



Prix Schläfli Mathematics 2024

Laudatio for the Award Ceremony of the **Prix Schläfli Mathematics 2024** of the Swiss Academy of Sciences (SCNAT) for **Dr Jonathan Gruber**

The Jury of the Prix Schläfli Mathematics 2024 of the Swiss Academy of Sciences (SCNAT), consisting of Professors Bruno Colbois (UniNE), Mikaela Iacobelli (ETHZ), Thomas Studer (UniBE), Corinna Ulcigrai (UniZH) and Alain Valette (UniNE) has evaluated truly excellent applications and decided unanimously to award the Prix Schläfli Mathematics 2024 to Dr Jonathan Gruber for his exceptional thesis in algebraic representation theory.

Jonathan Gruber's thesis is a remarkable contribution to the representation theory of reductive groups in positive characteristic, in contrast with what happens in characteristic 0, where the representation theory is semisimple (i.e., every quotient module is actually a sub-module) and the dimensions of all simple modules are known, it is known that every non-abelian reductive group in positive characteristic has non-semisimple modules, and the dimension of simple modules is unknown. Gruber's thesis offers several major advances along those lines, especially concerning the classical Clebsch-Gordan problem, i.e., the decomposition of a tensor product of simple modules into simple modules. A breakthrough in Gruber's thesis was the identification of a particular direct summand, called a 'generic component,' in the tensor product of two simple modules. Dr Gruber is certainly on a positive gradient: the committee was struck by the fact that Dr Gruber has seven single-authored papers or preprints, five published or accepted in excellent journals (Transactions AMS, Representation Theory, ...), among which three are originating from his thesis work. Quoting Prof. Michael Bate (York), an expert consulted by the committee: 'It is my judgment that the work contained in this submission is of the highest quality and it is almost certain to make a major and lasting impact on the field. It is very rare for a recent doctoral student to make this kind of impact.'

Jonathan Gruber obtained his BSc and MSc in Mathematics at the University of Kaiserslautern (Germany) in 2017 and 2018, respectively; his average grade was 1.0 (best grade), for which he got the 'Award for outstanding achievements as a master student.' He did his Ph.D. thesis, 'Generic direct summands of tensor products for simple algebraic groups and quantum groups at roots of unity,' at EPFL from 2018 to 2022, under the supervision of Prof. Donna Testerman. He worked as a teaching assistant at EPFL and co-organized the 4th Young Algebraists' Conference at EPFL in September 2021. After a one-year research fellowship at the National University of Singapore in the working group of Huanchen Bao, Gruber was awarded an SNSF postdoc mobility fellowship for a research stay at the University of York, working with Chris Bowman and Stephen Donkin. Since September 2024, he started a postdoc at Erlangen with Peter Fiebig.

Prof. Alain Valette, president of the Prix Schläfli Mathematics 2024 jury
Award Ceremony at EPFL in Lausanne, November 2024