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EDITORIAL NOTE: GEOMETRY IN ALGEBRA AND ALGEBRA IN GEOMETRY

Workshop on geometry in algebra and algebra in geometry

Opening note

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Abstract
This short note describes some of the contributions to the Workshop GAAG 2019 held in Medellin, Colombia.

Keywords Algebra · Geometry

1 About the workshop

Part of this issue of the Sao Paulo Journal of Mathematical Sciences is devoted to publishing some of the most relevant contributions to the "V Workshop on Geometry in Algebra and Algebra in Geometry—GAAG", held in 2019 at Universidad de Antioquia, Medellin—Colombia.

The first edition of the workshop was in 2015 and took place at the Institute of Mathematics and Statistics of the University of Sao Paulo. The main goal of the workshop is gathering researchers whose interests are in Algebra, Geometry and

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their interactions. All of the previous editions of the Workshop GAAG took place in Sao Paulo, more precisely UNICAMP (2016) and IME-USP (2017, 2018), hence the fifth edition represents a step towards the internationalization of this event.

The interaction between algebra, geometry and topology has been extremely fruitful leading for instance to the development of important areas of mathematics, such as algebraic topology and algebraic geometry. More recently, new techniques have been developed and applied with great success in the solution of interesting problems with roots in algebra and geometry. For instance, the categorification of manifolds through the notion of Lie groupoid sheds light on the study of singular spaces such as orbifolds and stacks; the theory of differential graded Lie algebras and its connection with deformations of geometric structures; deformation quantization of Poisson manifolds and Poisson algebras; symplectic structures on moduli spaces of quiver representations built using geometric invariant theory; geometric realization of Kac–Moody Lie algebras via Nakajima varieties; the study and development of higher categorical structures in order to understand hidden symmetries of classical and enriched geometric structures. The Workshop GAAG aims at further exploring this kind of interactions between algebra and geometry, strengthening the already existing and discovering new ones.

The present issue contains contributions by some of the speakers invited to the fifth Workshop GAAG. The topics touched by the workshop and published in this special volume include: symmetries of affine manifolds, symmetries of differential equations, representation theory in a wide sense (posets, string algebras, Nakayama algebras, groupoids, quivers), deformation theory, higher structures and mathematical physics, algebraic geometry, algebraic topology and Jacobi and Poisson geometry.

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