

**Atlantic Association for Research in the Mathematical Sciences
Atlantic Algebra Centre (AAC)
Network of Ontario Lie Theorists (NOLT)**

AARMS Distinguished Lecturer
Professor Alexander Merkurjev
June 13 –17, 2016
Memorial University of Newfoundland
St John's, Newfoundland and Labrador

Report

Alexander Merkurjev (University of California – Los Angeles) is an illustrious mathematician working in the area of Algebra. The list of his achievements is long and includes the following. In 1986, Alexander Merkurjev was a plenary speaker at the International Congress of Mathematicians in Berkeley, California. His talk was entitled "Milnor K-theory and Galois cohomology". In 1994, he gave an invited plenary talk at the 2nd European Congress of Mathematics in Budapest, Hungary. In 1995, he won the Humboldt Prize, a prestigious international prize awarded to renowned scholars. In 2012, he won the Cole Prize in Algebra, for his fundamental contributions to the theory of essential dimension.

In 2016, Alexander Merkurjev was named an AARMS Distinguished Lecturer. His visit to Atlantic Canada was in the period June 12 – 18, 2016. During this visit, he delivered two lectures on St. John's campus of Memorial University of Newfoundland (MUN).

The first one, on June 14, was a plenary lecture for the participants of the International Workshop "Hopf Algebras, Algebraic Groups and Related Structures" organized by Atlantic Algebra Centre (AAC) and the Network of Ontario Lie Theorists (NOLT). The title was "Rationality problem for classifying spaces of algebraic groups". The lecture was also attended by some students and faculty of the Department of Mathematics and Statistics of MUN, to the total of 40 people.

The second one, on June 15, was a public lecture for anyone interested in modern mathematics. This lecture was widely advertised, including the Events section on the web site of MUN (www.mun.ca/math/events/PublicLectureMerkurjev.pdf) and the university newspaper Gazette (<https://gazette.mun.ca/.../from-simple-algebras-to-the-bloch-kato-conjecture>). Below we give a short description of the public lecture.

In the recent years, the theory of algebraic groups has witnessed an "intrusion" of cohomological methods of algebraic geometry and algebraic topology. These new methods have led to breakthroughs on a number of classical problems in algebra, which were beyond the reach of earlier, purely algebraic techniques. Voevodsky's use of techniques from homotopy and cobordism in the context of algebraic categories have resulted in the solution of, first, the Milnor conjecture and, later, the Bloch-Kato conjecture, which is a vast generalizations of the celebrated Merkurjev-Suslin norm residue isomorphism theorem.

In his public lecture, Professor Merkurjev gave a historical overview of these methods, starting from the celebrated result from the 1980's about the structure of central simple algebras of period 2, which relates the 2-torsion of the Brauer group with Milnor K-theory, and culminating in the Milnor and Bloch-Kato conjectures. One of the key techniques deals with the notion of a norm variety. Professor Merkurjev explained the role of these geometric objects (Severi-Brauer varieties and norm quadrics) and their relation to the proofs of the mentioned conjectures. There were about 50 people in the audience, including students and postdoctoral fellows (primarily associated with AAC and NOLT, but also from other universities) as well as a number of specialists from Canada and abroad (Argentina, Brazil, Mexico, Russia, Spain, Germany, UK and USA).

Professor Merkurjev's visit was organized by Yuri Bahturin, Mikhail Kochetov and Yorck Sommerhäuser (AAC) and Kirill Zaynullin (NOLT). Financial support was provided by Atlantic Association for Research in the Mathematical Sciences and the Department of Mathematics and Statistics of MUN.

Breakdown of expenses and revenues

1. Expenses

a. Hotel accommodation:	\$ 1,948.84
b. Reception after the public lecture:	\$ 500.00
c. Local transportation:	\$ 51.16

Total of expenses:	\$ 2,500.00
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2. Revenues

a. AARMS:	\$2,000.00
b. Department of Math & Stats (MUN):	\$ 500.00

Total of revenues:	\$2,500.00
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3. Revenues minus Expenses – Nil

Yuri Bahturin
Director
Atlantic Algebra Centre