Department of Mathematical Sciences

Report on research collaboration

between

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

and

Dr. Deiborlang Nongsiang, Department of Mathematics, Union Christian College, Umiam-793122, Meghalaya, India

Title of collaboration:

Solvable graphs of finite groups

Summary of collaboration:

A collaborative research work was undertaken by Dr. Rajat Kanti Nath and Dr. Deiborlang Nongsiang with the aim to study solvable graphs of finite groups. The main emphasis in this work was to realize the graph and obtain results on genus, diameter and relation between solvability degree and solvable graph. Expertise and resources from both the collaborators were put together to come up with the realization that the solvable graph of any non-solvable finite group is not a star graph, a tree, an n-partite graph for any positive integer $n \geq 2$ and not a regular graph having girth 3. We proved that the solvable graph of any non-solvable finite group is neither planar, toroidal, double-toroidal nor triple-toroidal. Finally, we obtained a relation between the number of edges of the solvable graph and the solvability degree of a group. 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 **March, 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:
Solvable graphs of finite groups, Hacettepe Journal of Mathematics and Statistics, vol. 49, no. 6, p. 1955--1964, 2020.

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