From Spectroscopy to Aerogels: A Professional Journey

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Immediate Past President, American Chemical Society

Chemistry Colloquium on *The application of Aerogels*

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Abstract: How did a chemist with a background in development of optical instrumentation for fundamental molecular luminescence spectroscopic studies and sensing end up working with aerogel materials? Aerogels are solid materials with simply remarkable properties, including unusually high surface area, low density, and low thermal conductivity. These properties make aerogels useful in a wide variety of areas, from insulation to sensing, and from art to catalysis. In this presentation, I will describe my professional journey, provide an overview of how aerogel materials are made, and highlight some applications of aerogels. In the Union College Aerogel Lab, an interdisciplinary team of undergraduate students and faculty members is focusing on development of aerogel materials for sustainable building and pollution mitigation. Throughout the talk, I'll provide reflections on how mentoring, networking, and ACS programs have impacted my career, and how they can help advance yours!

About the speaker: **Mary K. Carroll** is the Dwane W. Crichton Professor of Chemistry at Union College (Schenectady, NY) and the Immediate Past President of the American Chemical Society.

Prof. Carroll earned a BS in chemistry from Union College, a PhD in analytical chemistry from Indiana University, Bloomington, and performed postdoctoral research at the University of Massachusetts, Amherst. At Union College, she teaches courses in general chemistry, analytical chemistry, chemical instrumentation, team-teaches a course in the art and science of painting, and mentors undergraduate research students. She co-directs the Union College Aerogel Lab, a vibrant and productive interdisciplinary research group, with Professor Ann Anderson of Union's Mechanical Engineering Department. To date, more than 180 undergraduate students and more than a dozen high-school students have participated in aerogel research at Union. In addition to fundamental studies, the group investigates applications of aerogels in sustainable buildings, chemical sensing, drag reduction, and automotive pollution mitigation. Professor Carroll co-founded SunThru LLC to commercialize aerogel technology developed at Union.

A member of ACS since 1986 and an ACS volunteer leader since 1993, Prof. Carroll served as Councilor of the ENY ACS section from 1998-2022, representing the section at Council meetings and participating in ENY Executive Committee meetings. At the national level, she has served on the ACS Committee on Science (COMSCI), the ACS Leadership Advisory Board (LAB) and served and held leadership positions on the ACS Council Policy Committee (CPC), the ACS Society Committee on Education (SOCED), the ACS Women Chemists Committee (WCC), and numerous working groups and task forces. She was elected to a three-year term in the ACS presidential succession in fall 2022 and served as the 2024 ACS President.

Based on her contributions to science and service to the ACS, Professor Carroll was selected for recognition as a member of the class of 2016 ACS Fellows. At Union College, she has received the Stillman Prize for Excellence in Teaching, the Faculty Meritorious Service Award and, with Professor Anderson, the Stillman Prize for Faculty Excellence in Research.