

Vladimer Chavchanidze  
Institute of Cybernetics

2013

Scientific report

Department of Mathematical Cybernetics

Planned and performed scientific-research works  
funded by the state budget of Georgia by 2013

#	Title of the work	Work Supervisor	Work Performers
1	Projectivity and unification in locally finite monadic MV-algebra	Prof. Revaz Grigolia	Revaz Grigolia, Ramaz Liparteliani
#	Title of the work	Work Supervisor	Work Performers
2	Graphics classification by using the pattern recognition system	Acad. Doctor N. Tkemaladze	V. JixvaSvili, M. Quridze, G. MamulaSvili

Stochastic Analysis and Mathematical Modeling Department

Planned and performed scientific-research works  
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#	Title of the work	Work Supervisor	Work Performers
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1	Development of modeling and predictive constructive methods of stochastic processes	Acad. Doctor Z. Piranashvili	Acad. Doctors: T.Sulaberidze, I.Sxirtladze, G.Bolqvadze, N.Khutsishvili, Scientific worker: Z.Alimbarashvili, R. Bakurtadze, N.Beqauri
#	Title of the work	Work Supervisor	Work Performers
2	The main task of mathematical finances	Acad. Doctor Revaz Tevzadze	Acad. Doctors: R.Tevzadze, B.CiqviniZe
#	Title of the work	Work Supervisor	Work Performers
3	Study of the scattered radiation characteristics in the upper layers of the atmosphere	Acad. Doctor G.Jandieri	Acad. Doctor G.Jandieri
#	Title of the work	Work Supervisor	Work Performers
4	Digital image segmentation and description of segments (performs with the Department of pattern recognition application system)	Acad. Doctor Tamaz Sulaberidze and Otar Tavidshvili	Acad. Doctors: T. Sulaberidze, O. Tavidshvili Scientific worker: Z.Alimbarashvili

### Department of Pattern Recognition Application System

#### Planned and performed scientific-research works financed by the state budget of Georgia by 2013

#	Title of the work	Work Supervisor	Work Performers
1	Processing of selective tea leaf plucking robot's test-demonstration	Goderzi Lejava Acad.doct.	Kamkamidze Irine Vardosanidze Angusi, Mkrtichiani Eduardi Berikishvili Zaira Dalaqishvili Tamari Beqauri Naira Nodia Shota

#	Title of the work	Work Supervisor	Work Performers
2	Research on the use of inductive output processor in hybrid intellectual systems	Goderzi Lejava Acad.doct.	Kamkamidze Irine Vardosanidze Angusi, Mkrtichiani Eduardi Berikishvili Zaira Dalaqishvili Tamari Beqauri Naira Nodia Shota
#	Title of the work	Work Supervisor	Work Performers
1	Prognosis for Gross Domestic Product of Georgia using ARIMA Methodology	<u>Avtandil KvitaSvili</u> Acad.doct.	Tkhinvaleli Rafael, Javakhishvili Irakli, Ananiashvili Gulaberi, Kandelaki Merabi, Tkeshelashvili Omar

**Department of Bio cybernetic Systems**

**Planned and performed scientific-research works  
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#	Title of the work	Work Supervisor	Work Performers
1	Investigation of penetration of electromagnetic fields in infrared fields in biological tissues	Acad.doct. B. Parcvania	Acad. Doctors: B. Parcvania , T. Gogoladze, T. Surguladze, T.Sulaberidze
#	Title of the work	Work Supervisor	Work Performers
2	Development of optimal system of orders issued by ultrasonic signals for using dolphins targetfully	Acad.doct. Tengiz Zorikov	Acad.doct. Tengiz Zorikov Rafiel Tkhinvaleli

**Department of Computing Technique Elements and Nanomaterials**

**Planned and performed scientific-research works  
financed by the state budget of Georgia by 2013**

#	Title of the work	Work Supervisor	Work Performers
1	Creating and research of single-dimensional phosphate nanomaterials	Prof. Davit Jishiashvili	Senior research worker. G. Shiolashvili Senior research worker. N. Makhatadze Senior research worker. L.Kiria Scientific worker. Al. Jishiashvili Leading engineer. D. Shukhanov
#	Title of the work	Work Supervisor	Work Performers
2	Synthesis of magnetic nanocomposites by biodegradable polymers PVA, PEG	Acad.doct. Shalva Kekutia	L. Saneblidze, J. Markhulia, V.Mikelashvili, R.Tatarashvili.
3	Hydride mobility and local fluctuations in amorphouse hydrocarbons	Ioseb Ratishvili (Institute of Physics) Natela Namoradze (Institute of Cybernetics)	Ioseb Ratishvili Natela Namoradze
4	Effect of nano insertions on YBCO superconductor's critical parameters	Revaz Kokhreidze, Acad. Doctor	Revaz Kokhreidze, Giorgi Mumladze, Jano Markhulia

**Department of Coherent Optics and Electronics**

**Planned and performed scientific-research works  
financed by the state budget of Georgia by 2013**

#	Title of the work	Work Supervisor	Work Performers
1	A Spectroscopy of tumor tissue fluorescence and light scattering	Acad. Doctor Zaza Melikishvili	Acad. Doctor Tamaz Modeidze Acad. Doctor Zaza Jaliashvili
#	Title of the work	Work Supervisor	Work Performers
2	Photonics of silver nanoparticles	Acad. Doctor Zaza Melikishvili (from the Institute of Cybernetics)	Acad. Doctor Tamaz Modeidze Acad. Doctor Zaza Jaliashvili
3	Acceleration of bismuth superconducting phase formation with nanoparticles doping	Acad. Dr. Nikoloz Margiani	Acad. Dr. Nikoloz Margiani
4	Solar controlled aggregates and luminescence in organic compounds	Acad. Doctor Tariel Ebralidze	Nadia Ebralidze, Giorgi Mumladze
5	Study of photophysical phenomena in photon structures	Acad. Dr. Giorgi Chanturia	Giorgi Chanturia, Robert Tatarashvili, Mary Turunava, Lia Kutaladze, Igor Masynikov, Aleksandre Tsatarov

**Laboratory of Holographic Recording and Processing of Information**  
**Planned and performed scientific-research works**  
**financed by the state budget of Georgia by 2013**

#	Title of the work	Work Supervisor	Work Performers
1	Developing a new, real-time polarimetric method for determining the distribution of the polarization of light obtained from astronomical objects (performed with Abastumani National Astrophysical Observatory)	Acad. Doctor Barbara Kilosanidze	Acad. Doctor Giorgi Kakauridze, Acad. Doctor Yuri Mshvenieradze, Acad. Doctor Irakli Chaganava, and Teimuraz Kvernadze, George Kurghuli (Abastumani National Astrophysical Observatory)
#	Title of the work	Work Supervisor	Work Performers
2	Development of theoretical and experimental methods of recording and restoring polarization holograms on the basis of polarized luminescence	AAcad. Doctor Vladimer Tarasashvili	Acad. Doctor Valentina Shaverova, Acad. Doctor Ana Purtseladze, Svetlana Petrová
#	Title of the work	Work Supervisor	Work Performers
3	Elaboration of a new method of polarization-holographic interferometry for registration of interferon using non-polarized light source	AAcad. Doctor Valentina Shaverdova	Acad. Doctor Vladimer Tarasashvili, Acad. Doctor Ana Purtseladze, Svetlana Petrová

**Department of Optically Controlled Anisotropic Systems**

**Planned and performed scientific-research works  
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#	Title of the work	Work Supervisor	Work Performers
1	Study of Laser Generating in Photonic Liquid Crystals	Andro Chanishvili and Zurab Vardosanidze	GGGG. Chilaya, M. Aronshidze, S.Tsazarashvili, Tevdorashvili
#	Title of the work	Work Supervisor	Work Performers
2	Photonic liquid crystal structures doped by silver and gold nanoparticles	Acad. Doctor Gia Petriashvili	Andro Chanishvili, Tsisana Zourabichvili, Nino Fonjavidze
3	Laser effects in paint doped gradient oriented polymeric systems	Zurab Vardosanidze	Zurab Vardosanidze Levan Nadareishvili Nona Topuridze Lia Sharashidze
4	Holographic diffraction elements based on the effect of Weigert	Zurab Vardosanidze	Zurab Vardosanidze
5	Dynamics of fluorescence polarization in quantum spots: research of optically inactive excitones' effect	EEE.Tsitsishvili	EEE.Tsitsishvili, H. Kalti (Germany)
6	Investigation of activation processes in nanostructural borosilic glasses	O. Gogolini	E.Tsitsishvili, R.Janelidze, I.Blagidze, G. Meshvelidze
7	Study of quantum point solar elements on the base of the III-V group semiconductors	T.Laperashvili	T.Laferashvili, O.Kvitsiani, J. Markhulia

## Laboratory of Optical-Chemical Research

### Planned and performed scientific-research works financed by the state budget of Georgia by 2013

#	Title of the work	Work Supervisor	Work Performers
1	The synthesis of long radical spirropinans and their optical-chemical research	Doctor of Chemistry Jimsher Maisuradze	Academic Doctors: Lali Devadze, Tsisana Zourabichvili, Izolda Mzhavanadze, Nino Sepashvili. Me. with. Shorena Akhobadze, Leading Injection Mzia Gugava