Big mathematics?

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It took 112 years to formally state and prove the theorem that is now known as Classification of Finite Simple Groups. Is this an example, maybe the first example, where mathematical work falls in the "big science" category?

From J_1 to Ru: The Genesis of 15 Sporadic Simple Groups

Atle Bjarne Höhne
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At the end of 1964, Zvonimir Janko announced the construction of a new finite simple group, which is now known as J_1. Over the following eight years, several other sporadic simple groups have been conjectured to exist by different mathematicians. This includes the group Ru named after Arunas Rudvalis, which was constructed by John Conway and David Wales in 1972. A broad spectrum of research led to the discovery of these 15 groups, involving the Brauer-Fowler Theorem, Donald Higman's conditions on the parameters of a rank 3 permutation group, John Leech's dense lattice packing in dimension 24, Bernd Fischer's notion of a $\{3\}$-transposition group and much more. We will give an overview of the genesis of these sporadic groups and look at some original unpublished material. This work was motivated by a project on the history of the Classification Theorem for Finite Simple Groups, led by Volker Remmert and Rebecca Waldecker.

Laws and mixed identities for finite groups

Andreas Thom
Technische Universität Dresden

I will speak about recent results about the shortest length of laws and mixed identities for finite groups, explaining some joint with with Jakob Schneider and Henry Bradford.

On the Search for Subgroups in Algebraic Groups: Maximal Rank in A_n

Laura Voggesberger
Ruhr-Universität Bochum

Let k be any field and let G be a connected reductive algebraic k-group. Associated to G is an invariant called the *index* of G (a Dynkin diagram along with some additional combinatorial information). Tits showed that the k-isogeny class of G is uniquely determined by its index and the k-isogeny class of its anisotropic kernel.
Let H be a connected reductive k-subgroup of maximal rank in G. One can define an invariant of the $G(k)$-conjugacy class of H in G called the *embedding of indices* of $H \subset G$. Using this, one can begin to classify the maximal connected subgroups of maximal rank in G up to an invariant called "index-conjugacy" for any arbitrary field k and G absolutely simple. This has been done for absolutely simple groups of exceptional type by D. Sercombe. We will continue this work for absolutely simple groups of classical type. This talk will focus on the results for A_n and explain the algorithm at the example of A_n.
This is a joint work with Vanthana Ganeshalingam and Damian Sercombe.