

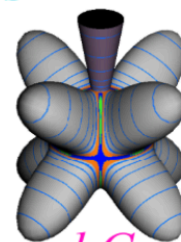
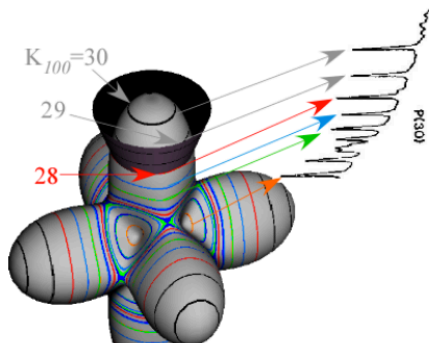
## Group Theory and Quantum Mechanics

*Exploring new methods of spectral symmetry analysis*

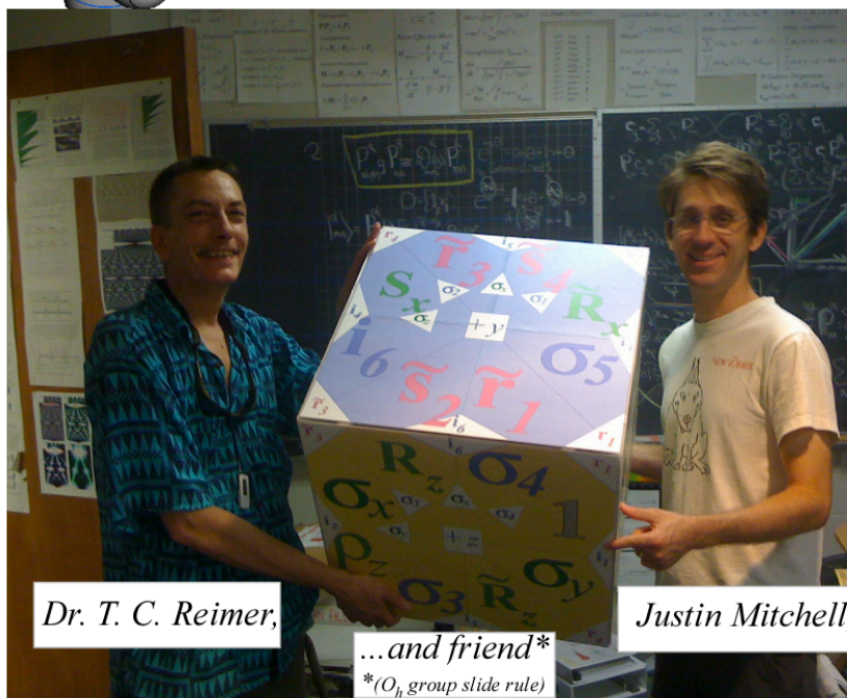
William G. Harter - Department of Physics - University of Arkansas

Website development - Dr. Tyle C. Reimer - Heyoka Consulting

Website video - Al Calabrese - UAF Micro-Electronic-Photonics



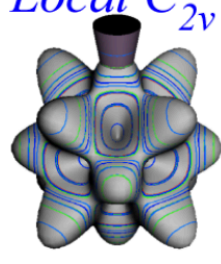
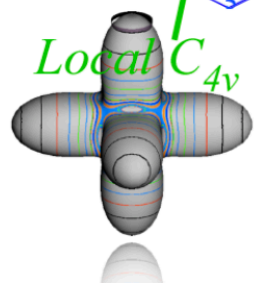
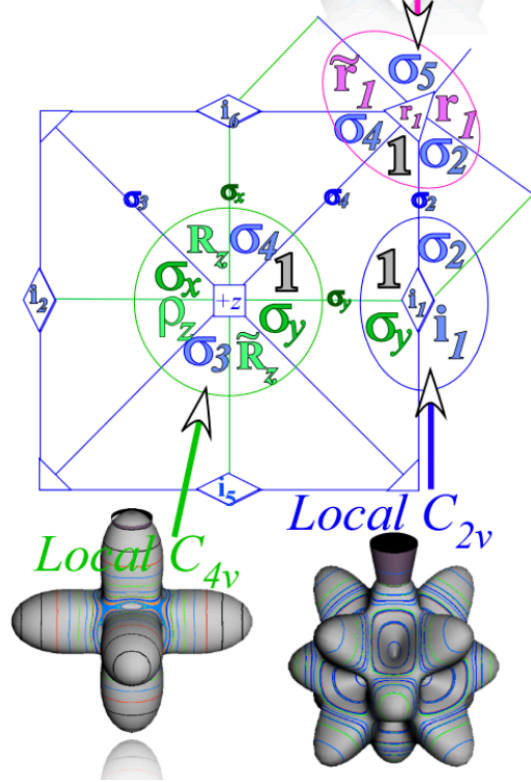
Local  $C_{3v}$



Dr. T. C. Reimer,

Justin Mitchell,

...and friend\*  
\*( $O_h$  group slide rule)



**PHYS 5093** begins with a review of QM as taught by Feynman ([Feynman Lectures - Feynman Leighton and Sands](#))

First lectures show the physics of his 4-axioms and how they are the group axioms.

([Lecture 1](#)) ([Lecture 2](#)) ... **all** 2015 lecture slides and videos available online.

Note: Some of these introductory lectures may take a while to download.

Here are the [2015 Lecture topics](#).

Relevant web-texts are also available online:

“Quantum Theory for the Computer Age” [TitlePage](#) (*Click in first page to precede*), [Unit 1](#)

“[Principles of Symmetry Dynamics and Spectroscopy](#)”

So are the *WebApps* of various demos, animation, and visualization aids [WebApp Portal](#) (*Click in first page to precede*)

All classes will be recorded and posted on [our YouTube Channel](#)

We'll try to adjust 2017- Course as much as possible to *student's research interests*

Topics with past, current, and future involvement of group representation theory:

Spectra of particles, nuclei, atoms, molecules, and solids

Laser optics and optical polarization theory

Quantum information theory

Relativity theory