

MATH COLLOQUIUM

Hidden symmetries in everyday operators

Stephan Garcia
Pomona College

Date : Wednesday, March 10, 2010

Time : 14:00

Place : TB 250, Boğaziçi Üniversitesi

Abstract: What do a 2×2 matrix, a Jordan block, a complex Hankel matrix, the adjacency matrix of a graph, $\int_0^x f(y)dy$ and the Fourier transform have in common? They each enjoy hidden symmetries (can you find them?) which are part of a general theory, only recently developed by the speaker and his collaborators. This talk should be accessible to graduate students and advanced undergraduates. (Partially supported by NSF Grant DMS-0638789).

$$\begin{array}{ccc} \begin{pmatrix} 0 & 1 \\ 0 & 0 \end{pmatrix} & \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} & \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{pmatrix} & \begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 2 & 2 & 0 \end{pmatrix} \\ \begin{pmatrix} 1 & i & 2 \\ -i & 2 & 1+3i \\ 2 & 1-3i & 4 \end{pmatrix} & \begin{pmatrix} 1 & i & 0 \\ 0 & 0 & -i \\ 0 & 0 & 1 \end{pmatrix} & \begin{pmatrix} -2 & -1 & 2 \\ 5 & -3 & -2 \\ 2 & 4 & 1 \end{pmatrix} \\ \begin{pmatrix} 3 & 4 & 5 \\ 2 & 3 & 4 \\ 1 & 2 & 3 \end{pmatrix} & \begin{pmatrix} 1+4i & (-2-i)\sqrt{2} & -1-4i \\ i\sqrt{2} & 0 & i\sqrt{2} \\ -1 & (2-i)\sqrt{2} & 1 \end{pmatrix} & \end{array}$$

Tea and coffee will be served at 15:00