

## Odor Navigation, Explosives Detection, and Toilet Aerosol Plumes: Fluid Mechanics Research in Neuroscience, Homeland Security, and Public Health

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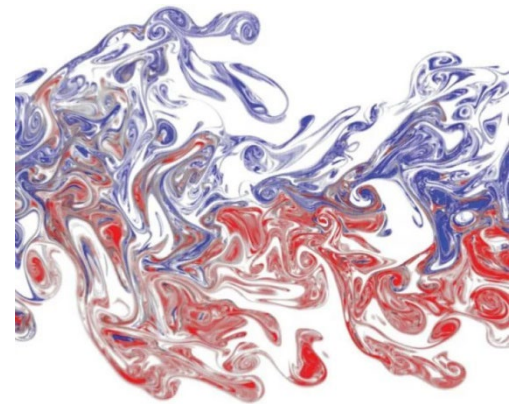
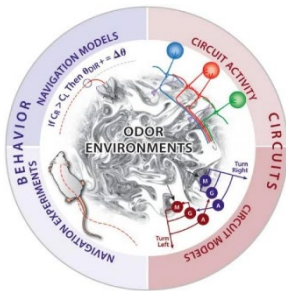
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**Zoom: <https://cuboulder.zoom.us/j/95668504496>**

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### Abstract:

In this talk I will summarize current research activities in the Ecological Fluid Dynamics laboratory at the University of Colorado Boulder; these projects span a broad range of fields including neuroscience and brain function, homeland security, and public health. Our lab is working as part of an international network of scientists to understand how odors are transported through the environment, how animals actively sense these odors, and how the brain encodes and processes olfactory information to make behavioral responses. We are also studying the transport of explosive odors, working to understand how to detect explosives hidden in passenger vehicles, and optimize training protocols for military working dogs screening cars at military checkpoints. Finally, I will describe a recent collaboration where we are quantifying the growth and spread of aerosol plumes emanating from flushing commercial toilets. These plumes are potential vectors for the spread of a range of enteric and respiratory pathogens. The talk will highlight a range of experimental and numerical methodologies used to understand the physics governing the transport and dispersion of odors, explosive plumes, and pathogen-laden aerosols.



**Speaker Bios:** Dr. Crimaldi is professor of Civil, Environmental, & Architectural Engineering at CU Boulder. His research focuses on interactions between fluid physics and ecological or biological processes. He has a particular interest in how chemicals, odors, and biological entities are transported by complex and turbulent fluid flows in air and water. Crimaldi is lead PI for the Odor2Action Network, a large international team of scientists studying how odor plumes and olfaction lead to naturalistic behavioral responses in animals.