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Infrared studies of topological insulator systems KIRK POST, BRIAN CHAPLER, ALEX SCHAFGANS, Univ of California - San Diego, MENGKUN LIU, SUNY - Stonybrook, JIH-SHENG WU, Univ of California - San Diego, ANTHONY RICHARDELLA, JOON SUE LEE, Pennsylvania State University, ANJAN REIJNDERS, University of Toronto, YUN SANG LEE, Soongsil University, LIANG HE, XUFENG KOU, Univ of California - Los Angeles, MARIO NOVAK, ALEXEY TASKIN, KOUJI SEGAWA, Osaka University, MICHAEL GOLDFLAM, H. THEODORE STINSON, Univ of California - San Diego, XIAO LIANG QI, Stanford University, KENNETH BURCH, Boston College, KANG WANG, Univ of California - Los Angeles, MICHAEL FOGLER, Univ of California - San Diego, NITIN SAMARTH, Pennsylvania State University, YOICHI ANDO, Osaka University, DIMITRI BASOV, Univ of California - San Diego — The theoretical prediction, and subsequent experimental realization, of topological insulator (TI) systems, has vaulted this new class of materials to the vanguard of condensed matter physics. Since their discovery, we have carried out a number of infrared studies on various TI systems, including Bi_2Se_3, $Bi_{1-x}Sb_x$, and $Bi_{2-x}Sb_xTe_{3-y}Se_y$ crystals as well as Bi_2Se_3 and $(Bi,Sb)_2Te_3$ thin films. A key element of these works is the revelation that the infrared response of $Bi_{1-x}Sb_x$ crystals and $(Bi,Sb)_2Te_3$ thin films possess a significant, or even dominant, component from the topologically protected surface states. I will review these works and discuss future prospects of measuring the surface state response through optical spectroscopy techniques

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