

## MECHANICAL ENGINEERING STUDENT SEMINAR

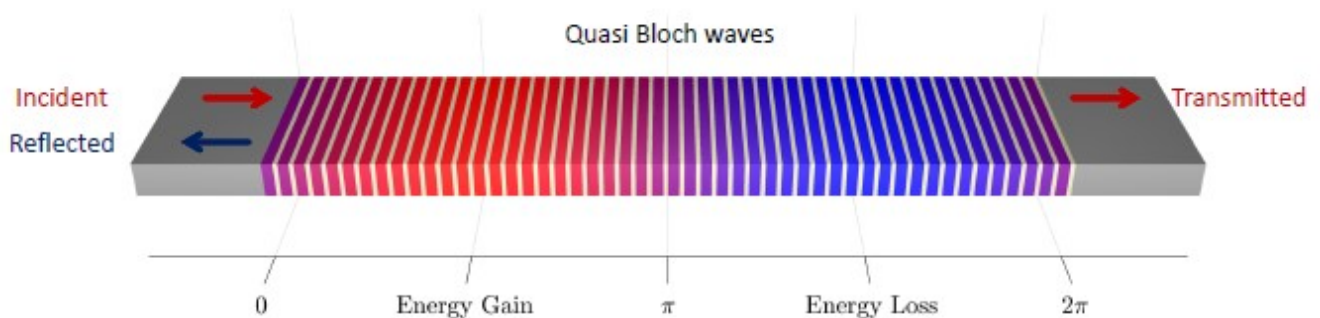
Wednesday, December 07 2022 at 13:30, D. Dan and Betty Kahn Building, Auditorium 1.

### Encircling exceptional points of Bloch waves: mode conversion and anomalous scattering

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The normal modes of nonconservative systems coalesce at the so-called exceptional points (EPs) of their spectrum. These degeneracy points are the source of unusual phenomena, some of which are accessed by encircling the points in a suitable space. Here, we encircle the EPs of the transfer matrix of a periodic laminate, using a spatial perturbation in its stiffness. We investigate how, collectively, mode conversion in the laminate and the fields it scatters depend on the parameters of the loop. We find that the starting point of the loop has a significant effect on various counterintuitive phenomena: it determines if the laminate acts as a source or a sink of energy; how mode conversion takes place; if the reflectance is greater than one; and if there is spatial asymmetry in the energy flow with respect to the direction of the incident waves. Our findings are relevant for the development of devices for elastic wave manipulation.



Note: the seminar will be given in Hebrew