

The second CARBTRIB Meeting on
"Nano-phenomena and Functionality of modern Carbon-Based Tribo-Coatings"
Under support of the Leverhulme Trust
Sevilla, 19-21 April 2017
Preliminary Scientific Program

Wednesday 19 April 2017 (salón de grados, CITIUS-Celestino Mutis building)

Theme: CARBTRIB partners: reports and discussions

09:25 – 09:40 **Opening addresses** F.M. Borodich (Cardiff University, UK), P. Aparicio Fernández (Universidad de Sevilla, Spain)

09:40 – 10:20 **Juan Carlos Sánchez López** (Instituto de Ciencia de Materiales de Sevilla (CSIC-US), Seville, Spain) "Surface texturing for improved tribological performance: the snake skin case"

10:20 – 10:50 **Irina G. Goryacheva¹, Elena V. Torskaya¹, Nabeel Almuramady² and Feodor M. Borodich²** (¹Ishlinsky Institute for Problems in Mechanics of Russian Academy of Sciences, Moscow, Russia, ²School of Engineering, Cardiff University, UK) "Modeling of surface fracture of coated rough surface of microgear teeth"

10:50 – 11:10 **Irina G. Goryacheva¹ and Elena V. Torskaya¹ and Juan Carlos Sánchez López²** (¹Ishlinsky Institute for Problems in Mechanics of Russian Academy of Sciences, Moscow, Russia, ²Instituto de Ciencia de Materiales de Sevilla (CSIC-US), Seville, Spain) "Comparison of contact and internal stresses within TiC/a-C(:H) coatings prepared by DC and HIPIMS in friction interaction"

11:10 – 11:40 Coffee break

11:40 – 12:20 **Andras Vernes** (¹Austrian Center of Competence for Tribology AC2T research GmbH) and **Friedrich Franek^{1,2}** (¹Austrian Center of Competence for Tribology AC2T research GmbH and ²Vienna University of Technology) "Ab-initio tribology of carbon-based systems"

12:20 – 13:00 **Nicole Dörr** (Austrian Center of Competence for Tribology AC2T research GmbH and Vienna University of Technology) "Interaction of lubricants with DLC"

13:00 – 14:00 Lunch

14:00 – 14:50 **Stanislav Gorb** (Zoological Institute: Functional Morphology and Biomechanics, Kiel University, Germany) "Bioadhesion: recent activities from Kiel, Germany".

14:50 – 15:20 **Elena Gorb** (Zoological Institute: Functional Morphology and Biomechanics, Kiel University, Germany) "Insect attachment on crystalline bioinspired wax surfaces."

15:20 Round Table Discussion

20:30 Dinner

Thursday 20 April 2017 (salón de grados, CITIUS-Celestino Mutis building)

Theme: Experimental and Theoretical Studies of Thin Films and Tribology

10:00 – 10:40 **Steve J. Bull** (School of Chemical Engineering and Advanced Materials, University of Newcastle, UK) "The tribology of DLC on plastic substrates"

10:40 – 11:20 **Andrei Y. Grigoriev and Nikolai K. Myshkin** (V.A. Belyi Metal Polymer Research Institute of National Academy of Sciences of Belarus, Gomel, Belarus) "Rough surfaces: from the parametric approach to the texture concept"

11:20 – 11:50 Coffee break

11:50 – 12:20 **Feodor M. Borodich¹, Elena L. Kossovich², and Svetlana A. Epshtein², Steve J. Bull³** (¹School of Engineering, Cardiff University, UK, ²National University of Science and Technology "MISiS", Moscow, Russia, ³School of Chemical Engineering and Advanced Materials, University of Newcastle, UK) "Evaluation of elastic moduli of components of inhomogeneous films by nanoindentation"

12:20 – 12:50 **Danila Prikazchikov¹, Leyla Sultanova¹, Feodor M. Borodich², Nikolay Perepelkin²** (¹School of Computing and Mathematics, Keele University, UK, ²School of Engineering, Cardiff University, UK) "Asymptotic analysis of contact problems for thin films and adhesion between surfaces"

12:50 – 13:50 Lunch

13:50 – 14:30 **Alexander N. Galybin** (The Schmidt Institute of Physics of the Earth of the Russian Academy of Sciences, Moscow, Russia) "Mechanics of crack systems in plane brittle solids"

14:30 – 15:00 **Nikolay Perepelkin¹, Feodor M. Borodich¹, Ivan Argatov²**
¹School of Engineering, Cardiff University, UK, ²Technical University of Berlin) "TBA"

Friday 21 April 2017 (salón de grados, CITIUS-Celestino Mutis building)

Theme: Ideas from Mathematics, Solids Mechanics and Statistics

09:30 – 10:10 **Askold G. Khovanskii** (Department of Mathematics, University of Toronto, Canada) "Newton polyhedra and applications"

10:10 – 10:50 **Julius Kaplunov** (School of Computing and Mathematics, Keele University, UK) "Comparison of asymptotic procedures for thin and periodic structures."

10:50 – 11:20 Coffee break

11:20 – 11:50 **John R. Willis** (DAMTP, University of Cambridge, UK) "The effective properties of a composite coating and a composite sandwich layer"

11:50 – 12:30 **Volodymyr Kushch** (V. Bakul Institute for Superhard Materials, Kiev, Ukraine) "Micromechanical model of heat transfer through the anisotropic nano composite coating"

12:50 – 13:50 Lunch

13:50 – 14:30 **Anatoly Zhigljavsky** (School of Mathematics, Cardiff University, UK) "Singular Spectrum Analysis, surface roughness and fault predictions"

14:30 – 15:10 **Andrey Pepelyshev¹ and Feodor M. Borodich²**
(School of Mathematics, ²School of Engineering, Cardiff University, UK) "Engineering surfaces and representative patterns of roughness at nano and microscales"

15:10 – 15:30 **Andrey Pepelyshev¹, Feodor M. Borodich², Emmanuel Brousseau², Alastair Clarke², Juan Carlos Sánchez López³**
(¹School of Mathematics, ²School of Engineering, Cardiff University, UK, ³Instituto de Ciencia de Materiales de Sevilla, Seville, Spain) "Statistical characteristics of roughness of deposited carbon coatings"

15:30 Closing of the Workshop