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**Structural Properties of Gold Thin Films Deposited on various Substrates by RF Magnetron Sputtering** MONIRUZZAMAN SYED, Lemoyne Owen College, CALEB GLASER, MICHAEL SCHELL, INDRAJITH SENEVIRATHNE, Lock Haven University — In this study, Gold (Au) thin films were deposited on glass ( $\text{SiO}_2$ ) and silicon (100) substrates at room temperature (RT) in an argon (Ar) gas environment as a function of sputtering time (Tsp). The structural properties of Au films have been studied using an Atomic Force Microscope (AFM). The results of this study indicate that the structural properties of the deposited Au film are related to the conductance of the substrate. AFM micrographs of Au films show that the films on nonconductive substrates show higher coalescence for longer sputtering times. Au films deposited on conductive silicon substrates show structures that show microvoids and to homogenous structures as the sputtering time increases. On the other hand, gold films deposited to nonconductive glass substrates showed homogenous structures that changed to cluster and island-type as a function of sputtering time.

Moniruzzaman Syed  
Lemoyne Owen College

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