Ngee Sing Chong
Chemistry
Distinguished Research Award

Ngee Sing Chong is a professor of Chemistry and director of the MTSU Interdisciplinary Microanalysis and Imaging Center. After receiving a PhD in Chemistry from the University of Georgia in 1991, he worked for the Texas Commission on Environmental Quality monitoring air pollutants at various industrial sites in Texas. From 2004 to 2008 he served on the Tennessee Air Pollution Control Board to address air quality issues in Tennessee and helped formulate strategies for pollution control. He teaches general chemistry, instrumental analysis, intermediate analytical chemistry, vibrational spectroscopy, and atmospheric chemistry. Dr. Chong has provided research mentoring to students from high school to doctorate levels on projects funded by MTSU, the American Chemical Society’s Project Seed, the National Science Foundation, Environmental Protection Agency, United States Department of Energy, McNair Scholars Program, and Tennessee Louis Stokes Alliance for Minority Participation.

Dr. Chong has conducted research in analytical methods development, materials synthesis and characterization, and production of biomass-derived fuels. His current research is focused on the study of gas phase chemistry that plays a role in atmospheric pollution and removal of toxic and malodorous chemicals in the environment. His main contribution in the field of analytical chemistry is the development of a prototype instrument combining gas chromatography with inductively coupled plasma-mass spectrometry (GC-ICP-MS). This technique allows the quantitative analysis of toxic compounds like methyl mercury, tributyltin, and dimethyl arsine that may be found in contaminated seafood. Various methods based on GC-ICP-MS have been used by industrial laboratories, government research institutes, and academic research groups. Dr. Chong’s research group has recently discovered that surface-enhanced Raman scattering (SERS) can be used for trace analysis of aromatic amines, many of which are carcinogenic and may be generated as waste products of dyes used in textile and leather industries. In 2009-2010, Dr. Chong hosted a Fulbright Scholar from Pakistan’s Leather Research Institute in studying the feasibility of implementing the SERS technique in his home country to monitor toxic amines released from leather manufactures. He is currently collaborating with researchers at the Shelby County Health Department and University of Memphis in the air quality study of Memphis and the surrounding areas. The results indicate that there are several chlorinated and fluorinated compounds detected that are not in the EPA’s toxic release inventory list and yet may be significant from the standpoint of risk assessment.