Department of Mathematical Sciences

Report on research collaboration

between

Dr. Rajat Kanti Nath, Department of Mathematical Sciences, Tezpur University

and

Dr. Reza Sharafdini, Department of Mathematics, Faculty of Science, Persian Gulf University, Bushehr 75169-13817, Iran

Title of collaboration:

Various spectra and energies of commuting graphs of finite rings

Summary of collaboration:

A collaborative research work was undertaken by Dr. Rajat Kanti Nath and Dr. Reza Sharafdini with the aim to study various spectra and energies of commuting graphs of finite rings. The main emphasis in this work was to compute spectrum, Laplacian spectrum, Signless Laplacian spectrum and their corresponding energies of commuting graphs of some classes of finite rings. Expertise and resources from both the collaborators were put together to come up with explicit expressions for various spectra and energies of non-commutative rings of order p^3, p^4, p^5, p^2q and p^3q, where p and q are primes. Eventually, we show that the commuting graphs of these rings are super integral but neither super hyperenergetic nor super borderenergetic. The collaboration was mostly restricted in online mode with exchange of ideas and results over electronic mode of communication.

Duration of collaboration:

The collaboration started in the month **January, 2019** and culminated in the form of a published research paper in the month of **December, 2020**.

Details of collaboration:

Details of collaboration could be found in the article:
Various spectra and energies of commuting graphs of finite rings, Hacettepe Journal of Mathematics and Statistics, vol. 49, no. 6, p. 1915--1925, 2020.

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