

## New directions in hard and soft x-ray photoemission with synchrotron radiation

C.S. Fadley

Department of Physics, University of California Davis  
Materials Sciences Division, Lawrence Berkeley National  
Laboratory

I will present some new directions in soft x-ray photoemission (XPS, SXPS) and hard x-ray photoemission (HXPES, HAXPES, HIKE) [1-18]. These involve combined SXPS and HXPES studies of buried layers and interfaces in magnetic and transition-metal oxide multilayers [5,6,8,10,12], hard x-ray photoemission studies of the bulk electronic structure of some spintronic materials [4,7,11,14]; band-offset measurements in oxide and semiconductor multilayers [12,17]; the use of standing waves from multilayer mirrors to enhance depth contrast in spectroscopy [1,5(a),6,10,15,16], as well as in angle-resolved photoemission (ARPES) [1,5(b)], photoelectron microscopy [3], and multi-Torr ambient pressure photoemission [18]; and some first results for bulk sensitive hard x-ray ARPES (HARPES) [9,14,16] and hard x-ray photoelectron diffraction (HXPD) [2].

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