Group Ring Groups

SPEAKER:
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TIME & VENUE:
2:00 - 3:00pm, April 16 | Room 211, NYU Shanghai Pudong Campus

ABSTRACT:
A group ring $RG$ of a finite group $G$ over a ring $R$ is the tool that serves as a meeting place for the interplay between group theory and ring theory. In case $R$ is the ring of integers $\mathbb{Z}$ then, in some sense, the integral group ring $\mathbb{Z}G$ is solely based on the defining group $G$ and hence, in this case, the interplay between $G$ and $\mathbb{Z}G$ should be the strongest. The defining group $G$ is a subgroup of the group of invertible elements $U(\mathbb{Z}G)$ of the group ring $\mathbb{Z}G$ and hence, if the interplay between group and ring theory plays its role well, then one should be able to rediscover the group $G$ from the unit group $U(\mathbb{Z}G)$.

It is this interaction between groups and group rings and their unit group that is theme of this lecture.

We will start with some historic notes on the introduction of group rings and representations of groups. Next we will outline some of the main challenges in the area and also we will explain some natural constructions of units in integral group rings. This will lead us to some natural methods in order to tackle some of the fundamental problems and outline some recent fundamental results.

BIOGRAPHY:
Eric Jespers is a professor of mathematics at the Vrije Universiteit Brussel, Belgium. After finishing his Ph.D. at the K.U. Leuven he held positions at the University of Stellenbosch, University of Cape Town, Memorial University of Newfoundland and Vrije Universiteit Brussel. His main research focuses on algebra, in particular, group theory, semigroup theory, and ring theory. He wrote four books, one on alternative rings and loop rings, one on semigroup rings and two volumes on unit groups of orders.