CHEMISTRY OF MATERIALS

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Editorial

Tribute to Dong Qin

Cite This: *Chem. Mater.* 2024, 36, 2599−2601

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It was with profound sadness that we learned of the passing of our friend and colleague Dong Qin. Dong was a Professor of Materials Science and Engineering at the Georgia Institute of Technology, with an adjunct appointment in the School of Chemistry & Biochemistry. She was an incredibly positive and caring person, as well as an excellent researcher, mentor, and teacher. Dong had a diverse career in science and made significant contributions to many different topics (see, nanodq.com). She received her B.Sc. in Chemistry from Fudan University in 1990 and a Ph.D. in Physical Chemistry with Hai-Lung Dai at the University of Pennsylvania in 1996 where she studied the energy relaxation kinetics of highly excited molecules in the gas phase. After completing her Ph.D., Dong took a postdoctoral research position with George M. Whitesides at Harvard University (1996−1997) where she worked on soft lithography and rapid prototyping methods. Before joining Georgia Tech in 2012, she held administrative positions as Associate Dean of Research in the School of Engineering and Applied Science at Washington University in St. Louis (2007−2011) and Associate Director of the Center for Nanotechnology at the University of Washington (1998−2007). She also completed an MBA from the University of Washington in 2003.

At Georgia Tech, Dong established a vibrant group working on the colloidal synthesis of noble-metal nanocrystals having complex but well-controlled compositions and structures, with an ultimate goal to elucidate the mechanistic details for the rational production of novel materials with designer properties for an array of applications.[1−4] In one example, her group successfully demonstrated the ability to deposit a less reactive metal on the surface of silver nanocrystals for the fabrication of bimetallic systems with a core−frame or core−shell structure by introducing a faster parallel reaction to compete with and thus suppress the galvanic replacement reaction.[5−12] Dong also pioneered a set of *in situ* techniques based on surface-enhanced Raman spectroscopy (SERS) for the characterization of atomic/molecular events on the surface of noble-metal nanocrystals in a liquid phase and under operando conditions.[13−16] To this end, her group developed a set of isocyanide-based SERS probes to investigate the heterogeneous nucleation and growth of a second metal such as palladium and platinum on the edges of silver nanocubes. They demonstrated the capability to detect as few as 27 platinum atoms being deposited onto the edge of a 40 nm silver nanocube. This research not only greatly advances our understanding of the nucleation and growth of bimetallic nanocrystals but also paves the way for rational and deterministic synthesis of nanomaterials with desired and controlled properties. Lastly, Dong extensively investigated the use of bimetallic nanocrystals as a bifunctional probe with integrated catalytic and plasmonic activities for catalyzing stepwise reactions while reporting on the intermediate species in real time through *in situ* SERS.[17−20] Figure 1 shows some examples of the beautiful materials that the Qin group was able to produce and applications of these materials to *in situ* studies of catalysis.

Dong was elected as a Fellow of the Royal Society of Chemistry (FRSC) in 2021 in recognition of her research contributions to nanoscience. She served as an Associate Editor of *Nanoscale* and *Nanoscale Advances* (2020−2023), as well as an advisory board member of *Nanoscale Horizon*, *Journal of Materials Chemistry C*, and *ChemNanoMat*. She was also a recipient of multiple Teaching Excellence Awards from Georgia Tech. Dong is survived by Younan Xia (spouse), Qike Zheng (mother), and Fawn Wang (sister) and was preceded in death by her father Qizong Qin. Dong's kindness and warmth touched everyone who met her. She had a tremendous enthusiasm for science that motivated her students and colleagues alike. She will be greatly missed by those of us in the physical chemistry and nanoscience communities who had the pleasure to know her.

In her honor, an endowed fund has been created at the American Chemical Society (ACS) to establish and support

Published: March 26, 2024

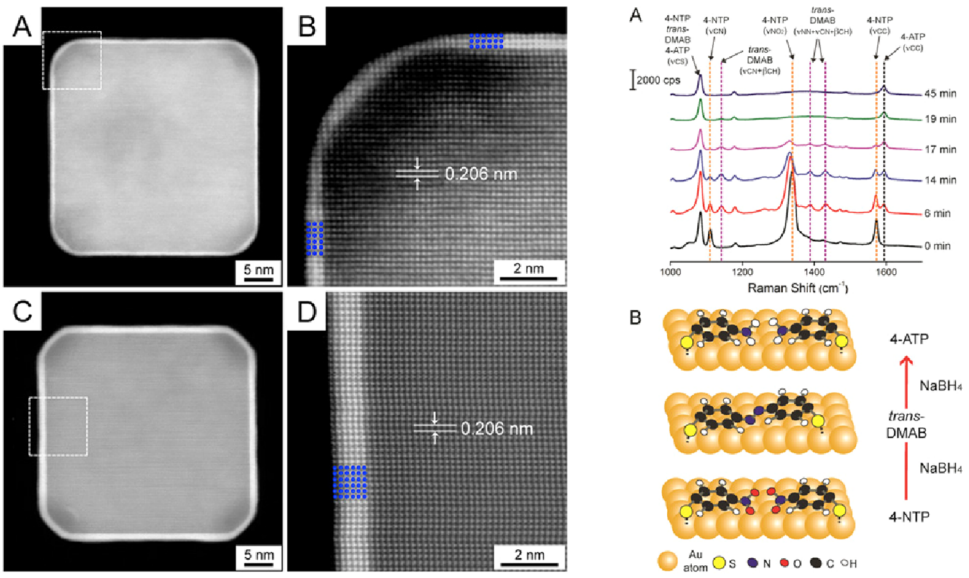

Figure 1. Left: HAADF-STEM images taken from two samples of silver nanocubes with three (A, B) or six (C, D) atomic layers of gold deposited on the surface. Reprinted with permission from ref 5. Copyright 2014, American Chemical Society. Right: (A) SERS spectra showing the reduction of 4-nitrothiophenol (4-NTP) to 4-aminothiophenol (4-ATP) by $NaBH_4$ catalyzed by the Ag@Au concave cuboctahedra, with the formation of *trans*-4,4′-dimercaptoazobenzene (DMAB) as an intermediate. (B) Schematic illustration of the reaction pathway. Reprinted with permission from ref 17. Copyright 2016, American Chemical Society.

the *Dong Qin ACS Award in Nanochemistry*. This award will recognize creative and impactful research by an investigator in the area of nanochemistry, broadly defined. The inaugural award is expected to open for nominations in the Fall of 2024 and be presented at the 2026 spring national ACS meeting. Another endowed fund has also been created at the University of Pennsylvania to establish and support the *Dong Qin Distinguished Lecture in Materials or Physical Chemistry* in the Department of Chemistry. The inaugural lecture will be delivered by Professor John A. Rogers, with whom Dong collaborated during their postdoctoral training.

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This editorial is jointly published in *Chemistry of Materials* and *The Journal of Physical Chemistry C*.

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https://doi.org/10.1021/acs.chemmater.4c00414
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