

Avtandil Tavkhelidze

Contact Details

Full name: Avtandil Tavkhelidze

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Gender: Male

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Citizenship: საქართველო

Country: საქართველო (Georgia)

(Georgia)

City: Tbilisi

Languages

Language	Writing	Reading	Speaking
ქართული (Georgian)	C1	C1	C1
Russian	C1	C1	C1
English	C1	C1	C1

Education

Academic degree

Academic Degree: Doctoral/PhD, Ed.D or other equivalent

Year obtained: 17.07.1991

Education

Academic Degree	Name of the Institution	Country	Major discipline	Start year	End year
Doctoral/PhD, Ed.D or other equivalent	Moscow State University	Russian Federation		1987	1991
Master/MS, MA, MR, MBA, m.Ed or other equivalent	Tbilisi State University			1977	

Trainings / Seminars / Training courses

Training / Seminar / The theme of the course	Organization name	Start year	End year
SDSU-Georgia Faculty Development Program	San Diego state University	2019	

Projects

Ongoing projects

Project title	Position	Project head	Start Date	Donor
Erasmus KA171, Learning mobility for higher education students and staff between Tuscia University (Italy) and Ilia State University (Georgia), 2022-1-IT02-KA171-HED-000078368,	Academic coordinator	Chiara Bandachini	01.09.2022	EU
Research and International Networking on Emerging Inorganic Chalcogenides for Photovoltaics (RENEW-PV)	Management Committee Member	Nicolae Spalatu	30.05.2022	European Cooperation in Science & Technology (COST)

Project title	Position	Project head	Start Date	Donor
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Completed projects

Project title	Position	Project head	Start Date	End Date	Donor
Demonstrating various configurations of semiconductor junctions through nanograting technique	Principal investigator	Avtandil Tavkhelidze	31.07.2020	01.11.2021	SRNSF and IBRD
Modernization of Environment Protection Studies Programmes for Armenia and Georgia	Coordinator	Avtandil Tavkhelidze	15.11.2018	15.11.2022	Erasmus KA2
Erasmus+, Staff mobility for teaching	Postdoc supervisor	Avtandil Tavkhelidze	01.10.2017	01.11.2017	Erasmus+
Electronic properties of nanograting layers	Scientific director	Avtandil Tavkhelidze	20.04.2016	20.04.2018	SCIENCE & TECHNOLOGY CENTER IN UKRAINE and RUSTAVELI NATIONAL SCIENCE FUND
Nanostructured materials for energy converters	Scientific director	Avtandil Tavkhelidze	05.05.2015	05.05.2017	Rustaveli National Science Foundation
Transport properties in nanostructured thermoelectrics	PhD supervisor	Avtandil Tavkhelidze	20.03.2015	20.03.2017	Rustaveli National Science Foundation
Nanostructured materials for optoelectronics and thermoelectrics	Scientific director	Avtandil Tavkhelidze	15.03.2014	15.03.2016	SCIENCE & TECHNOLOGY CENTER IN UKRAINE and RUSTAVELI NATIONAL SCIENCE FUND
Transport properties in nanostructured thermoelectrics	PhD supervisor	Avtandil Tavkhelidze	31.01.2014	31.01.2017	Juelich research center and Rustaveli National Science Foundation
Transport in nanostructured thermoelectrics	PhD supervisor	Avtandil Tavkhelidze	13.10.2013	13.10.2015	Rustaveli National Science Foundation
Industrial Cooperation and Creative Engineering Education based on Remote Engineering and Virtual Instrumentation	Georgian participant coordinator	Karsten Henke	10.10.2012	10.10.2015	EU Tempus programme

Scientific Fields (2018-2020)

Main Field

Field: 2. Engineering and technology

Sub-Field: 2.10 Nano-technology

Subject area: 2.10.1 Nano-materials [production and properties]

Additional Field (1)

Field: 1. Natural sciences

Sub-Field: 1.3 Physical sciences

Subject area: 1.3.2 Condensed matter physics (including formerly solid state physics, superconductivity)

Scientific Fields (2021-2024)

Main Field

Field: 1. Physical Sciences and Engineering

Employment History**Current place(s) of employment**

Workplace	Name of the work department	Position	Main responsibilities	Start Date
San Diego State University	Faculty of Engineering	Professor	Teaching	01.09.2019
Ilia State University	Faculty of business technologies and education	Professor	Teaching	15.08.2011

Work experience

Company/Institution	Name of the department	Position	Main responsibilities	Start Date	End Date
Borealis Technical Ltd	Avto Metals	Advanced projects manager	Research, management	01.01.1997	01.01.2006
Danish Technical University, Copenhagen	Physics Department	Guest Scientist	Research	01.01.1995	01.01.1998
Physical Technical Institute (PTB)	Metrology Centre	Guest scientist	Research	01.03.1994	01.04.1994
Paul Sheerer Institute	Particle Physics Department	Guest scientist	Research	10.03.1993	10.09.1993
Tbilisi State University	Faculty of Physics	Senior scientist	Research, teaching	01.01.1992	01.01.2010
Moscow State University	Chair of Nonlinear Oscillations	Scientist	Research	01.01.1986	01.01.1992
Joint Institute of Nuclear Research	Laboratory of Neutron physics	scientist	Research	01.01.1981	01.01.1984

Scientific Productivity**Patents**

Patent name	Issuing organization	Registration number	Year of Issue
MOS transistor on the basis of quantum interference effect,	US patent office	9,105,669	2015
Liquid metal contact as possible element for thermotunneling	US patent office	8,575,597	2013
Surface pairs	US patent office	8,574,663	2013
Method for modification of built in potential of diodes	US patent office	8,330,192	2012
Selective light absorbing semiconductor surface	US patent office	8,227,885	2012
Artificial band gap	US patent office	7,935,954	2011
Transistor on the basis of new quantum interference effect	US patent office	7,893,422	2011
An electrode pair precursor	UK patent office	GB2436246	2011
Process for making electrode pairs	US patent office	7,658,772	2010
Novel catalysts	US patent office	7,651,875	2010
Method of modification of built in potential of diodes	UK patent office	GB2438340	2010
Method for fabrication of separators for electrode pairs in diodes	US patent office	7,642,467	2010
Quantum interference device	US patent office	7,566,897	2009
Quantum interference transistor device	UK patent office	GB2452834	2009
Method of increasing efficiency of thermotunnel devices	US patent office	7,351,996	2008
Method for increasing efficiency of thermotunnel devices	US patent office	7,323,709	2008
Thermionic vacuum diode device with adjustable electrodes	US patent office	7,253,549	2007
Influence of surface geometry on metal properties	US patent office	7,220,984	2007
Fabrication of close-spaced MEMS devices by method of precise adhesion regulation	US patent office	7,208,021	2007
Thermionic vacuum diode device with adjustable electrodes	US patent office	7,169,006	2007
Artificial band gap	US patent office	7,166,786	2007
Electrode sandwich separation	US patent office	7,140,102	2006
Multiple tunnel junction thermotunnel device on the basis of ballistic electrons	EU patent office	EP1646830	2006

Patent name	Issuing organization	Registration number	Year of Issue
Influence of Surface Geometry on Metal Properties	US patent office	7,074,498	2006
Multiple Tunnel Junction Thermotunnel Device on the Basis of Ballistic Electrons	EU patent office	EP1646830	2006
Method for Fabrication of Separators for Electrode Pairs in Diodes	US patent office	6,971,165	2005
Method for increasing efficiency of thermotunnel devices	EU patent office	EP1565925	2005
Influence of surface geometry on metal properties	EU patent office	EP1492908	2005
Thermionic vacuum diode device with adjustable electrodes	EU patent office	EP1509940	2005
Thermotunnel material with integrated de Broglie wave filter	EU patent office	EP1586125	2005
Method for Making Electrode Pairs	US patent office	6,869,855	2005
Thermotunnel converter with spacers between the electrodes	US patent office	6,876,123	2005
Method for Making Diode Device	US patent office	6,774,003	2004
Thermionic vacuum diode device with adjustable electrodes	US patent office	6,720,704	2004
Artificial band gap	US patent office	6,680,214	2004
Method for Increasing Emission Through a Potential Barrier	US patent office	6,531,703	2003
Method for Increasing of Emission Through Potential Barrier	US patent office	6,495,843	2002
Method for Making Diode Device	US patent office	6,417,060	2002
Wafer having Smooth surface	US patent office	6,281,139	2001
Method for increasing of tunneling through potential barrier	US patent office	6,281,514	2001
Method for manufacturing low work function surfaces	US patent office	6,117,344	2000
Method for increasing of tunneling trough a potential barrier	EU patent office	EP1058947	2000
Diode Device	EU patent office	EP1018210	2000
Method for increasing of tunneling through potential barrier	World Intellectual Property Organization	WO/1999/040628	1999
Method for fabricating metal Nanostructures	World Intellectual Property Organization	WO/1999/064642	1999

Article / Monograph / Manual

Type	Authors	Publication title	Source title	Year
Article	N.T. Mamedov, E.H. Alizade, A.H. Bayramov, A. Tavkhelidze, D.A. Mammadov, J.N. Jalilli, Y.N. Aliyeva, Z.A. Jahangirli, L. Jangidze, N. Kitoshvili,	Free carrier plasma edge and plasmonic excitations in heavily doped surface grated n-type Si	Thin Solid Films, 139751	2023
Article	Z. Taliashvili, E Łusakowska, S. Chusnutdinov, A. Tavkhelidze, L. Jangidze, S. Sikharulidze, Nima E. Gorji, Z. Chubinidze & R. Melkadze,	Optical properties of periodically and aperiodically nanostructured p-n junctions	Optical and Quantum Electronics, v.55, 1028	2023
Article	A. Tavkhelidze, A. Bibilashvili, L. Jangidze, N.E. Gorji	Fermi-Level Tuning of G-Doped Layers	Nanomaterials 11, 505	2021
Article	A. Tavkhelidze, L. Jangidze, Z. Taliashvili, N.E. Gorji	G-doping based metal-semiconductor junction	Coatings, 11, 945	2021
Article	C.Samoila, D. Ursutiu, A. Tavkhelidze, L. Jangidze, Z. Taliashvili, G. Skhiladze and M. H. Tierean	Nanograting layers of Si	Nanotechnology 31 035301	2020
Article	A. Tavkhelidze	G-doping junction-formation mechanism	Semicond. Sci. Technol. 35 075005	2020
Article	A. Tavkhelidze, G. Grabecki, L. Jangidze, I. Yahniuk, Z. Taliashvili, and B. Taliashvili,	Negative Magnetoresistance in Si Nanograting Layers	Phys. Status Solidi A, 216, 1800693	2019
Article	A. Tavkhelidze, L. Jangidze and G. Skhiladze	G-doping based nanostructured p-p(v) junction	Mater. Res. Express, 6, 075049	2019
Article	A. Bayramov, E. Alizade, S. Mammadov, A. Tavkhelidze, N. Mamedov, Y. Aliyeva, K. Ahmedova, S. Asadullayeva, L. Jangidze, and G. Skhiladze	Optical properties of surface grated Si-based multilayer structure	J. Vac. Sci. Technol. B 37, 061807	2019
Article	A. Tavkhelidze, L. Jangidze, M. Mebonia, K. Piotrowski, J. Więckowski, Z. Taliashvili, G. Skhiladze and L. Nadaraia	Geometry-induced quantum effects in periodic nanostructures	Physica Staus Solidi A	2017
Article	D. Kakulia , A. Tavkhelidze, V. Gogoberidze, M. Mebonia	Density of quantum states in quasi-1D layers	Physica E	2016
Article	A. Tavkhelidze	Geometry-induced electron doping in periodic semiconductor nanostructures	Physica E	2014

Type	Authors	Publication title	Source title	Year
Article	Z. Taliashvili, A. Tavkhelidze, L. Jangidze, Y. Blagidze	Vacuum nanogap formation in multilayer structures by an adhesion-controlled process	Thin Solid Films	2013
Article	L. Jangidze, A. Tavkhelidze, Y. Blagidze, and Z. Taliashvili	Electroplating of Conformal Electrodes for Vacuum Nanogap Tunnel Junction	J. Electrochem. Soc.	2012
Article	A. N. Tavkhelidze	Nanostructured electrodes for thermionic and thermo-tunnel devices	J. Appl. Phys.	2010
Article	A. Tavkhelidze	Large enhancement of the thermoelectric figure of merit in a ridged quantum well	Nanotechnology	2009
Article	A. Tavkhelidze, V. Svanidze, and L. Tsakadze	Thermotunnel refrigerator with vacuum/insulator tunnel barrier: A theoretical analysis	J. Vac. Sci. Technol. A	2008
Article	A. Tavkhelidze, V. Svanidze and I. Noselidze	Fermi gas energetics in low-dimensional metals of special geometry	J. Vac. Sci. Technol. B	2007
Article	A. Tavkhelidze, A. Bibilashvili, L. Jangidze, A. Shimkunas, P. Mauger, G. F. Rempfer, L. Almaraz, T. Dixon and M. E. Kordesch	Observation of Quantum Interference Effect in Solids	J. Vac. Sci. Technol. B	2006

Scholarships and awards

Scholarships/awards name	Issuer	Year of Issue
Certificate of Appreciation	International Association of Advanced Materials	2018
IAAM Medal	International Association of Advanced Materials	2018
Academy award	National Science Academy of Georgia	2018
German Academic Exchange Service (DAAD A/13/03835)	German Academic Exchange Service (DAAD)	2013
Research scholarship	New York University	2008

Participation in scientific events

Scientific event name	Title of the presentation	Event venue	Year
The 25th International Conference ELECTRONICS 2021	Fermi Level Tuning by Nanograting Depth in Si Substrates	Palanga, Lithuania	2021
Materials science conference 2021 Australia	G-doping based Schottky Junction	Brisbane, Australia	2021
SiliconPV 2018 and the nPV Workshop 2018	Fabrication and Characterization of G-Doped Si Solar Cells	Laussane, Switzerland	2018
European Advanced Energy Materials and Technology Congress (AEMC-2018)	Fabrication and characterization of G-doped p-n junction	Stockholm, Sweden	2018
2017 International Conference on Innovative and Smart Materials	Electronic transport in periodic nanostructures	Paris, France	2017
25th Annual International Conference on Composites or Nano Engineering, ICCE-25	ELECTRONIC TRANSPORT IN Si NANOGRATING LAYERS	Rome, Italy	2017
17th International Conference on Gettering and Defect Engineering in Semiconductor Technology, GADEST 2017	Geometry-induced quantum effects in periodic nanostructures	Lopota, Georgia	2017
European Advanced Materials Congress (EAMC 2017)	Experimental study of geometry-induced doping in Si	Stockholm, Sweden	2017
EMN Dubai Meeting 2016	Observation of Geometry Induced Doping in Thin Si Nano-grating Layers	Dubay	2016
SiliconPV 2016 and the nPV Workshop 2016	Observation of Geometry Induced Doping in Thin Si Nanograting Layers	Chambery, France	2016

Productivity index

#	Citation index	h-index
Google scholar	1200.00	19.00