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Metallic Nanoporous Films Fabricated by Etching SHILPA CHAVA, JULIA TILLES, WEI JIANG YEH, University of Idaho, PHYSICS TEAM
— Nanoporous metal films possess unique surface, structural, and bulk properties that underlie their importance in a wide range of applications such as catalysis, sensing, microfluidic control and filtration. In this presentation, we report our preliminary experimental results of metallic porous materials obtained by dealloying. The purpose of this research is to develop new strategies and techniques for the fabrication of nanoporous structures by selective chemical etching of different alloys. We have investigated two different chemical reactions: one is gold nanoporous films obtained from dissolving the silver component from the silver-gold alloy and the other is lead porous material obtained by etching out tin from lead-tin alloy. It was found that after dissolving the silver component, the remaining atoms gather together in clusters creating a rough surface, thereby causing the gold to evolve into porous material. We were able to tune the size of porous from about 10nm up to few 100 nm. When tin was etched off from lead-tin sheets, different microstructures were found by etching at different times. When it was etched for a short period of time, needle shaped structures with size of about a few 100's of nm were found. As we increased etching time, grain shaped structures were formed.

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