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**Berry phase effects on electronic properties**[1]

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Geometric phase has found wide applications in physics, and has emerged as a unifying concept in describing and predicting electronic properties in solids. In this talk, I will review recent advances on Berry phase effects in insulators, metals, and semiconductors, with topics covering dielectric, magnetic, and transport properties. I will also discuss non-abealian generalization of the geometric phase concept and applications in spin transport.

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[2]. D. Xiao, Y. Yao, Z. Fang, and Q. Niu, Phys. Rev. Lett. **97**, 026603 (2006).;
[3]. D. Culcer, Y.G. Yao, and Q. Niu, Phys. Rev. B **72**, 085110 (2005).

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