

Abstract for an Invited Paper
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Materials for Energy Applications¹

MATT MCCLUSKEY, Washington State University

New materials that address worldwide energy needs will attract significant research effort into the foreseeable future. This talk will focus on the fundamental properties of several materials that have potential to increase energy production or reduce energy demand. One example is zinc oxide (ZnO), a wide-band-gap semiconductor that has attracted resurgent interest as an optoelectronic material. The efficiency of the emission is higher than more conventional materials such as GaN, making ZnO a strong candidate for energy-efficient white lighting. Another major advantage of ZnO is the fact that, in contrast to GaN, large single crystals can be grown. ZnO has also been used as a transparent conductor in solar cells. In general, physicists can contribute significantly to this field, by elucidating fundamental phenomena that will lead to new or improved devices.

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