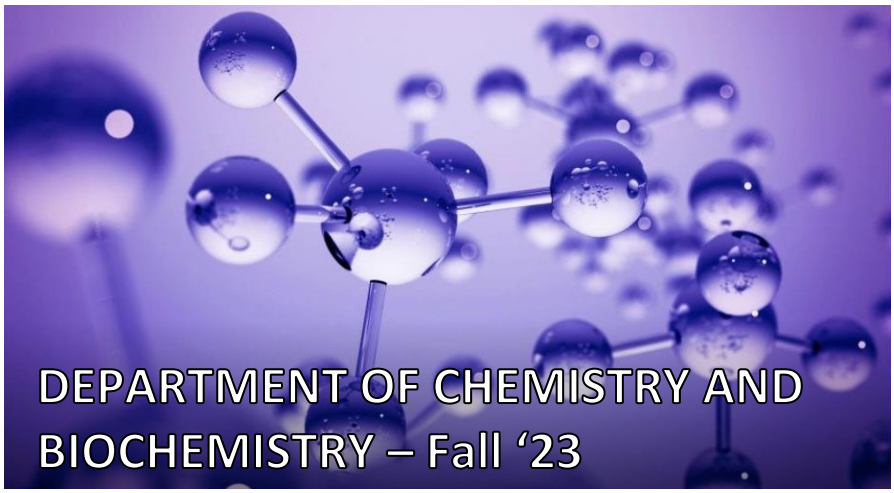
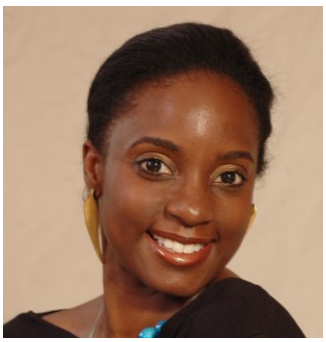



# THE SALZBERG CHEMISTRY SEMINAR SERIES

The City College of New York

CREST IDEALS PHASE II

**Monday, November 20, 2023 @ 12:00 noon – MR1027**



## How an Interest in π-systems Led to a Career in Quantum and Quantum in three Dimensions

**Tina Brower-Thomas**
Center for Integrated Quantum Materials
Howard University

**Abstract:** Self-assembled conjugated π-systems, such as aromatic thiols, on gold substrates buoyed the field of molecular electronics and offered a unique solution to some of the challenges faced by the semiconductor industry. Another π-system that holds even a greater promise is graphene, a single atom thick layer of carbon atoms. In fact, the impact of the successful exfoliation of graphene from bulk graphite has left an indelible mark on several fields, including condensed matter physics, chemistry, and materials science. Although graphene possesses some promising properties, such as high mobility and high thermal conductivity, graphene's lack of a bandgap and magnetic properties has impeded its use in a variety of industrial applications, including electronics and spintronics. My group aims to functionalize graphene, improving graphene's function without fundamentally affecting its desirable properties. Although theoretical reports of graphene's interaction with transition metal (TM) and alkali ions (AI) show a retention of graphene's properties upon the adsorption of these atoms, experimental approaches are needed to substantiate these theoretical works. Motivated by a lack of comprehensive experimental work in this field, we have been investigating the interaction of TM and AI with the surface of graphene using chemical and electrochemical reactions. Finally, I am setting up a microwave plasma chemical vapor deposition system that will be coupled to x-ray diffraction at the Brookhaven National Laboratory Synchrotron Source for in-situ x-ray growth studies of diamond growth. In addition to discussing our work in the field, we will also discuss our contributions in quantum education and work force development.

**Biography:** Tina Louise Brower-Thomas received a BS in chemistry from Howard University and a MS of chemistry and PhD in materials chemistry from the New York University Tandon School of Engineering. After completing a National Research Council postdoctoral fellowship at the Naval Research Lab, Surface and Microanalysis Division, Center for Biomolecular Science and Engineering, Tina consulted in the support of missions of The Defense Advanced Research Projects Agency (DARPA) and The Department of Homeland Security (DHS). Tina joined academia when she returned to Howard University in 2007. Her roles at Howard include assistant director for the integration of research in education and adjunct professor teaching courses in nanoscience and nanotechnology in the department of chemical engineering. Currently Tina is a research professor in the graduate school. Her research focus includes molecular self-assembly, surface functionalization, chemical vapor deposition, and chemical intercalation of 2D materials. In addition to being research faculty in the graduate school at Howard University, she holds a visiting faculty appointment at Harvard University. Dr. Brower-Thomas serves as Co-PI for the NSF funded Center of Integrated Quantum Materials (CIQM) and the Center's executive director at Howard. She is CIQMs education director and investigator in the 2D heterostructure research area Dr. Brower-Thomas is the Co-PI at Howard for The Center for Quantum Networks and supports research thrust 3: Quantum Devices, Materials, and Fundamentals. Dr. Brower-Thomas is also an investigator for the Co-design Center for Quantum Advantage (C2QA), supporting materials thrust. She is a volunteer on C2QA's work force development board. Tina Brower-Thomas has recently received funding from the Department of Defense to build two microwave diamond chemical vapor deposition growth systems for diamond growth. The funding will support collaborations with Brookhaven National Labs (BNL). A growth system will sit at the ISR Beamline for in-situ studies of diamond growth.

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