

ALTERMAN SUMMER SCHOOL ON GEOMETRIC ALGEBRA AND KÄHLER CALCULUS 2017

Faculty of Transportation Engineering

20 Hr. Smirnenski Blvd., Sofia (Bulgaria)

Timing	Monday 31 st July	Tuesday 1 st August	Wednesday 2 nd August	Thursday 3 rd August	Friday 4 th August
9:00 – 10:00	Welcome Ceremony	Keynote lecture: <i>Riemann surfaces: Meeting point of Algebra, Analysis, Geometry</i> (Prof. Norbert A'Campo)	Excursion	Keynote lecture: <i>Riemann surfaces: Meeting point of Algebra, Analysis, Geometry</i> (Prof. Norbert A'Campo)	Clifford algebra with the CLIFFORD package for Maple in the computer lab (Prof. Rafał Abłamowicz)
10:00-11:00	Keynote lecture: <i>Riemann surfaces: Meeting point of Algebra, Analysis, Geometry</i> (Prof. Norbert A'Campo)	Definitions of Kähler algebra and perspective on the Kähler calculus		Keynote lecture: <i>The Unity of Geometry</i> (Prof. José Vargas)	Clifford algebra with the CLIFFORD package for Maple in the computer lab (Prof. Rafał Abłamowicz)
11:00-11:30	Coffee break	Coffee break		Coffee break	Coffee break
11:30-12:30	The Clifford algebras of the Euclidean and hyperbolic planes	Basic Kähler calculus in Cartesian coordinates		Exterior and interior differentiations . Leibniz rules	Keynote lecture: <i>Riemann surfaces: Meeting point of Algebra, Analysis, Geometry</i> (Prof. Norbert A'Campo)
12:30-13:30	Definition, fundamentals and perspective on Clifford algebra	Idempotents, ideals, spinors, primitive idempotents, exterior systems, tensor product of Kähler and tangent Clifford algebras		Laplacians, harmonic strict harmonic and constant differentials	Green's identities and conservation laws. Lie differentiation and angular momentum
13:30-15:00	Lunch	Lunch		Lunch	Lunch
15:00-16:00	The Clifford algebra of space and spacetime. Reflections, rotations and Lorentz transformations	Particles and antiparticles, chirality, leptons, Cooper pairs, photons		Hodge dual and relation of interior differentiation to the co-derivative	The Kähler-Dirac equation with electromagnetic coupling. Emergence of standard charge
16:00-17:00	Exterior algebra and exterior calculus	The complex variable formalism as a minor extension of the Kähler calculus over the reals		The Kähler equation and its adjoint	Electrons-positrons and the hydrogen atom

(2nd version, posted June 1st 2017)