



复旦大学物理系 物质科学报告

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Topological phases in condensed matter

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Electrons in a crystal form band structure, and their wave functions in momentum space have topological structure characterized by Berry curvature. This curvature leads to various Hall effects, and to various topological phases. In my talk we give an overview of physical phenomena from Berry curvature in momentum space. Particularly, we focus on topological semimetals, whose band structures are governed by profound interplay between topology and symmetry. We then discuss realization of such phenomena, not only in electronic systems but also in other particles..



Shuichi Murakami was born in Osaka, Japan in 1970. He graduated in Physics (1993) at the University of Tokyo. He obtained his Ph.D. (1999) degree from the University of Tokyo.

He was research associate (1995–2007) at the Department of Applied Physics, University of Tokyo. He moved to Tokyo Institute of Technology as associate professor in 2007, and became professor in the Department of Physics and in the Materials Research Center for Element Strategy in 2012.

In 2003, in collaboration with Professor N. Nagaosa and Professor S.-C. Zhang, he theoretically proposed intrinsic spin Hall effect, which has been observed experimentally later. Since then he has been working on theories of spintronics and topological phases in condensed matter physics.

He received Young Scientist Award of the Physical Society of Japan in 2007, Young Scientists Prize of the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology and Sir Martin Wood Prize in 2010, IBM Japan Science Prize in 2011, JSPS Prize in 2012, Inoue Prize for Science in 2016 and APS fellow in 2017