

MATHEMATICAL MEETING OF SERBIA AND  
MONTENEGRO 2019

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# Welcome Address

The idea of organizing “Mathematical meeting of Serbia and Montenegro” came from group of mathematicians of younger generation from Podgorica and Belgrade. After the breakup of the state union of Serbia and Montenegro, the mathematical collaboration between the two successor states has diminished to a point of near-vanishing, reduced only to few individual contacts. Moreover, Serbia and Montenegro are rapidly drifting apart in almost all respects, especially in the domain of culture and science. Needless to say, cultural and scientific isolation is often harmful, and indeed, the present rift between Serbia and Montenegro presents a great hindrance for both countries.

The response to the “Mathematical meeting of Serbia and Montenegro” was surprisingly good - over 60 mathematicians participated, not only from Serbia and Montenegro, but also from other countries in Europe and the world. The success reflected the pressing need of mathematical communities in the region to strengthen and deepen their collaboration and promises to be a good foundation for establishing “Mathematical meeting of Serbia and Montenegro” as one of the central annual event of the region’s mathematical calendar.

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# SOLVING SOME NEW CLASSES OF DIFFERENCE EQUATIONS AND THEIR SYSTEMS IN A CLOSED FORM

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In this talk we will describe the achievement of solutions of some new significant difference equations and their systems of higher order in a closed form. There are some equations the solutions of which in closed form have not appeared in the literature hitherto.

**Keywords:** difference equations, solvable difference equations, systems of difference equations

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## FACET COLOURING OF NESTOHEDRA

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A proper colouring of a polytope is a surjective function from the set of facets to a set of  $m$  colours such that every two facets associated with the same colour are separated, i.e. have no vertex in common. The chromatic number of a polytope is the minimal  $m$  such that there exists a proper colouring of its facets in  $m$  colours. This talk presents the chromatic numbers of associahedra and some others interesting members of the family of nestohedra.

**Keywords:** chromatic number, facet colouring, associahedron, cyclohedron

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## MINIMISERS AND KELLOGG'S THEOREM

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We extend the celebrated theorem of Kellogg for conformal mappings to the minimizers of Dirichlet energy. Namely we prove that a diffeomorphic minimiser of Dirichlet energy of Sobolev mappings between double connected domains having  $C^{1,\alpha}$  boundary is  $C^{1,\alpha}$  up to the boundary. It is crucial that, every diffeomorphic minimizer of Dirichlet energy has a very special Hopf differential and this fact is used to prove that every diffeomorphic minimizer of Dirichlet energy can be locally lifted to a certain minimal surface near an arbitrary point inside and at the boundary.

**Keywords:** minimizers, Kellogg's theorem, Dirichlet energy

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