Organized gold nanoparticle architecture at the air/water interface

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New methodologies for creating ordered metal nano-and micro-patterns that might also exhibit practical applications are intensively sought. We have developed a molecular self-assembly approach for creating metalic architecture in monolayers formed at the air/water interface. Specifically, we assemble "monolayer templates" of surfactant molecules on water; hydrophobically-coated metal nanoparticles (NPs) are interspersed within these templates and adopt organized structures. The NP patterns (nano-wires, "islands", and others) can be easily transferred from the water surface onto solid surfaces; following gold seeding and surface annealing the resultant thin films could form transparent conductive electrodes, sensors, and generally constitute a promising platform for organized two dimension structures. The new technology is generic, robust, and can be implemented in varied surface areas and length scales. Representative publications:

1. "Gold Nanostructures in Diacetylene Monolayer Templates", N. Markovich, R. Volinsky, **R. Jelinek**, *JACS*, **2009**, *131*, 2430-2431.
2. "Laser-Modulated Ordering of Au Nanoparticles at the Air/Water Interface", R. Volinsky, **R. Jelinek**, *Angew. Chem. Int. Ed. Eng.,* **2009**, *48*, 4540-4542. ***Designated a Very Important Paper (VIP)***