

Fields Institute for Research in Mathematical Sciences
Atlantic Association for Research in the Mathematical Sciences
Atlantic Algebra Centre (AAC) & Network of Ontario Lie Theorists (NOLT)
International Workshop «Algebraic Groups and Lie Algebras»
August 17 – 21, 2015
Bonne Bay Marine Station of Memorial University of Newfoundland
Norris Point, Newfoundland and Labrador

Report

On August 17–21, Atlantic Algebra Centre (AAC) and the Network of Ontario Lie Theorists (NOLT) organised the International Workshop «Algebraic Groups and Lie Algebras». This was the second international workshop jointly organised by AAC and NOLT. The first one, «Enveloping Algebras and Representation Theory», was held in August – September 2014 on St. John's campus of Memorial University. Also, the members of both AAC and NOLT took an active part in the workshop «From Lie Algebras to Group Schemes» organized by the University of Ottawa and Carleton University in May 2015.

Algebraic groups are one of the cornerstones of modern mathematics. They are closely related to Lie groups and combine methods of Algebra, Algebraic Geometry, Topology, Functional Analysis, Lie Theory and other areas. Because of the richness of the subject, Algebraic groups find extensive applications in mathematics and natural sciences, including applications in Cryptography, Harmonic Analysis, Algebraic Topology, conservation laws in Physics, symmetries of molecules in Chemistry, etc. One of the main tools in the theory of algebraic groups is the theory of Lie algebras. And, conversely, algebraic groups often serve as an important tool in the study of Lie algebras. This is why researchers usually study both subjects at the same time, which turns out to be very effective. There are hundreds of mathematicians in the world

working in these areas. The theory has become very deep and has many specialized branches and many applications. In our workshop, we focussed on the following areas: actions of algebraic groups by automorphisms of algebraic varieties, graded algebras and superalgebras, linear representations of groups and Lie algebras, and applications of algebraic groups to the structure theory of algebras including positive characteristic. Most of these areas are actively studied by the members of AAC and NOLT.

The workshop was held at the Bonne Bay Marine Station (BBMS) of Memorial University of Newfoundland, in the community of Norris Point on the West Coast of Newfoundland. The Organizing Committee consisted of Yuri Bahturin (AAC), Mikhail Kochetov (AAC) and Kirill Zynullin (NOLT). The workshop was funded by AARMS, Fields Institute and Memorial University. There were 24 participants from seven countries: Brazil, Canada, Russia, Slovenia, Spain, Sweden, and UK.

The list of invited speakers and the topics of their lectures were as follows:

1. Ivan Arzhantsev (Moscow State University, Russia) «Algebraically generated automorphism groups»
2. Cristina Draper (University of Malaga, Spain) «Maximal abelian diagonalizable groups & fine gradings on simple Lie algebras»
3. Stefan Gille (University of Alberta) «The Rost nilpotence principle»
4. Nikita Karpenko (University of Alberta) «Upper-homogeneous varieties»
5. Erhard Neher (University of Ottawa) «Octonions»
6. Victor Petrogradsky (University of Brasilia, Brazil) «Growth and asymptotics in algebras and groups»
7. Alexander Premet (University of Manchester, UK) «Rigid orbits and Lusztig–Spaltenstein induction in good characteristic»

In addition, one-hour research talks were given by Seidon Alsaody (University of Uppsala, Sweden), Janez Bernik (University of Ljubljana, Slovenia), Mitja Mastnak

(Saint Mary's University), and Yorck Sommerhäuser (Memorial University). Several short communications were given by graduate students and postdoctoral fellows.

August 19 was devoted to informal discussions and excursions in Gros Morne National Park, which surrounds the Bonne Bay Marine Station.

Breakdown of expenses and revenues

1. Expenses

1. Airfare for invited speakers	\$ 6,903.64
2. Local transportation expenses	\$ 1,063.25
3. Accommodation for speakers and students in Norris Point	\$ 4,780.74
4. Meals for speakers and students in Norris Point	\$ 2,670.19
5. Rental of facilities and staff salary at BBMS	\$ 937.76
6. Printing services and stationery	\$ 157.49

Total of expenses: \$16,513.07

2. Revenues

1. Registration fees	\$ 780
2. Fields Institute	\$ 5,000
3. AARMS	\$ 5,000
4. Memorial University, Dean of Science	\$ 1,000
5. AAC Budget	\$ 4,733.07

Total of revenues: \$16,513.07

3. Revenues minus Expenses – Nil

Yuri Bahturin
Mikhail Kochetov
Kirill Zaynullin