UNL Department of Physics and Astronomy presents:

Synchrotron Radiation, A Dream Light, Shining Electrons in Solids

PRESENTED BY
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4:00 PM
IN JH 136

Refreshments will be served in the JH 1st Floor Vending Area at 3:30

ABSTRACT

I introduce our synchrotron radiation facility, HiSOR, on the campus of Hiroshima university [1,2] and how we use synchrotron radiation to study the electronic structure of solids such as semiconductors, metals, superconductors, magnets, and topological insulators.

Synchrotron radiation is electromagnetic radiation generated when relativistic charged particles move perpendicular to the direction of motion under a magnetic field. Synchrotron radiation is intense and covers broad wavelengths (visible light to x-ray) with controllable polarization. In addition, synchrotron radiation is a clean light source as it is generated in the ultrahigh vacuum and is well-defined because one can calculate its properties based on classical electromagnetism. Due to these advantages, synchrotron radiation is sometimes called a dream light. I use synchrotron radiation to run angle-resolved photoemission spectroscopy (ARPES) measurements to reveal the electronic states (density of states, band dispersion, Fermi surface, spin-polarization, and lifetime) in solids. The tunable wavelength helps examine the three-dimensional electronic structure in the momentum space. Furthermore, the polarization property is indispensable for selectively detecting an electronic state with a specific symmetry. I will show some ARPES results from our studies.

REFERENCES

[1] K. Shimada, Hiroshima Synchrotron Radiation Center at Hiroshima University, AAPPS Bulletin **30** (4), 36-40 (2020). http://aappsbulletin.org/cop/bbs/000000000000/selectArticleDetail.do?nttId=4351

[2] Hiroshima Synchrotron Radiation Center webpage, http://www.hsrc.hiroshima-u.ac.jp/english/index.html