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I am mainly interested in mutation-finite cluster algebras. All the projects (and results) below are joint with A. Felikson and M. Shapiro.

One of the aims is to construct a geometric object realizing mutations of skew-symmetrizable mutation-finite matrices. It occurs that this can be done by considering triangulations of marked orbifolds. As in the case of cluster algebras from surfaces introduced by Fomin, Shapiro and Thurston (extending earlier works of Fock and Goncharov), complex of triangulations of orbifolds (considered earlier by Chekhov) coincides with exchange graph of some mutation-finite cluster algebra. Further refinements of the construction allow to produce all but several finite mutation classes of skew-symmetrizable matrices. All the exclusions originate from extended affine root systems.

Moreover, slight modifications of the arguments of Fomin and Thurston allow to prove that cluster variables for cluster algebras from orbifolds can be realized by lambda lengths. In particular, this implies that exchange graph does not depend on coefficients.

One of the applications is a construction of an unfolding (introduced by Zelevinsky) for almost all mutation-finite skew-symmetrizable matrices. In case of orbifolds unfolding can be understood as a combination of ramified covering and a "cut-and-paste" procedure. At the same time, for one series of mutation-finite matrices no unfolding is known.

The unfolding, in its turn, immediately leads to a proof of the positivity conjecture for corresponding cluster algebras (by using the result of Musiker, Schiffler and Williams for algebras from surfaces). Another application of unfolding (together with geometric interpretation of mutations) is a quasi-isometry of corresponding exchange graphs. In particular, this allows to find a growth rate of all cluster algebras from orbifolds. Growth rate of the exclusions can be computed separately (this is a joint work with H. Thomas).