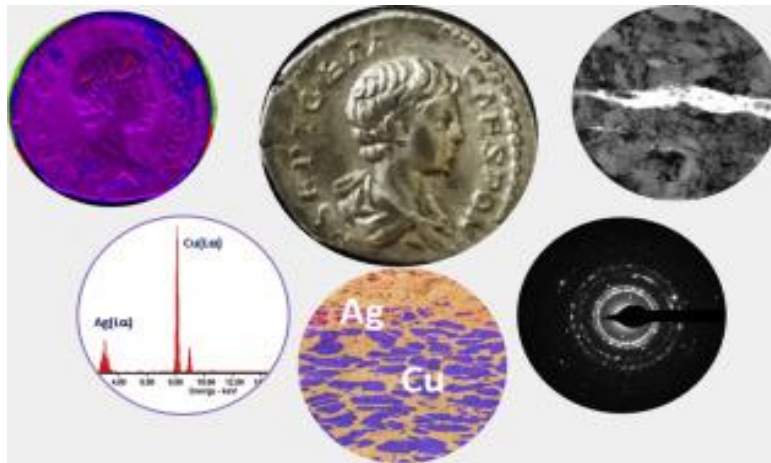


# Surface manipulation techniques of Roman Denarii



A team of researchers and undergraduate students at Notre Dame's Nuclear Science Laboratory published an article in Applied Surface Science journal on the characterization of a set of Roman denarii, ranging from 136 BCE to 240 CE. The work presents results of macro, micro, and nanoscale surface characterization of coins using several different X-ray based spectroscopic and electron microscopy methods.



This enabled the surface, the subsurface, and volume composition of these coins to be probed to better understand their production techniques, surface treatment methods, and corrosion patterns. The results also provide evidence that a particular surface treatment method, amalgam silvering, had been used to make authentic Roman coins as early as the third century CE.



K. Manukyan, et. al., Applied Surface Science 493, 2019, 818-828, <https://doi.org/10.1016/j.apsusc.2019.06.296>

