Situational Awareness…in a Box

We already have warning systems in place for severe weather events, and researchers are working on ways to alert us to an imminent earthquake. But what about a dangerously smoggy day? Or a not-yet-visible brush fire billowing toxic smoke? These sorts of hazardous environmental situations may not become apparent until they've already done significant damage.

To make sure we're not caught unawares by some stealthy environmental hazard, senior Sandra Fang spent her Summer Undergraduate Research Fellowship (SURF) in 2012 working with computational scientist Julian Bunn to build a prototype device that monitors hazards such as radiation, air pollution, and carbon monoxide and other noxious gases that may seep indoors. "It's sort of a glorified weather station," Bunn says of the device, which consists of a dozen or so sensors inside a clear box about six inches on each side.

Judy Mou (BS '13)—then a senior at Caltech—created an accompanying app for Android devices that displays the sensor's readings and issues a warning if any anomalies are detected—for example if carbon monoxide levels become dangerous. The app also feeds in news and information to keep the user even more aware of potential emergencies—such as a fire or an explosion at a nearby oil refinery. Fang has already tested the device—called a situational awareness box—and shown that it works. The next step, Bunn says, is to commercialize it using funding from investors or, perhaps, a Kickstarter campaign. —*MW*