Abstract: The marriage of two vibrant fields—photonics and neuromorphic processing—is fundamentally enabled by the strong analogies within the underlying physics between the dynamics of biological neurons and lasers, both of which can be understood within the framework of nonlinear dynamical systems theory. Whereas neuromorphic engineering exploits the biophysics of neuronal computation algorithms to provide a wide range of computing and signal processing applications, photonics offer an alternative approach to neuromorphic systems by exploiting the high speed, high bandwidth, and low crosstalk available to photonic interconnects. This could potentially grant the capacity for complex, ultrafast categorization and decision-making with applications to brain-machine or neural interface systems and cognitive processing of the RF spectrum. I will highlight some recent progress on this emerging and exciting field.

Bio: Bhavin Shastri is a Banting Fellow at Princeton University in Prof. Paul Prucnal's lab. He received his Ph.D. in electrical engineering from McGill University, Montreal, Canada, in 2012. His research interests include: dynamical light-matter brain-inspired computing; excitable lasers and low-dimensional nanomaterials for spike information processing; ultrafast cognitive computing; machine learning and computer vision; and high-speed RF (burst-mode) circuits. He is a recipient of the Banting Postdoctoral Fellowship from the Government of Canada, the 2012 D. W. Ambridge Prize for the top graduating Ph.D. student, nomination for the 2012 Canadian Governor General’s Gold Medal, and an IEEE Photonics Society 2011 Graduate Student Fellowship, including the Best Student Paper Awards at the 2010 IEEE Midwest Symposium on Circuits and Systems (MWSCAS), the 2004 IEEE Computer Society Lance Stafford Larson Outstanding Student Award, and the 2003 IEEE Canada Life Member Award.

Thursday, February 26, 2015
3:00 pm
Latrobe 120
Refreshments will be served at 2:45

Invited by the Faculty Search Committee

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