Possible projects

If you would like to write/talk about something else, I am open for suggestions. This list may expand a bit, this is a first approximation.

1. Tessalations of $\mathbb{S}^2$ and Platonic solids.

2. Hyperbolic plane – description and geometric properties.

3. Different models of $\mathbb{H}^2$.

4. Group actions on graphs.

5. Amalgamated products, HNN extensions, graphs of groups (some topology will be needed).

6. Cayley graphs.

7. Regular polytopes.

8. Subgroups of free groups are free: Schreir method.

9. Subgroups of free groups are free: Nielsen method.

10. Presentation of subgroups.

11. Classification of finitely generated abelian groups.

12. Prove that no two plane crystalographic groups are isomorphic (by comparing index of derived subgroups or finite orders of elements).

13. Hyperbolic groups.

14. Classification of hyperbolic isometries.

15. $\mathbb{R}$-trees.