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## Sergey Dubkov, PhD

Senior Lecturer, Researcher

### Biosketch

Dubkov Sergey was born in 1988 in Kaluga region. In 2012, he graduated with honors from MIET in the field of "electronics and nanoelectronics". In 2015 he defended his thesis for the degree of candidate of technical sciences. From 2008 to the present, she has been working at MIET. From 2016 to the present, senior lecturer at the Institute for Advanced Materials and Technologies (course of lectures for bachelors "Physical fundamentals of nanoelectronics and nanosystems"). He is the Winner of the Youth Innovation Contest Program ("UMNIK") (2011), Winner of the scholarship of the President of the Russian Federation for young scientists and graduate students (2013-2015), Winner of the 2019 competition for state support of young Russian Candidate Scientists "Grant of the President of the Russian Federation" 2019-2020. Author of more than 40 scientific papers, including 8 patents for invention.

### Lecture courses

Physical bases of nanoelectronics and nanosystems

### Scientific activity

Author of more than 40 scientific papers, including 8 patents for invention. Responsible performer and head of research, the results of which are implemented in enterprises and in the educational process.

### Research Interests:

Promising technological processes of micro- and nanoelectronics, new materials for nanoelectronic devices, in particular: chemical vapor deposition, thin film deposition, carbon nanomaterials,

nanostructured materials, synthesis of nanoparticles and nanowires, nanomaterials for power engineering, emission structures, additive technologies.

#### Patents:

1. Gavrilov S.A., Gromov D.G., Dubkov S.V., Mironov A.E., Shulyaev A.S. A method of manufacturing interconnects semiconductor device. No. 2421847. 06/20/2011
2. Gavrilov S.A., Gromov D.G., Dubkov S.V., Mironov A.E., Shulyaev A.S. A method of manufacturing ordered nanostructures. No. 2462785. 09/27/2012
3. Gromov D.G., Dubkov S.V., Shulyatev A.S., Lebedev E.A., Mironov A.E. A method of manufacturing a high-capacity planar capacitor. No. 2533010. 09/18/2014.
4. Rogachev MS, Gromov D. G., Shtern Y.I., Dubkov S.V., Shtern M.Yu. The method of obtaining a thermoelectric element. No. RU 2601243. 2016.
5. Shulyaev A.S., Lebedev E.A., Gromov D.G., Dubkov S.V., Rygalin B.N. A method of manufacturing interconnects semiconductor devices. No. 2593415. Date of issue: 07/12/2016.

#### Articles

1. Dubkov S, Gromov D, Savitskiy A, Trifonov A, Gavrilov S. Alloying effects at bicomponent au-cu and in-sn particle arrays formation by vacuum-thermal evaporation. *Mater Res Bull.* 2019;112:438-44.
2. Karpinsky DV, Troyanchuk IO, Trukhanov AV, Willinger M, Khomchenko VA, Kholkin AL, Sikolenko V, Maniecki T, Maniukiewicz W, Dubkov SV, Silibin MV. Structure and piezoelectric properties of sm-doped BiFeO<sub>3</sub> ceramics near the morphotropic phase boundary. *Mater Res Bull.* 2019;112:420-5.
3. Khomchenko VA, Ivanov MS, Karpinsky DV, Dubkov SV, Silibin MV, Paixão JA. Weak ferromagnetic state in the polar phase of Bi<sub>1-x</sub>CaxFe<sub>1-x/2</sub>Nbx/2O<sub>3</sub> multiferroics. *Mater Lett .* 2019;235:46-8.
4. Wojtaś M, Karpinsky DV, Silibin MV, Gavrilov SA, Sysa AV, Nekludov KN, Dubkov SV. Pyroelectricity in graphene oxide doped P(VDF-TrFE) films. *Polym Test [Internet].* 2018;71:296-300.
5. Mierczynski P, Mierczynska A, Ciesielski R, Maniukiewicz W, Rogowski J, Maniecki TP, Dubkov S, Sysa A, Gromov D, Szyrkowska MI, Vasilev K. Modern ni and Pd–Ni catalysts supported on Sn–Al binary oxide for oxy-steam reforming of methanol. *Energy Technol.* 2018;6(9):1687-99
6. Mierczynski P, Dawid B, Maniukiewicz W, Mosinska M, Zakrzewski M, Ciesielski R, Kedziora A, Dubkov S, Gromov D, Rogowski J, Witonska I, Szyrkowska MI, Maniecki T. Fischer–Tropsch synthesis over various Fe/Al<sub>2</sub>O<sub>3</sub>–Cr<sub>2</sub>O<sub>3</sub> catalysts. *React Kinet Mech Catal.* 2018;124(2):545-61.
7. Mierczynski P, Ciesielski R, Zakrzewski M, Dawid B, Mosinska M, Kedziora A, Maniukiewicz W, Dubkov S, Gromov D, Szyrkowska M, Witonska I, Shtyka O, Maniecki T. Supported Ru–Ni catalysts for biogas and biohydrogen conversion into syngas. *Kinet Catal.* 2018;59(4):509-13.
8. Volkov RL, Borgardt NI, Gromov DG, Dubkov SV. Electron diffraction analysis of the structure of carbon nanopillars along the growth direction. *J Surf Invest.* 2018;12(3):473-9
9. Mierczynski P, Ciesielski R, Zakrzewski M, Dawid B, Mosinska M, Maniukiewicz W, Dubkov S, Gromov D, Szyrkowska MI, Witonska I, Shtyka O, Maniecki T. Carbon deposits formed on the surface of Ru–Ni catalysts during the mixed reforming of methane process. *Kinet Catal.* 2018;59(3):372-7.
10. Mierczynski P, Dubkov SV, Bulyarskii SV, Pavlov AA, Skorik SN, Trifonov AY, Mierczynska A, Kitsyuk EP, Gavrilov SA, Maniecki TP, Gromov DG. Growth of carbon nanotube arrays on various

- CtxMey alloy films by chemical vapour deposition method. *J Mater Sci Technol.* 2018;34(3):472-80.
11. Dubkov S, Trifonov A, Shaman Y, Kitsyuk E, Savitskiy A, Polokhin A, Gromov D. SERS of A-C thin film on ag, au, Ag<sub>0.52</sub>-Au<sub>0.48</sub> alloy nanoparticle arrays with normal particles size distribution formed by vacuum thermal evaporation. *Defect Diffus Forum.* 2018;386 DDF:250-5.
  12. Troyanchuk IO, Karpinsky DV, Tereshko NV, Bushinsky MV, Sikolenko VV, Gavrilov SA, Dubkov SV, Silibin MV. Ferromagnetic-antiferromagnetic transition and magnetotransport properties of La<sub>0.7</sub>Sr<sub>0.3</sub>Mn<sub>1-x</sub>Ni<sub>x</sub>O<sub>3</sub> perovskites. *Mater Res Express.* 2017;4(10)
  13. Gavrilin IM, Gromov DG, Dronov AA, Dubkov SV, Volkov RL, Trifonov AY, Borgardt NI, Gavrilov SA. Effect of electrolyte temperature on the cathodic deposition of ge nanowires on in and sn particles in aqueous solutions. *Semiconductors* 2017;51(8):1067-71.
  14. Gromov D, Dubkov S, Savitskiy A, Grishina Y, Rubtsov V. Investigation of Ag nanoparticles fusion process by subsequent vacuum thermal evaporation. In: *Proceedings of the 2017 IEEE Russia Section Young Researchers in Electrical and Electronic Engineering Conference, ElConRus 2017; 20172017.* p. 1156-9. 10.1109/ElConRus.2017.7910763
  15. Dubkov S, Trifonov A, Kitsyuk E, Pavlov A, Bulyarsky S, Skorik S, Maniecki T, Mierczynski P, Gromov D, Gavrilov S. CVD-growth of MWCNT arrays on Me-Ct-N(O) thin films. In: *Journal of Physics: Conference Series* DOI: 10.1088/1742-6596/829/1/012002
  16. Gromov DG, Bulyarskii SV, Dubkov SV, Pavlov AA, Skorik SN, Trifonov AY, Shulyat'ev AS, Shaman YP, Kitsyuk EP, Dudin AA, Sirotina AP, Gavrilov SA. CVD-growth of CNT with the use of catalytic Ct-Me-N-O thin films incorporated in the technology. *Russ Microelectr.* 2017;46(2):75-81.
  17. Grishina YS, Borgardt NI, Volkov RL, Gromov DG, Dubkov SV. Electron microscopy studies of crystallites in carbon nanopillars grown by low-temperature plasma-enhanced chemical-vapor deposition. *J Surf Invest.* 2017;11(1):226-33.
  18. Troyanchuk IO, Karpinsky DV, Silibin MV, Garvilov SA, Dubkov SV, Sikolenko VV. Magnetic properties, magnetoresistance and functionality of perovskite manganese oxides In: *Smart Materials for Smart Living ; 2017* p. 173-90.
  19. Mierczynski P, Shtyka O, Kozanecki M, Filipczak P, Maniukiewicz W, Gromov DG, Dubkov SV, Sysa AV, Trifonov AY, Czyrkowska A, Szyrkowska MI, Maniecki TP. Effect of the AACVD based synthesis atmosphere on the structural properties of multi-walled carbon nanotubes. *Arab J Chem* 2017
  20. Gromov DG, Dubkov SV, Pavlov AA, Skorik SN, Trifonov AY, Kirilenko EP, Shulyat'ev AS, Shaman YP, Rygalin BN. Formation of carbon nanotubes on an amorphous Ni<sub>25</sub>Ta<sub>58</sub>N<sub>17</sub> alloy film by chemical vapor deposition. *Semiconductors.* 2016;50(13):1748-52.
  21. Dubkov S, Trifonov A, Shaman Y, Pavlov A, Shulyat'Ev A, Skorik S, Kirilenko EP, Rygalin B. Growth of vertically aligned multiwalled carbon nanotubes forests on metal alloy Ni-Nb-N with low content of catalyst. In: *Journal of Physics: Conference Series* DOI: 10.1088/1742-6596/741/1/012030
  22. Gromov DG, Dubkov SV, Pavlov AA, Skorik SN, Trifonov AY, Shulyatev AS, Shaman YP, Rygalin BN. Use of thin film of a Co<sub>15</sub>Ti<sub>40</sub>N<sub>35</sub> alloy for CVD catalytic growth of carbon nanotubes. *Russ Microelectr.* 2016;45(2):98-104.
  23. Troyanchuk IO, Lobanovskii LS, Dubkov SV, Shilyaeva YI, Silibin MV, Gavrilov SA. Magnetic properties of cobaltites doped with chromium, gallium, and iron ions. *Phys Solid State.* 2016;58(2):293-5.
  24. Dubkov S, Bulyarskii S, Pavlov A, Trifonov A, Kitsyuk E, Mierczynski P, Maniecki T, Ciesielski R, Gavrilov S, Gromov D. The features of CNT growth on catalyst-content amorphous alloy layer by CVD-method. In: *Proceedings of SPIE - The International Society for Optical Engineering; DOI: 10.1117/12.2267052*
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27. Gromov DG, Savitskiy AI, Pavlova LM, Borgardt NI, Grishina YS, Dubkov SV, Trifonov AY. Formation of gold and silver cluster arrays using vacuum-thermal evaporation on a non-heated substrate. In: Proceedings of SPIE - The International Society for Optical Engineering: DOI: 10.1117/12.2180775
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29. Gromov DG, Borgardt NI, Volkov RL, Galperin VA, Grishina YS, Dubkov SV. Specific features of the structure and properties of carbon nanocolumns formed by low-temperature chemical vapor deposition. *Semiconductors.* 2013;47(13):1703-6.
30. Dubkov SV, Gavrilov SA, Gromov DG, Krasulin GA. Low-temperature process of the formation of tubular and graphene carbon structures. *Semiconductors.* 2011;45(13):1705-8.
31. Gromov DG, Gavrilov SA, Dubkov SV. Formation of carbonic nanostructures using PECVD and glow-discharge plasma at direct current. In: Proceedings of SPIE - The International Society for Optical Engineering DOI: 10.1117/12.854748
32. Gromov DG, Gavrilov SA, Redichev EN, Chulkov IS, Anisimov MY, Dubkov SV, Chulkov SI. Non-monotonic dependence of temperature of Au nanometer films dissociation into droplets on their thickness on Al<sub>2</sub>O<sub>3</sub> surface. *Appl Phys A.* 2010;99(1):67-71.