# *BIOENGINEERING*
## *Faculty Candidate Seminar*

**Date:** **Thursday, February 4, 2021**
**Time:** **12:00 pm - 1:00pm**
**Location:** **Virtual**

Join Zoom Meeting:

Meeting ID: 988 0549 4005 Passcode: 454698

# Chris Rodgers, Ph.D.

**Biography:** Dr. Chris Rodgers is a neuroscientist, data scientist, and neuroengineer. Broadly, his research asks how cognition arises from computations in the brain. In his undergraduate thesis in Electrical Engineering at McGill University, he used concepts from signal processing to understand the theoretical limits on the fidelity of neuronal communication. For his PhD work at Berkeley, he showed how activity in the auditory and prefrontal cortex enables rats to pay attention to one sound while ignoring others. More recently, at Columbia he has used theoretical modeling, machine learning, and neural recordings to reveal the algorithms and task-specific cortical processing of tactile object recognition. His future research program builds upon this foundation to probe how a network of brain regions directs movement, perception, and learning during free behavior. His goal is to understand how computations in the brain permit natural behavior and confer resilience to disorder and disease.

**Title:** Sensorimotor strategies and neuronal representations for shape recognition

**Abstract:** Animals have evolved sophisticated abilities to recognize objects, such as landmarks around food sources. To understand the strategies and computations that mediate this ability, I developed a new behavioral paradigm that challenged mice to discriminate concave from convex shapes using their whiskers. I tracked every contact made by the whiskers with machine learning and found that the mice relied on a computational strategy of comparing input across whiskers. In parallel, I recorded large populations of neurons in somatosensory cortex and found that they reconfigured their tuning to support this computation. This demonstrates how the cortex links low-level representations of sensory input to high-level representations of object form, the essential computation of shape recognition.