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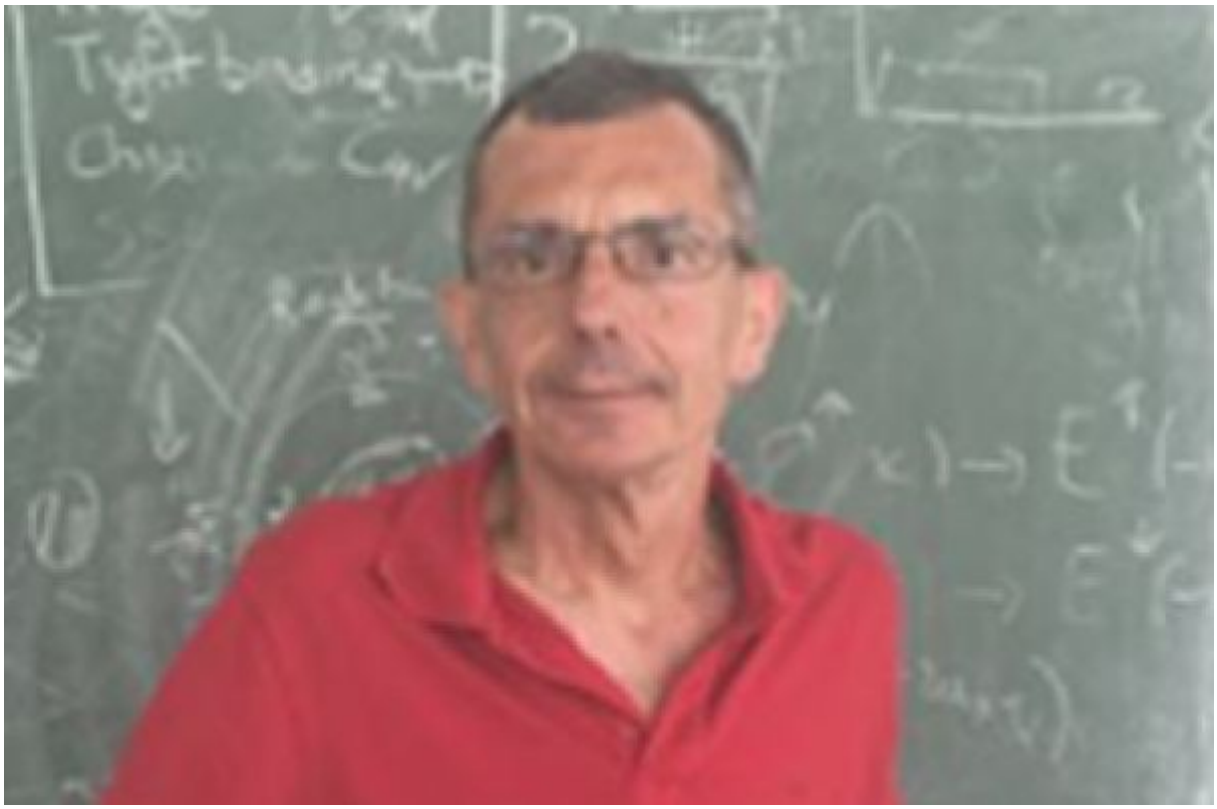

FRANCISCO GUINEA

June 30, 2022
12:00 to 13:30
ICFO Auditorium

"ELECTRON-ELECTRON INTERACTIONS AND SUPERCONDUCTIVITY IN TWISTED BYLAYER GRAPHENE AND RELATED MATERIALS"

By Francisco Guinea (Imdea Nanoscience, Madrid, Spain & Donostia International Physics Center, San Sebastian, Spain)

BIOGRAPHY:

Born in Madrid, Spain, January 29th, 1953. B. Sc. Universidad Complutense de Madrid, 197 . Ph. D. Universidad Autonoma de Madrid, 1980. Current employer, Imdea Nanocienci , Madrid, Spain, and Donostia International Physics Center, San Sebastian, Spain. Theoretic l condensed matter physicist, with contributions to many areas, including statistic l mechanics and materials scienc

ABSTRACT:

The effect of electron-electron interactions in twisted bilayer graphene is enhanced by the narrowness of the central bands, and by the complexity of the electronic wavefunctions. The long-range electrostatic interaction is the strongest coupling in twisted bilayer graphene. The way in which this interaction determines the phase diagram of twisted bilayer graphene will be discussed. Long wavelength charge fluctuations, modified by the Coulomb interaction, and also by longitudinal acoustic phonons, can lead to a net attraction, even at long distances, and contribute to the existence of superconductivity. Comparison between twisted bilayer graphene and other graphitic systems with narrow bands will also be presented.