

Sommerfeld Theory Colloquium

Wednesday, June 22th, 2005

at 11:15 am

Room 349, Theresienstr. 37 – 3rd floor

Dr. Ron Lifshitz

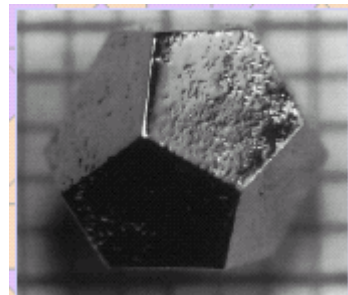
School of Physics & Astronomy, Tel Aviv University

Symmetry and Color Symmetry in Quasicrystals

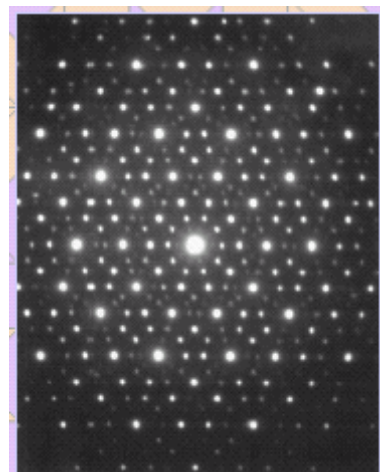
Dan Shechtman's discovery of quasicrystals, over 15 years ago, has changed the way we think about such elementary concepts as crystallinity, long-range order, and symmetry. Unfortunately, complicated mathematical descriptions in abstract high-dimensional spaces have stood in the way of disseminating our current understandings of these concepts to a broad community of scientists. (How many of us still teach our students that a crystal is a periodic repetition of a unit cell?)

I shall review the notion of color symmetry and explain—without the use of highdimensional tricks—exactly what we mean today when we say that a certain rotation is a symmetry of a crystal. This redefinition of crystalline symmetry applies to all crystals known to date and will be used to generalize the theory of color symmetry to quasicrystals. If time permits, I shall comment on the controversy regarding the observation of antiferromagnetic quasicrystals.

gezeichnet: Mukhanov, von Delft



Ho-Mg-Zn single crystal.
I.R. Fisher *et al.*, PRB **59**
(1999) 308-321.



Electron diffraction pattern of
an icosahedral quasicrystal