric Joliot of the Commissariat à l'Energie Atomique), where he has directed the Cognitive Neuroimaging Unit since 2001. In September 2005 he was elected full professor of the newly created chair of Experimental Cognitive Psychology at the Collège de France in Paris. Stanislas Dehaene's interests concern the cerebral bases of specifically human cognitive functions such as

language, calculation, and reasoning. The team uses a variety of experimental methods, including mental chronometry in normal subjects, cognitive analyses of brain-lesioned patients, and brain-imaging studies with positron emission tomography, functional magnetic resonance imaging, and high-density recordings of event-related potentials. Formal models of minimal neuronal networks are also devised and simulated in an attempt to throw some links between molecular, physiological, imaging, and behavioural data. Stanislas Dehaene's main scientific contributions include the study of the organization of the cerebral system for number processing. Using converging evidence from PET, ERPs, fMRI, and brain lesions, Stanislas Dehaene demonstrated the central role played by a region of the intraparietal sulcus in understanding quantities and arithmetic (the number sense). He was also the first to demonstrate that subliminal presentations of words can yield detectable cortical activations in fMRI, and has used these data to support an original theory of conscious and nonconscious processing in the human brain. With neurologist Laurent Cohen, he also studied the neural networks of reading and demonstrated the crucial role of the left occipito-temporal region in word recognition (the visual word form area).

Main publications

Articles: Dehaene-Lambertz, G., & Dehaene, S. Speed and cerebral correlates of syllable discrimination in infants, *Nature*, 370, 292-5, 1994; Dehaene, S., Naccache, L., Le Clec'h, G., Koechlin, E., Mueller, M., Dehaene-Lambertz, G., Van de Moortele, P.F., & Le Bihan, D., Imaging unconscious semantic priming, *Nature*, 395, 597-600, 1998; Dehaene, S., Le Clec'h, G., Cohen, L., Van de Moortele, E., & Le Bihan, D., Inferring behaviour from functional brain images, *Nature Neuroscience*, 1, 549-50, 1998; Dehaene, S., Kerszberg, M., & Changeux, J.P., A neuronal model of a global workspace in effortful cognitive tasks, *Proceedings of the National Academy of Sciences, USA*, 95, 14529-34, 1998; Dehaene, S., Spelke, L., Pinel, P., Stanescu, R., Tsivkin, S., Sources of mathematical thinking: behavioral and brain-imaging evidence, *Science*, 284, 970-4, 1999; Dehaene, S., Naccache, L., Cohen, L., Le Bihan, D., Mangin, J.F., Poline, J.B., & Riviere, D., Cerebral mechanisms of word masking and unconscious repetition priming, *Nature Neuroscience*, 4, 752-8, 2001; Simon, O., Mangin, J.F., Cohen, L., Bruandet, M., Pinel, P., Hennel, F., Poline, J.B., Bihan, D.L., & Dehaene, S., Topographical arrangement of hand, eye, calculation, and language related areas in the human intraparietal sulcus, *Neuron*, 33, 475-87, 2001; Dehaene-Lambertz, G., Dehaene, S., Hertz-Pannier, L., Functional neuroimaging of speech perception in infants, *Science*, 2002, 298, 2013-5; Pica, P., Lemer, C., Izard, V., Dehaene, S., Exact and approximate arithmetic in an Amazonian indigene group,*Science*, 2004, 306, 499-503; Sergent, C., Baillet, S., Dehaene, S., Timing of the brain events underlying access to consciousness during the attentional blink, *Nature Neuroscience*, 2005, 8, 1391-1400. *Books*: Dehaene, S. (Ed.) *Numerical Cognition*, Oxford, Blackwell, 1992; Dehaene, S. (Ed.) *Le cerveau en action: l'imagerie cérébrale en psychologie cognitive*, Paris, Presses Universitaires de France, 1997; Dehaene, S. *La Bosse des Maths*, Paris, Editions Odile Jacob, 1997; Dehaene, S. *The number sense*, New York, Oxford University Press, 1997; Cambridge (UK), Penguin press, 1997; Dehaene, S. (Ed.) *The cognitive neuroscience of consciousness*, Cambridge, MIT Press, 2002.