Under direction of Dan Lewis, the FCHRL at Rensselaer is focused on the science and engineering of fuel cell materials. Our research team can synthesize and test new materials in fuel cells and stacks and perform both in-situ electrochemical testing and post-mortem analysis of fuel cell performance. Solid oxide fuel cell (SOFC) energy conversion science is well established, however, many technological challenges remain. The Lewis research group studies phase and morphological stability in SOFC materials with an emphasis on degradation modes in SOFC systems. We apply our expertise in materials characterization and computational materials science to understand and isolate degradation modes in fuel cells and apply this knowledge to reduce or eliminate specific degradation modes and simultaneously develop accelerated testing methodologies.