Sensor networks are poised to affect our societies in dramatic ways. They are embedded into products we use each day, such as airbags, hearing aids, and networked cell phone systems. Sensors are tiny devices that collect information. When connected to a larger network, they manage vast amounts of data. Managing that data so we don't drown in it requires answers from mathematics.

Sensor networks monitor environmental changes in rain forests and are used in nanotechnology and biomedical testing. They are widely used in law enforcement and in homeland security. "These networks are changing our lives and our social rules," Ghrist says. "And the impacts we are seeing today are incomparable to changes that are coming." He will describe a recent calculus for sensor network data, whose origins lie in algebraic topology.