Fanning flames

This photo shows the ceiling of a 2.4-meter-wide bathroom in a four-bedroom house a few hours after research engineer Matt DiDomizio and his team at the Underwriters Laboratories' Fire Safety Research Institute started a fire in the house's living room, about 10 meters away from the bathroom. The blaze rapidly grew and developed to such an intensity that the heated air, which was unable to easily pass through the nearby closed bathroom door, entered the HVAC system, which was off during the test.

The sooty air that rushed through the bathroom's ceiling vent plunged toward the floor before rising back up. The hot air deposited solid soot particles on the ceiling in a pattern of lighter and darker bands. The dark circular spots are from soot collecting in water vapor that condensed on the ceiling. The light–dark pattern stems from unstable convection, in which a colder fluid—here, air cooled by the ceiling—is partly blocked from descending by hotter fluid below. (Courtesy of Steven Marino.) —AL