



BAMA

School Year 2009–2010
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Robert Bryant

Rolling and Tumbling—The idea of Holonomy



Santa Clara University*, Daly Science 206

Friday, November 20, 7:30 pm

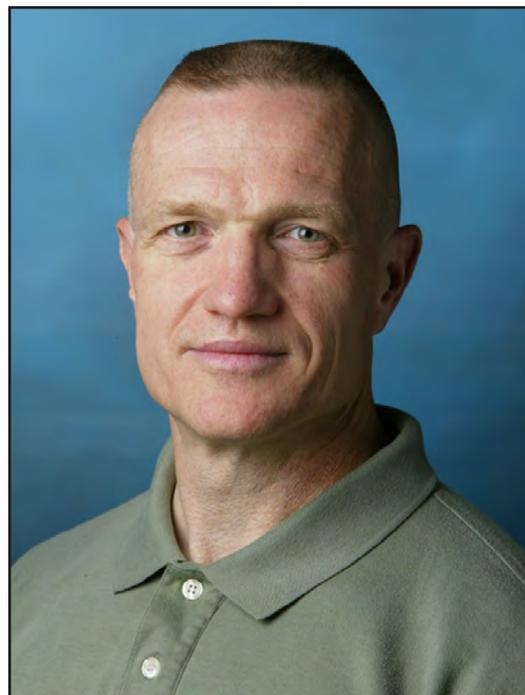
Mechanics is the branch of mathematics that describes how objects move and some of the most interesting mathematics comes about when the objects are only allowed to roll or tumble without slipping. For example, toys such as spirographs depend on rolling a circle along a track in such a way that it doesn't slip, and the resulting motion draws some beautiful designs. When you can roll or tumble in more than one direction, you can describe how one drives and parks cars or how a ball rolls over a table and many more everyday situations.

In this talk, Dr. Bryant will describe these and other situations in which mathematics can help us understand what kinds of motions are possible. It leads to important concepts, such as groups and symmetry and the fundamental notion that mathematicians call holonomy. He will illustrate these ideas with some everyday and some not-so-everyday toys.

After growing up in North Carolina, **Robert Bryant** received his PhD in mathematics from the University of North Carolina at Chapel Hill. He has taught on the faculties of Rice and Duke Universities and now serves on the faculty at UC-Berkeley in addition to being the Director of the Mathematical Sciences Research Institute.

He is a Vice-President of the American Mathematical Society and the chair of the Golden Section of the Mathematical Association of America. He is a fellow of the American Academy of Arts and Sciences and a member of the National Academy of Sciences.

He enjoys teaching and helping others understand and enjoy mathematical games and puzzles and is a recipient of the Distinguished Teaching Award of the Southeastern Section of the MAA. In his spare time, he enjoys reading, playing the piano, and rock climbing.



* See back for map and directions.

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