

## Plasmonics with Unconventional Materials: Silver Amalgam and Vanadium Dioxide

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When light interacts with some artificially nanostructured materials, interesting extraordinary phenomena can emerge. In this contribution I will describe our latest attempts to fabricate and utilize new nanostructured platforms from unconventional materials for nanophotonic and plasmonic applications. More specifically, I want to speak about nano- and micro-particles made silver-mercury alloy (amalgam), which can act as versatile electrochemical electrodes while, at the same time, exhibiting surface plasmon resonances in the mid-infrared region. Then, I would like to outline several studies we conducted with nanostructured vanadium dioxide, a unique material which can undergo insulator-to-metal phase transition near ambient temperatures. This property is essential in any application where tunable or switchable optical properties are required. Finally, I would like to briefly mention the recent progress and advertise out future plans related to the construction of an optical setup for time-resolved photoluminescence in CEITEC Nano laboratories.

