

# Citizen Science Exploring the Microbial Hot Spring in Your Basement



*Thermus scotoductus* isolated from domestic hot water in West Virginia.  
Image source: Zhidan Zhang / Penn State

Wilpieszski, R. L. et al. (2019).  
*Extremophiles*.

**BACKGROUND:** In 1969, Brock and Freeze reported the first thermophilic isolate from Yellowstone National Park. Following that landmark paper, *Thermus* has been found worldwide including in domestic and industrial water heaters.

**THE RESEARCH:** Through an NAI-funded **citizen science** approach utilizing the expanse of the Space Grant Program, domestic hot water from all 50 states, D.C., and Puerto Rico were sampled for active thermophiles and DNA molecules. From these samples, there was evidence of thermophilic microbial groups in about half of the homes. Unexpectedly, a single species, *Thermus scotoductus*, was the dominate species of *Thermus* found in all of those case, even in locations near natural hot springs that host other similar but distinct strains.

**TAKE-HOME:** U.S. homes are a small but measurable habitat for thermophilic microbes. Rather than local environmental microbes, the home's water heater is often inhabited by *Thermus scotoductus*, which appears to be particular well adapted to this living in human built thermal environments.