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**How a frog's neuronal wetware learns what is where in the dark**[1]

J. LEO VAN HEMMEN, Dept. of Physics, TU Munich, Germany — The clawed frog *Xenopus*, an inhabitant of South-African ponds, locates prey by detecting water waves generated by insects floundering on the water surface. It does so during night by means of 180 lateral-line organs located on its skin, which allow the frog not only to localize prey but also to determine its character. We have shown [1] how it performs both through waveform reconstruction. A key question is now how it gets the appropriate neuronal wetware. In so doing, catching time differences arising from the input on its skin is important. Spike-timing-dependent synaptic plasticity (STDP) [2], which has been experimentally demonstrated, seems to be the natural tool. The development of the frog's synaptic software appears to be "supervised" by the visual system during daytime. Here we show how supervised STDP allows a frog to learn what is where in the dark. In addition, the learning procedure is derived from a minimization principle and can be generalized to perform similar tasks elsewhere. Refs: [1] J.-M.P. Franosch, M.C. Sobotka, A. Elepfandt, and J.L. van Hemmen, Phys. Rev. Lett. 91 (2003) 158101; [2] W. Gerstner, R. Kempter, J.L. van Hemmen, and H. Wagner, Nature 383 (1996) 76.

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