Potential Speaker List
(In no particular order)

**Lawrence Cohen,** Professor of Cellular and Molecular Biology, Yale University (lab website: http://info.med.yale.edu/cmphysiol/cohen/redshirtdiaries.html).
Dr. Cohen's early 1973 papers in *Physiological Review* described the structural changes associated with neuronal activity. These changes are thought to be the basis for multiple optical neuroimaging techniques (including non-invasive measures of ms-scale activity in humans). As described in more detail on his website, Larry's lab currently uses voltage- and calcium-sensitive dyes to measure activity from one to about 10,000 neurons, studying things like processing modules in visual cortex, sensory-related synchronization and oscillation patterns, and convergence of receptor neurons on olfactory glomeruli. There are several things which make him an appealing candidate for an NSP speaker: (1) He has nearly 40 years of experience with a research method that is still considered cutting-edge, (2) he uses vertebrates and invertebrates to study several sensory systems, (3) it appears that he is actually still involved in collecting data!

**Gordon Winocur,** Senior scientist, Rotman Research Institute, Toronto (Canada)
http://www.rotman-baycrest.on.ca/rotmansite/profiles.php?id=72
Current projects investigate the pattern of memory loss in an amnesic patient with discrete thalamic lesions; structural brain changes that correlate with cognitive decline between middle and old age; the importance of frontal lobes in certain forms of unconscious implicit memory, neural mechanisms underlying the beneficial effects of glucose on memory function in old age, and the cognitive profile of transgenic mice carrying genetic abnormalities associated with Alzheimer's disease.

**Leonard E. Jarrard**, Washington and Lee University, Lexington, VA.
Sorry, no website, but if you type his name in PubMed (jarrard le) you will find some of his references. He works on the hippocampal formation.

**Jane E. Johnson,** Associate Professor, Chair, Neuroscience Graduate Program, University of Texas Southwestern Medical Center
Her research is focused on vertebrate nervous system development during the transition from a proliferating neural precursor to a differentiating neuron. These studies involve understanding the role of the neural specific bHLH transcription factors in this process, and how their expression is regulated by different signaling pathways.
http://www8.utsouthwestern.edu/utsw/cda/dept120915/files/150735.html
http://www.utsouthwestern.edu/findfac/contact/0,2359,13612,00.html

**Tatjana Piotrowski**, Assistant Professor of Neurobiology and Anatomy, University of Utah.
Dr. Piotrowski is studying how the sensory lateral line develops in zebrafish by analyzing mutants that affect this process. It consists of hair cells, which functionally and morphologically are very similar to the hair cells of the inner ear of higher vertebrates. In fish, the lateral line and the ear serve to detect vibrational signals (including sounds), which helps the animal to orient itself in the environment. Because of the similarity of structure and function of the hair cells in the ear and lateral line, it is likely that their development is based on similar genetic mechanisms. A key difference between these two sensory systems is that unlike the hair cells of the inner ear, the hair cells of the lateral line system are directly exposed to the environment. This property makes this system well-suited for the study of cell

migration, cell proliferation, pattern formation, and for the direct application of functional, and electrophysiological assays.
http://www.neuroscience.med.utah.edu/Faculty/Piotrowski.html

**James W. Truman**, Professor, Department of Biology, University of Washington.
His laboratory is interested in mechanisms by which circulating hormones control the development and functioning of the nervous system. He uses two insects in this research, the moth, Manduca sexta, for cellular and biochemical studies, and Drosophila for molecular genetic work.
http://depts.washington.edu/behneuro/faculty/truman.shtml

**Janis Weeks**, Professor, Department of Biology, University of Oregon Institute of Neuroscience.
The major focus of her research is to understand how hormones influence the structure and function of individual neurons, from the molecular to the behavioral level. She investigates this issue in the hawkmoth, *Manduca sexta* (the "white rat of insect endocrinology"), which transforms from caterpillar to pupa to moth in about 6 weeks. More recently, she has expanded her work to include the fruit fly, *Drosophila melanogaster* , which offers molecular genetic tools. Insect metamorphosis is controlled by steroid hormones, which alter gene expression in target cells. In response to hormonal cues, individual neurons may exhibit dendritic or axonal growth, dendritic or axonal regression and/or programmed cell death (PCD). These effects underlie the reorganization of neural circuits that produce different behaviors in the different life stages.
http://www.neuro.uoregon.edu/ionmain/htdocs/faculty/weeks.html

**Chi-Bin Chien**, Utah Medical School
Imagine trying to find your way from the University to downtown Salt Lake on foot, using only short-range senses (smell, touch, and taste, eyes closed). This gives an idea of the task faced by a growing axon in the developing brain. The growing tip of the axon, the growth cone, has to navigate a long way across complex terrain in order to connect up with its target neurons. Nevertheless, axons somehow find their way with incredible precision, allowing the developing embryo to build itself a functioning nervous system. My lab studies the genes and cell behaviors that underlie axon guidance.
http://www.neuroscience.med.utah.edu/Faculty/Chien.html
http://www.neuro.utah.edu/people/faculty/chien.php

**Mary Halloran,** Wisconsin-Madison
Her research is aimed at understanding how axons are guided to their targets during development of the nervous system. Several families of molecules have been identified that can act as axon guidance molecules by either attracting or repelling the motile growth cone at the tip of the growing axon. She is studying one class of molecules, called semaphorins. The semaphorin gene family is very large and diverse, and is highly conserved from invertebrates to humans. To date little is known about how most family members function *in vivo* to affect growth cone motility and guide the direction of axon growth.
http://www.genetics.wisc.edu/faculty/profile.php?id=123

**Eric I. Knudsen**, Stanford University
He studies the mechanisms of attention, learning and strategies of information processing in the central auditory system of developing and adult barn owls, using neurophysiological, pharmacological, anatomical and behavioral techniques. Studies focus on the process of sound localization. Sound localization is shaped powerfully by an animal's auditory and visual experience. Experiments are being conducted to elucidate developmental influences, extent and time course of this learning process, and

its dependence on visual feedback. The cellular mechanisms that underlie this example of learning are being studied to determine how experience adaptively alters the anatomical, pharmacological and functional properties of the brain in developing and adult animals. In addition, we study mechanisms of attention (gain control of sensory responses) and the rules by which auditory and visual information is combined into a single representation in the brain. Techniques offered in this laboratory include acoustic stimulation, extracellular recording, microstimulation, neuropharmacology, immunohistochemistry, anatomical pathway tracing, and behavioral analysis.
http://med.stanford.edu/profiles/Eric_Knudsen/

**Michael Meaney**, McGill University.
http://www.neurology.mcgill.ca/meaney_m.html
Early environmental regulation of gene expression and brain development: how does early experience exert a sustained influence on neuronal function?; development of individual differences in behavioural and endocrine responses to stress; environmental and neuroendocrine mechanisms influencing maternal behaviour.

**Bill Carlezon**, Harvard.
The Behavioral Genetics Laboratory (BGL) is a multidisciplinary, preclinical research program that explores in animals how genes affect complex motivated behaviors. They are particularly interested in how experiences such as exposure to psychotropic drugs (including illicit substances and clinically-prescribed treatments such as methylphenidate or antidepressants) or stress affect gene expression within the mesolimbic system (ventral tegmental area, nucleus accumbens) and cortical structures (frontal cortex, amygdala). They study how these molecular adaptations lead to alterations in motivated (reward- or aversion-driven) behaviors.
http://www.mclean.harvard.edu/about/bios/detail.php?username=bcarlezon