



复旦大学物理系物质科学报告

Finding New Electronic Materials **Physics Department Colloquium**

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“New materials give new properties” is a phrase that I think best describes the goal of our research program. We find new materials by thinking about how the chemistry and structures of materials at the level of the atoms and the unit cell might determine the electronic and magnetic properties of matter, and, although we are often wrong in our guesses, we are occasionally right and find new materials that are interesting. This process would be easier if there was a way to proceed in a straightforward fashion from predicting the stability of an unknown non-molecular solid, predicting what its properties would be, and then making and testing it, but unfortunately that is not the case. Our discussions with experimental and theoretical physicists teach us about issues in the electronic and magnetic properties of matter that might be addressed through the introduction of new materials, and our life in a chemistry department teaches us how to think about structure and

bonding; our work is about putting it all together to get new materials of interest. In this talk I will describe some of our recent results in several new materials areas, ranging from new superconductors and geometrically frustrated magnets to Topological Insulators and high magnetoresistance semimetals. Our exploratory materials research is supported by the US Department of Energy, the Gordon and Betty Moore Foundation, the Army Research Office, and the NSF, and we are very thankful to our many collaborators for their contributions.



New geometrically frustrated magnets – Jason Krizan photos

Time: 2:00pm, Tuesday, 2016.06.14

Location: Physics Building, Room 221B

(Cookies and coffee are served from 1:45 pm)