John Wayne Rabalais
Distinguished Professor

Ph.D. Louisiana State University .
B.Sc. Univ. of SouthWestern Louisiana

Spectroscopy, Forensics, and Ion-Surface Interactions

Research Interests

Applications of Spectroscopic Methods in Forensics Science

Our current research interests are in the following areas: (I) application of (1) atomic force microscopy (AFM), (2) Fourier transform infrared microscopy (FTIRM), and (3) attenuated total reflectance microscopy (ATRM) to Forensic Science problems. (II) Growth and characterization of nanoparticle quantum dots, and (III) ion/atom/electron surface dynamics using experimental coincidence-correlation techniques and theoretical analysis.

Selected Publications

R. Zhang, B. Makarenko, B. Bahrim, J.W. Rabalais "Application of low energy ion blocking for adsorption site determination of Na Atoms on a Cu(111) surface" Surface Science 604, 1230-1236.

Y. Mou, J. W. Rabalais, "Detection and Identification of Explosive Particles in Fingerprints Using ATR-FTIR Spectro-microscopy", Journal of Forensic Sciences 54, 846-850 (2009).

B. Bahrim, S. Yu, B. Makarenko, J.W. Rabalais, "Electron dynamics in H-/Na/Cu(111) collisions", Surface Science 603, 703-708 (2009).

Y. Mou, J. Lakadwar, and J. W. Rabalais, "Evaluation of Shooting Distance by AFM and FTIR/ATR Analysis of GSR", Journal of Forensic Sciences 53, 1381-1386 (2008).

J. P. Zhao, D. X. Huang, Z. Y. Chen, W. K. Chu, B. Makarenkov, A. J. Jacobson, B. Bahrim, J. W. Rabalais, "Amorphous Ge Quantum Dots Embedded in SiO_2 Formed by Very Low energy Ion Implantation", Journal of Applied Physics, 103 (12), art. no. 124304 (2008).

J. P. Zhao, Y. Meng, D. X. Huang, W. K. Chu, and J. W. Rabalais, "Sn Quantum Dots Embedded in SiO_2 Formed by Low Energy Ion Implantation", Journal of Vacuum Science and Technology B 25, 796 (2007).

Recent Thesis Topics

Gayathri Kante (2009) "Analysis of fingerprint residues using attenuated total reflectance-fourier transform infrared (ATR-FTIR) spectroscopy to differentiate smokers from non-smokers"

Divya Jajula, (2008) "Differentiation of Smokers From Non Smokers by Fourier Transfor Infrared Microscopy (ATR0FTIRM) of Toe Nails".

Jyoti Lakadwar, (2007) "Analysis of Drugs in Hair by Fourier Transform Infrared Microscopy (FTIRM) and Atomic Force Microscopy (AFM)".

Ravi K. Rayabarapu, (2006) "Application of Atomic Force Microscopy (AFM) and Fourier Transform Infrared Microscopy (FTIRM) for Investigation of Gunshot Residu and Ti-Sn Alloy Nanodots".