

## OLEG V. KOLOSOV

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### §1. CURRENT AND PAST POSTS

**Dec 2006 - present**     **Reader in Condensed Matter Physics**, Lancaster University, UK

**2003 – Dec 2006**     **Director, Innovation and Sensor Technology**,  
*Symyx Technologies, Santa Clara, CA, USA*

**2000 - 2002**     **Director, Polymer Properties Screening**,  
*Symyx Technologies, USA* (on research leave from Oxford University, UK)

**1999 – 2000**     **Group Leader**,  
*Symyx Technologies, USA* (on research leave from Oxford University, UK).

**1996 – 2002**     **Advanced EPSRC Fellow**,  
*Department of Materials, University of Oxford, UK*

**1996 - 2002**     **Research Fellow** of Wolfson College, Oxford University, UK

**1996 - 1999**     **Consultant**, *Symyx Technologies, USA.*

**1998**     **JSPS Senior Fellow**, Japanese Society of Promotion of Science, *Japan*

**1995 - 1999**     **Consultant**, Bede Scientific Instruments Ltd, *Durham, UK.*

**1996**     **Invited Professor** (Professeure Invité), *University of Montpellier II, France.*

**1994 – 1996**     **Research Fellow**,  
*Department of Materials, University of Oxford, UK*

**1994 – 1996**     **Visiting Scholar**, *Wolfson College, Oxford, UK*

**1992 – 1994**     **Fellow of Science and Technology Agency of Japan**,  
*National Institute for Advanced Intredisciplinary Research, Tsukuba, Japan*

**1982 – 1992**     **Junior Staff Scientist/ Staff Scientist**  
*Institute of Chemical Physics, Russian Academy of Sciences, Moscow, Russia*

### §2. ACADEMIC AND PROFESIONAL QUALIFICATIONS

**1989**     **Ph.D.** in Physics and Mathematics, Moscow Institute of Physics and Technology (Moscow PhysTech).

**1982**     **Diploma** (M.Sc, Summa Cum Laude, Honours) in Physics, Moscow PhysTech.

### §3. PROFESIONAL AND PERSONAL DEVELOPMENT (WHILST IN CURRENT POST)

#### Research projects development and income generation

Year	Research project	Role	Granting body	Resources
2011	GRaphenE for NANoscaled Applications (GRENADA)	PI	EC (FP7), Small and Medium Research Projects	€480,000
2011	FUNctional nanoscale PROBE (FUNPROBE)	PI	EC (FP7), Marie Curie Research Exchange	€58,000
2009	Materials World Network-- Ultrafast Switching of Phase Change Materials: Combined Nanosecond and Nanometer Exploration	PI	EPSRC(UK) - NSF(USA) EP/G06556X/1	£197,633

2011	Quasiparticle Imaging and Superfluid Flow Experiments at Ultralow	co-I	EP/I028285/1	£1,168,000
2009	Coupling of single quantum dots to two-dimensional systems	co-I	EPSRC	£294,745
2009	Non-Destructive Nanoscale Resolution using a Carbon Nanotube Scanning Thermal Probe.	PI	EPSRC	£356,000
2009	Single atomic layer material manipulation and characterization.	PI	Lancaster University Research Grant	£6,700
2008	Capacitive Force Microscopy	PI	Early Career Research Grant, Physics Department, Lancaster University.	£6,950
2007	Direct non-destructive imaging of blood vessels dynamic using optical coherence tomography	PI	Physics Department, FST, Lancaster University	£25k
2007	Pilot studies of graphene nanomechanics.	PI	Science and Technology Faculty, Lancaster University	£4k

#### External appointments

- 2006 – present      **External Examiner**, Department of Continuing Education, Oxford University, UK.  
2006 – present      **Member of Sci. Advisory Board**, Ampirica LLC and SEA Medical, USA.  
2006 – present      **Member of Sci. Advisory Board**, Anasys Instruments, USA & UK.  
2006 - 2008          **Consultant**, Symyx Technologies, USA.  
2001 - 2008          **Member of Grant Review Panel**, Research Grants Council, Hong Kong

#### Conference organization and editorial activities.

- 2011 –                **Editor** of MRS proceedings on *Advances of Spectroscopy and Imaging of Surfaces and Nanostructures*.  
2010 -                **Symposium Organiser and Chair, Sessions Chair, Awards Judge**, MRS Fall Meeting, Boston, USA.  
2010 – present      **Editor**, *Crystals*  
2011                  **Session Chair**, UK-Japan Graphene Workshop, Lancaster, UK  
2010                  **Session Chair**, MicroScience, London, UK.  
2010                  **Symposium Organiser and Chair, Sessions Chair**, ECOS 26 (European conference on surface science), Parma, Italy, **2009**.  
2003 - present      **Editor** *Journal of Nanobiotechnology*.

#### Recent invited talks.

- **Nanoscale probing of acoustic and thermal excitations transfer in nanoscale junctions via Ultrasonic Force and Scanning Thermal Microscopies**, Villa Conference on Interaction Among Nanostructures, Las Vegas, (2011).
- **Nanoscale subsurface and functional imaging with Scanning Probe Microscopy - from graphene layers to subsurface quantum dots**, Physics Department Colloquia, Leeds University, Leeds, UK (2011).
- **Nondestructive nanomechanical mapping of solid state materials by Ultrasonic Force Microscopy - from graphene layers to subsurface quantum dots**, MicroScience, London, UK (2010).
- **Material sensitive scanning probe microscopy of subsurface nanostructures via beam-exit Ar ion polishing**, Royal Microscopical Society, Cryomicroscopy Group, Birmingham, UK (2010).
- **Ultrasonic Force Microscopies**, Inst. of Physyics, Lancashire-Cumbria Branch, UCLAN, Preston, UK (2010).
- **Ultrasonic Force Microscopy to explore nanometre length and nanosecond time scale physical phenomena**, *Departmental Colloquium*, Department of Engineering, Glasgow University, UK (2009).
- **Nano thermal analysis: chemical and bio-medical applications**, *Gordon Research Conference - Photoacoustic & Photothermal Phenomena*, Crowne Plaza, Ventura, CA, 10-15 February (2008).
- **Atomic force microscopy with ultrasonic excitation - direct subsurface imaging of iii-v semiconductor nanostructures**, KU Leuven, Physics Department Invited Lecture, February (2008).
- **Subsurface imaging using Ultrasonic Force Microscopies**, VEECO-Digital Instruments, February (2008).

- **Merging nanoscale space and nanosecond time resolution for materials characterization**, *Oxford Materials Colloquia*, Oxford University, Department of materials, April (2007).

### Professional affiliations

2010 – present	Member of the Institute of Physics
2010 – present	Member of Materials Research Society
1994 - 2008	Member of American Physical Society (APS)
2001-2007	Member of American Chemical Society

### Professional development

2007-2008	Certificate in Academic Practice, Lancaster University, UK.
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## §4. TEACHING

### Undergraduate teaching.

- Convenor of core theoretical course for Y3 MPhys and BSc students (PHYS322 – *Statistical Physics*). Introduced on-screen writing tablet PC technology accompanied with dedicated derivation sheets for theoretical derivations.
- Convenor of options course for Y3/Y4 Physics and M.Sc. in Biophotonics students (PHYS385 – *Advanced Microscopy and Spectroscopy*) wholly new course to Physics that I proposed and designed through 2007, and first run in 2008/2009 acad. year. Currently being updated as *Advanced Nanoscale Microscopy* reflecting employment and field development trends.
- Member of final year Exam Committee, responsible for ~ 25% of final year exam papers.
- Supervisor of M.Phys. projects and thesis for 4<sup>th</sup> year Physics students.

### Postgraduate teaching and examinations.

<b>Current PhD students</b>	Peter Tovee, Ilja Grishin, Riccardo Mazzocco, Suhir Abuhidjar, Claire Tinker.
<b>Graduated PhD students</b>	Olaug Grude (Lancaster), Franco Dinelli, Mar Puentes Heras, Else Erikksen (Oxford University) students
<b>External Examiner,</b>	PgCert in nanotechnology, Department of Continuing Education, Oxford Univ, UK. Postgraduate Degree course.
<b>Ph.D. External Examiner</b>	(Graphene group) Manchester University, UK. (SPM group) Leeds University, UK.
<b>Ph.D. Internal Examiner</b>	Lancaster University, UK

### Accomplishments in teaching.

2011 -	Supervised by me 2nd year Ph.D. student was awarded <b>2011 FST Deans Award</b> for excellence in Ph.D. studies.
2010	Supervised by me 4 <sup>th</sup> year M.Phys. undergraduate physics project student was nominated for <b>Science Engineering and Technology (SET) Award</b> for the Physics Student of the Year, UK

## §5. RESEARCH AND SCHOLARLY WORK

### a. *Papers in peer reviewed journals (marked \*) and expert examined and awarded patents (marked †).*

1. \*(submitted) P. Tovee, M. Pumarol, D. Zeze, Kevin Kjoller, and O. Kolosov, **Nanoscale spatial resolution probes for Scanning Thermal Microscopy of solid state materials**, (submitted to PRB, <http://arxiv.org/abs/1110.6055v1>, 2011).
2. \*(submitted) D.I. Bradley, M. Clovecko, S.N. Fisher, D. Garg, E. Guise, R.P. Haley, O. Kolosov, G.R. Pickett and V. Tsepelin, D. Schmoranzler, L. Skrbek, **Crossover from hydrodynamic to acoustic drag on quartz tuning forks in normal and super liquid 4He** (submitted to PRB, 2011).
3. \*(submitted) Manuel E. Pumarol, Peter Tovee, Mark C. Rosamond, Michael C. Petty, Dagou A. Zeze, Vladimir Falko, and Oleg V. Kolosov, **Direct nanoscale imaging of ballistic and diffusive thermal transport in graphene** (submitted to Nature Materials, 2011).
4. \*Mark C. Rosamond, Andrew J. Gallant, Michael C. Petty, Oleg Kolosov and Dagou A. Zeze, **A versatile nanopatterning technique based on controlled undercutting and liftoff**, <http://dx.doi.org/10.1002/adma.201102708>, Advanced Materials, (2011).
5. \*Kolosov, O.V., Grishin, I., & Jones, R., **Material sensitive scanning probe microscopy of subsurface semiconductor nanostructures via beam exit Ar ion polishing**, Nanotechnology 22 (18), 8 (2011).

6. \*F.Dinelli, C. Albonetti, O. V. Kolosov, **Ultrasonic force microscopy: Detection and imaging of ultra-thin molecular domains**, Ultramicroscopy, pp. 267-272, **111**, Issue 4 (2011).
7. \*D.I. Bradley, P. Crookston, M. J. Fear, S. N. Fisher, G. Foulds, D. Garg, A. M. Guénault, E. Guise, R. P. Haley, O. Kolosov, G. R. Pickett, R. Schanen and V. Tsepelin, **Measuring the Prong Velocity of Quartz Tuning Forks Used to Probe Quantum Fluids**, JLTP, **161** #5/6, December (2010).
8. \*Kamarudin, MA, Hayne, M Zhuang, QD Kolosov, O; Nuytten, T Moshchalkov, Dinelli, F, **GaSb quantum dot morphology for different growth temperatures and the dissolution effect of the GaAs capping layer** JOURNAL OF PHYSICS D-APPLIED PHYSICS Volume: 43 Issue: 6 Article Number: 065402 DOI: 10.1088/0022-3727/43/6/065402 (2010)
9. †Oleg Kolosov, Leonid Matsiev, John F. Varni, G. Cameron Dales, Olaf Ludtke (Hella), Dirk Wullner (Hella), Andreas Buhrdorf (Hella), Heiko Dobrinski (Hella) **Resonator Sensor Assembly**, USA Patent, **US 7,721,590** (2010).
10. \*V. B. Efimov, Deepak Garg, O. Kolosov and P. V. E. McClintock, **Direct measurement of the critical velocity above which a tuning fork generates turbulence in superfluid helium**, JLTP p. 456 **158**, #3/4 February (2010).
11. †Burdett Ian; Lynn Timothy; Kolosov Oleg; Zilker Daniel Paul Jr; Matsiev Leonid **Systems And Methods For Monitoring Solids Using Mechanical Resonator**. US Patent, **US 7,634,937** (2009).
12. †Bennett J., Kolosov O., Matsiev L., **Flexural resonator sensing device and method**, USA Patent, **US 7,562,557** (2009).
13. †Cypes S., Uhrich M., Carlson E., Kolosov O., Padowitz D., Bennett J., Matsiev L., **Monitoring and controlling unit operations**, US patent **7,603,889** (2009).
14. †Matsiev L., Kolosov O., Uhrich M., Rust W., Feland J., Varni J., Walker B., **Environmental control system fluid sensing system and method**, USA Patent, **US 7,350,367** (2008).
15. †Matsiev Leonid, Bennett; James, Pinkas; Daniel M., Spitkovsky; Mikhail, Kolosov; Oleg, Guan; Shenheng, Uhrich; Mark, Dales; G. Cameron, Varni; John F., Walker; Blake, Gammer; Vladimir, Padowitz; Dave, Low; Eric, Machine fluid sensor, USA Patent, **US 7,254,990** (2007).
16. †Kolosov; Oleg V. Matsiev; Leonid Spitkovsky; Mikhail B. Gammer; Vladimir, **Application specific integrated circuitry for controlling analysis of a fluid**, USA Patent, **7,225,081**, (2007).
17. †Kolosov, Oleg; Matsiev, Leonid; Petro, Miroslav. **Flow detectors having mechanical oscillators, and use thereof in flow characterization systems**, USA Patent, **US 7,302,830** (2007)
18. †Kolosov; Oleg, Matsiev; Leonid, Padowitz; David, **Mechanical resonator**, USA Patent, **US 7,210,332**, (2007).
19. †Carlson Eric D., Kolosov; Oleg, Matsiev; Leonid, High throughput microbalance and methods of using same, USA Patent, **US 7,207,211**, (2007).
20. †Kolosov; Oleg V., Matsiev; Leonid, Spitkovsky; Mikhail B., Gammer; Vladimir, Integrated circuitry for controlling analysis of a fluid, USA Patent **US 7,158,897** (2007).
21. †James Bennett, G. Cameron Dales, John M. Feland III, Oleg Kolosov, Eric Low, Leonid Matsiev, William C. Rust, Mikhail Spitkovsky, Mark Uhrich **Portable Fluid Sensing Device and Method** , USA Patent, **US 7,272,525** (2007).
22. †Hajduk; Damian A., Kolosov; Oleg, **High throughput permeability testing of materials libraries**, USA Patent, **US 7,112,443** (2006).
23. †Matsiev; Leonid, Bennett; James, Pinkas; Daniel M., Spitkovsky; Mikhail, Kolosov; Oleg, Guan; Shenheng, Uhrich; Mark, Dales; G. Cameron, Varni; John F., Walker; Blake, Gammer; Vladimir, Padowitz; Dave, Low; Eric, **Machine fluid sensor and method**, USA Patent, **US 7,043,969**, (2006).
24. †Matsiev; Leonid, Bennett; James, Pinkas; Daniel M., Spitkovsky; Mikhail, Kolosov; Oleg, Guan; Shenheng, Uhrich; Mark, Dales; G. Cameron, Varni; John F., Walker; Blake, Gammer; Vladimir, Padowitz; Dave, Low; Eric, **Machine fluid sensor and method**, CA Patent, **CA 2,499,298**, (2006).
25. †Hajduk; Damian A., Kolosov; Oleg, High throughput preparation and analysis of plastically shaped material samples, USA Patent, **US 7,013,709**, (2006).
26. \*H. Dobrinski, A. Buhrdorf, O. Lütke, O. Kolosov, Z. Bryning, J. Bennett und M. Uhrich, **Integrated Tuning Fork Based Microsensor for Multiparametric Oil Condition Testing** (in German) „Hochintegrierter Mikrosensor auf Basis eines Tuning-Fork-Quarzresonators zur multiparametrischen Ölzustandsanalyse in Automobilanwendungen“, in book „Sensoren im Automobil“ 2006, editor Dr. Thomas Tille, BMW AG, publisher Expert Verlag GMBH, Germany (2006).
27. †Oleg Kolosov, Leonid Matsiev, Mikhail Spitkovsky, Vladimir Gammer, **Application Specific Integrated Circuitry For Controlling Analysis For a Fluid**, USA Patent, **US 6,873,916** (2005).
28. \*Petro, Miroslav; Nguyen, Son Hoai; Liu, Mingjun; Kolosov, Oleg. **Combinatorial exploration of polymeric transport agents for targeted delivery of bioactives to human tissues**, Macromolecular Rapid Communications 25(1), 178-188. (2004).

29. †Eric D. Carlson, Oleg Kolosov, Leonid Matsiev, Laura T. Mazzola, Mikhail Spitkovsky, John Gallipeo, **High Throughput Microbalance And Methods of Using Same**, USA Patent, **US 6,928,877**, (2005).
30. †Eric D. Carlson, Oleg Kolosov, Leonid Matsiev, Laura T. Mazzola, Mikhail Spitkovsky, John Gallipeo **High Throughput Microbalance And Methods of Using Same**, European Patent, **EP 1,537,403** (2005).
31. †Damian Hajduk, Eric D. Carlson, J. Christopher Freitag, Oleg Kolosov, James R. Engstrom, Adam Safir, Ravi Srinivasan, Leonid Matsiev, **Instrument For High Throughput Measurement Of Material Physical Properties And Method Of Using Same**, USA Patent, **US 6,936,471**, (2005).
32. †Damian Hajduk, Eric D. Carlson, J. Christopher Freitag, Oleg Kolosov, **Instrument For High Throughput Measurement Of Material Physical Properties And Method Of Using Same**, Canada Patent, **CA 2,344,755** (2004).
33. †Hajduk; D. A.; Carlson; E. D.; Freitag; J. C.; Kolosov; O. **Instrument for high throughput measurement of material physical properties of a plurality of samples**, USA Patent, **US 6,679,130** (2004).
34. †Hajduk; D. A.; Carlson; E. D.; Freitag; J. C.; Kolosov; O. **Equipment and Apparatus for high throughput measurement of material physical properties of a plurality of samples**, Japan Patent, **JP 3,543,088** (2004).
35. †Hajduk; D. A.; Carlson; E. D.; Freitag; J. C.; Kolosov; O.; Engstrom; James R.; Safir; A.; Srinivasan; R.; Matsiev; L., **High throughput mechanical property and bulge testing of materials libraries**, USA Patent, **US 6,772,642** (2004).
36. †Hajduk D. A.; Carlson E. D.; Freitag J. C.; Kolosov O.; Engstrom J. R.; Safir A.; Srinivasan R.; Matsiev L., **High throughput mechanical property testing of materials libraries using capacitance**, USA Patent, **US 6,690,179** (2004).
37. †Hajduk D. A.; Carlson; E. D. Freitag; J. C. Kolosov O.; Engstrom J. R.; Safir A.; Srinivasan R.; Matsiev L., **High throughput mechanical property testing of materials libraries using a piezoelectric**, USA Patent, **US 6,650,102**, (2004).
38. \*Petro, Miroslav; Nguyen, Son Hoai; Liu, Mingjun; Kolosov, Oleg. **Combinatorial exploration of polymeric transport agents for targeted delivery of bioactives to human tissues**. *Macromolecular Rapid Communications* 25(1), 178-188. (2004).
39. \*Szozkiewicz, R.; Huey, B. D.; Kolosov, O. V.; Briggs, G. A. D.; Gremaud, G.; Kulik, A. J. **Tribology and ultrasonic hysteresis at local scales**. 210(1-2), 54-60. *Applied Surface Science* (2003).
40. †Hajduk; D. A.; Carlson; E. D.; Freitag; J. C.; Kolosov; O. **Instrument for high throughput measurement of material physical properties and method of using the same**, USA Patent, **US 6,664,067** (2003).
41. \*Berezina, S.; Kolosov, O.; Slabeycius, J., **Investigation of local mechanical properties of Al-Cu-Li alloys by acoustic microscope**, *Komunikacie* 5(2), 26-28. (2003)
42. \*Tomoda, M.; Shiraishi, N.; Kolosov, O. V.; Wright, O. B. **Local probing of thermal properties at submicron depths with megahertz photothermal vibrations**. *Applied Physics Letters* 82(4), 622-624. (2003)
43. \*Tomoda, M.; Shiraishi, N.; Inagaki, K.; Kolosov, O. V.; Wright, O. B. **Subsurface mapping of thermal properties with optical heterodyne force microscopy**. *Review of Scientific Instruments* (2003), 74(1, Pt. 2), 373.
44. \*Geer, R. E.; Kolosov, O. V.; Briggs, G. A. D.; Shekhawat, G. S. **Nanometer-scale mechanical imaging of aluminum damascene interconnect structures in a low-dielectric-constant polymer**. *Journal of Applied Physics* 91(7), 4549-4555. (2002)
45. \*McGuigan, A. P.; Huey, B. D.; Briggs, G. A. D.; Kolosov, O. V.; Tsukahara, Y.; Yanaka, M. **Measurement of debonding in cracked nanocomposite films by ultrasonic force microscopy**. *Applied Physics Letters* 80(7), 1180-1182. (2002)
46. \*Porfyraakis, K.; Kolosov, O. V.; Assender, H. E. **AFM and UFM surface characterization of rubber-toughened poly(methyl methacrylate) samples**. *Journal of Applied Polymer Science* 82(11), 2790-2798. (2001)
47. \*Cuberes, M. T.; Briggs, G. A. D.; Kolosov, O. **Nonlinear detection of ultrasonic vibration of AFM cantilevers in and out of contact with the sample**. *Nanotechnology* 12(1), 53-59. (2001)
48. \*Charmot, Dominique; Mansky, Paul; Kolosov, Oleg; Benoit, Didier; Klarner, Gerrit; Jayaraman, Mani; Piotti, Marcelo; Chang, Han Ting; Nava-Salgado, Victor. **High throughput synthesis and screening in specialty polymers applications**. *Polymer Preprints (American Chemical Society, Division of Polymer Chemistry)* 42(2), 627-628 (2001)
49. \*Deng, C.-S.; Assender, H. E.; Dinelli, F.; Kolosov, O. V.; Briggs, G. A. D.; Miyamoto, T.; Tsukahara, Y. **Nucleation and growth of gas barrier aluminium oxide on surfaces of poly(ethylene terephthalate) and polypropylene: effects of the polymer surface properties**. *J. Polym. Sci., Part B: Polym. Phys.* 38(23), 3151-3162. (2000)
50. \*Dinelli, F.; Biswas, S. K.; Briggs, G. A. D.; Kolosov, O. V. **Measurements of stiff-material compliance on the nanoscale using ultrasonic force microscopy**. *Phys. Rev. B: Condens. Matter Mater. Phys.* 61(20), 13995-14006. (2000).
51. \*Cuberes, M. T.; Assender, H. E.; Briggs, G. A. D.; Kolosov, O. V. **Heterodyne force microscopy of PMMA/rubber nanocomposites: nanomapping of viscoelastic response at ultrasonic frequencies**. *J.Phys. D: Appl. Phys* 33(19), 2347-2355, (2000).

52. \*Lefeuvre, O.; Kolosov, O. V.; Every, A. G.; Briggs, G. A. D.; Tsukahara, Y. **Elastic measurements of layered nanocomposite materials by Brillouin spectroscopy**. Ultrasonics 38(1-8), 459-465 (2000).
53. \*Inagaki, K.; Kolosov, O. V.; Briggs, G. A. D.; Wright, O. B., **Waveguide ultrasonic force microscopy at 60 MHz**, Appl. Phys. Lett. 76 (14), 1836-1838 (2000).
54. \*Dinelli, F.; Castell, M. R.; Ritchie, D. A.; Mason, N. J.; Briggs, G. A. D.; Kolosov, O. V. **Mapping surface elastic properties of stiff and compliant materials on the nanoscale using ultrasonic force microscopy**, Philos. Mag. A 80 (10), 2299-2323 (2000).
55. \*I. Pape, C.W. Lawrence, P.D. Warren, S.G. Roberts, G.A.D. Briggs, O.V. Kolosov, A.W. Hey, C. F. Paine and B K Tanner, **Evaluation of polishing damage in alumina**, Phil. Mag., 80, 1913-1934 (2000).
56. \*Hurley, D.H.; Wright, O.B.; Matsuda, O.; Gusev, V.E.; Kolosov, O.V., **Laser picosecond acoustics in isotropic and anisotropic materials**; Ultrasonics, vol.38, no.1-8, Page: 470-4, (2000).
57. \*Grier, E. J.; Kolosov, O.; Petford-Long, A. K.; Ward, R. C. C.; Wells, M. R.; Hjorvarsson, B., **Structural changes to epitaxial (0001) holmium layers during hydrogen loading**, J. Phys. D: Appl. Phys. 33 (8), 894-900. (2000).
58. \*Dinelli, F.; Assender, H. E.; Kirov, K.; Kolosov, O. V., **Surface morphology and crystallinity of biaxially stretched PET films on the nanoscale**, Polymer 41 (11), 4285-4289 (2000).
59. \*Henry, B. M.; Dinelli, F.; Zhao, K. -Y.; Grovenor, C. R. M.; Kolosov, O. V.; Briggs, G. A. D.; Roberts, A. P.; Kumar, R. S.; Howson, R. P., **A microstructural study of transparent metal oxide gas barrier films**, Thin Solid Films 355-356 500-505. (1999).
60. \*Dinelli, F.; Assender, H. E.; Takeda, N.; Briggs, G. A. D.; Kolosov, O. V., **Elastic mapping of heterogeneous nanostructures with ultrasonic force microscopy (UFM)**, Surf. Interface Anal. 27(5-6), 562-567, (1999).
61. \*O.V. Kolosov, M.R. Castell, C.D. Marsh, G.A.D. Briggs, T.I. Kamins, R.S. Williams, **Imaging the elastic nanostructure of Ge islands by ultrasonic force microscopy**, Physical Review Letters, Vol. 81, No.5, pp.1046-1049. (1998).
62. \*A. Briggs and O. Kolosov, **Anisotropic elastic characterization of surfaces from 2 MHz to 20 GHz**, Ultrasonics Vol.36, No.1-5, pp.317-321., (1998).
63. \*O. Kolosov, **Ultrasonic Force Microscopy**, feature paper (invited), Materials World, December, P.753-754, (1998).
64. \*Graciun, F.; Verardi, P.; Dinescu, M.; Dinelli, F.; Kolosov, O., **Early stages of growth and nanostructure of Pb(Zr,Ti)O<sub>3</sub> thin films observed by atomic force microscopy**, Thin Solid Films 336(1,2), 281-285. (1998)
65. \*F. Dinelli; S. Biswas; A. Briggs and O. Kolosov, **Ultrasound induced lubricity in microscopic contact**, Appl. Phys. Lett., 71 (9), 1177-1179 (1997).
66. \*O. Kolosov, **Ultrasonic scanned force microscopy**, feature paper (invited), Vision, the Newsletter of the Scanning Probe Microscopy Programme, EPSRC, spring issue, p.1,8 (cover). (1997).
67. \*Warren, P. D.; Lawrence, C. W.; Roberts, S. G.; Briggs, G. A. D.; Pecorari, C.; Kolosov, O. V.; Puentes-Heras, M. M., **Evaluation of lapping and polishing damage in brittle materials by quantitative acoustic microscopy**, Br. Ceram. Proc. 57 (Advances in the Characterisation of Ceramics), 167-176, (1997).
68. \*A. S. Chekanov; T. S. Low; S. Alli; O. Kolosov; A. Briggs, **Microcracks of the Thin-Film Head Alumina - L Cracks and U Cracks**, IEEE Transactions On Magnetics, 32 (5), 3696-3698 (1996).
69. \*S. Chekanov; S. Alli; O. Kolosov, **Application of SPM for the Analysis of Microcracks of Thin-Film Head Alumina**, Nato Advanced Science Institutes Series, Series E, Applied Sciences, 330 663-668 (1996).
70. \*A. Briggs and O. Kolosov, **Acoustic Microscopy for Imaging and Characterization**, (invited) MRS Bulletin, v. 21, , p.30-35, (1996).
71. \*O. Kolosov, **Nanoscale Visualization And Control Of Ferroelectric Domains By Atomic-Force Microscopy - Reply**, Physical Review Letters, Vol.76, No.22, p.4292, (1996).
72. \*P.D. Warren, O.V. Kolosov, C. Pecorari, S.G. Roberts and G.A.D. Briggs, **Characterisation of surface damage via contact probes**, Nanotechnology, v.7, p.288-294 (1996).
73. \*P.D. Warren, C. Pecorari, O.V. Kolosov, C S.G. Roberts and G.A.D. Briggs, **Characterisation of surface damage via surface acoustic waves**, Nanotechnology, v.7, p.295-301, (1996).
74. \*O. Kolosov, A. Gruverman, J. Hatano, K. Takahashi, and H. Tokumoto, **Visualization and Control of Ferroelectric Domains at Nanoscale by Atomic Force Microscopy**, Physical Review Letters, 74 4309-4312, (1995).
75. \*A. Gruverman, O. Kolosov, J. Hatano, K. Takahashi, and H. Tokumoto, **Domain structure and polarization reversal in ferroelectrics studied by atomic force microscopy**, J.Vac.Sci.Technolo. B 131095-1099, (1995).
76. \*P. Zinin, W. Weise, O. Lobkis, O. Kolosov, S. Boseck, **Fourier Optics Analysis of Spherical Particles Image Formation in Reflection Acoustic Microscopy**, Optic, 98 45-60, (1994).
77. \*Kolosov O.V., Suzuki M., Yamanaka K. **Microscale Evaluation of the Local Viscoelastic Properties of Polymer Gel for Artificial Muscles Using Acoustic Microscopy**, J. Appl. Phys., 74, pp.6407-12, (1993).

78. \*K. Yamanaka, O. Kolosov, H. Ogiso, **Ultrasonic Force Microscopy of Byopolymers at Frequencies Above 100 MHz**, in *Nanostructures & Quantum Effects*, Springer-Verlag pp. 345-348, (1994).
79. \*O. Kolosov, H. Ogiso, H. Tokumoto, K. Yamanaka, **Elastic Imaging with Nanoscale and Atomic Resolution by Ultrasonic Force Microscopy (UFM)**, in *Nanostructures & Quantum Effects*, Springer-Verlag, pp.349-352, (1994).
80. †Yamanaka I., Kolosov O. V., Ogiso H., Sato H., Koda T., **Interatomic Force Microscope and Sample Observing Method Thereof**, No. K-2711, priority **13.05.93**, (5-135342), 6-323834A, Patent of Japan, **JP 2,535,759 (1994)**.
81. †Kolosov O. V., Yamanaka K., Watanabe K., **Ultrasonic oscillation detection method and sample observing method in atomic force microscope**, No. K-2712, priority 12.05.93, F1909, 6323843, Patent of Japan, **JP 7,092.464 (1994)**.
82. \*P. Zinin, O. Kolosov, O. Lobkis, K. Maslov, **Visualisation of spherical objects by the reflection acoustic microscope**, *Physical Acoustics*, **39 (1993)** 343-346.
83. \*K. Yamanaka, H. Ogiso, and O. Kolosov, **Ultrasonic Force Microscopy for nanometer resolution subsurface imaging**, *Appl. Phys. Lett.* **64** No.2 pp.178-180, **1994**.
84. \*H. Sato, O. Kolosov, Y. Nagata, T. Koda, and K. Yamanaka, **Acoustic Imaging of Plate Thickness and Sound Velocity during Tensile Testing at Low T**, *Japanese J. Appl. Phys.* **33 (1994)** 6373-6378.
85. \*K. Yamanaka, H. Ogiso, and O. Kolosov, **Analysis of subsurface imaging and effect of contact elasticity in the Ultrasonic Force Microscope**, *Japanese J. Appl. Phys.* **33 (1994)** pp. 3197-3203.
86. \*Kolosov O. V., Yamanaka K., **Acoustic Knife Edge for Anisotropic and Dark Field Acoustic Imaging and Measurements**, *Japanese J. of Appl. Phys.*, **33** Pt.1 No.1a, pp.329-333 (1994).
87. \*Yamanaka K. , Kolosov O. , Nagata Y. , Koda T., Nishino H., and Tsukahara Y., **Analysis of excitation and coherent amplification of surface acoustic waves by the phase velocity scanning method**, *J. Appl. Phys.*, **74** No.11 pp.6511-6522, (1993).
88. \*Kolosov O. V. and Yamanaka K., **Nonlinear Detection of Ultrasonic Vibrations in an Atomic Force Microscope**, *Japanese J. Appl. Phys. Lett.*, **32** Part.2 (Letters), No.8A, pp.L1095-L1098, (1993).
89. \*Kolosov O. V., Levin V. M., Mayev R. G., Senjushkina T. A., **The Use of the Acoustic Microscopy for Biological Tissues Characterization**, in *Selected Papers on Scanning Acoustic Microscopy*, ed-s. B. Khuri-Yakub and C. Quate, SPIE Milestone Series, v.53, ISBN 0-8194-0981-2, p. 290-298, (1992).
90. \*Kolosov O.V., Lobkis O.I., Maslov K.I., Zinin P.V., **The Effect of Focal Plane Position on the Image of Spherical Object in the Acoustic Microscope**, *Acoustics Letters*, v.16, No.4, pp.84-88, (1992).
91. \*O.V. Kolosov, M. Suzuki, K. Yamanaka, **Micromechanical Characterization of the Polymer Gel for Artificial Muscles**, (in Japanese), *MEL NEWS (J. Mech. Engn. Lab.)*, No.10, MITI, Japan, pp.4-5, (1992).
92. \*R.G. Mayev, O.V. Kolosov, O.I. Lobkis, **Investigation of the Confocal System of the Transmission Acoustic Microscope**, *Trans. of the Royal Microsc. Society*, London, UK, v.1, pp.107-110, (1990).
93. †Kolosov O. V., Matsyev L. F., Mayev R. G., Esskov Yu. B., Bondarenko Yu. K., Troitskiy V. A., **Method of Layer Materials and other Objects Investigation by Using the Acoustic Microscope**, *USSR Patent 1587337*, prior. 03.05.88, publ. *USSR Pat. Bull.*, No.31, (1990).
94. †Kolosov O. V., Matsyev L. F., Maev R. G., Lagutenkova E. Yu., Senyushkina T. A., Pyshniy M. F., **Method of the Investigation of Inner Structure of the Objects in the Transmission Acoustic Microscope**, *USSR Patent 1409915*, prior. 03.05.88, published *USSR Pat. Bull.*, No.26 (1988).
95. \*Levin V. M., Maev R. G., Kolosov O. V., Bukhny M., **Theoretical Fundamentals of Quantitative Acoustic Microscopy**, *Acta Phys. Slovaca*, v.40, No. 3, pp.171-184, (1990).
96. \*Enikolopyan N. S., Kolosov O. V., Lagutenkova E. Yu., Mayev R. G., Novikov D. D., **Scanning Acoustic Microscopy Study of the Heterogeneity of Polymer Mixtures**, *Soviet Physical Chemistry*, Plenum Publishing Corporation, v.292, No.2, pp.213-216, (1987).
97. \*Enikolopyan, N. S.; Kolosov, O. V.; Lagutenkova, E. Yu.; Maev, R. G.; Novikov, D.D., **Study of the heterogeneity of polymer mixtures by scanning acoustic microscopy**, *Dokl. Akad. Nauk SSSR*, 292(6), 1418-22 [Phys. Chem.], (1987).
98. \*Kolosov O. V., Levin V. M., Mayev R. G., Senyushkina T. A., **Acoustic Microscopy of Collagen Tissues** in book: "Biomechanics in medicine and Surgery", Kaunas, Lithuania, USSR (in Russian, abstr. in English), v.1, pp.200-205, (1987).
99. \*Kolosov O. V., Levin V. M., Mayev R. G., Senjushkina T. A., **The Use of the Acoustic Microscopy for Biological Tissues Characterization**, *Ultras. in Medicine and Biology*, v.13, No.8, pp.477-483, (1987).
100. \*Pirusian L. A., Kolosov O. V., Mayev R. G., Levin V. M., Senyushkina T. A., **Acoustic Microscopy of Organic and Biological Materials**, *Sov. Phys. Dokl.*, ©Amer. Inst. of Phys., v.30, No2, pp.150-2, (1985).

**b. Books and book chapters (peer reviewed marked \*)**

101. \*O. Kolosov and A. Briggs, **Ultrasonic Force and Related Microscopies**, chapter in book "Scanning Probe Acoustic Techniques", series of Nanoscience and Technology, Springer, (in press, 2012).

102. A. Briggs and O. Kolosov, **Acoustically Excited Probe Microscopy**, in “Advances in Acoustic Microscopy and High Resolution Ultrasonic Imaging: From Principles to New Applications” ed. Roman Maev, by Wiley VCH, (in press 2012).
103. A. Briggs and O. Kolosov, **Acoustic Microscopy**, second enlarged edition, Oxford University Press, (2010).
- c. Papers at conferences (only peer reviewed papers are included).**
104. Rosamond, M. C., Gallant, A. J., Atherton, J. J., Petty, M. C., Kolosov, O. and Zeze, D. A. **Transparent gold nanowire electrodes**, Proc. 11th IEEE International Conference on Nanotechnology, 15-18 Aug., Portland, USA, 604-607, (2011).
105. James W. Bennett, Robert Lattin, Leonid Matsiev, Mark Uhrich, Oleg Kolosov, **New Solid State Oil Condition Sensor for Real Time Engine Oil Condition Monitoring**, SAE International Technical papers, SAE Paper 2006-01-1324 (2006).
106. A. Buhrdorf, H. Dobrinski, O. Lüdtke, J. Bennett, L. Matsiev, M. Uhrich, O. Kolosov, **Multiparameteric Oil Condition Sensor Based on the Tuning Fork Technology for Automotive Applications**, Adv. Microsystems for Automotive Applications XVII, Jürgen Valldorf, ed, Springer, (2005). Matsiev, L, Bennett, J. Kolosov, O. **High precision tuning fork sensor for liquid property measurements**, Ultrasonics Symposium, 2005 IEEE, Sept. (2005), Volume: 3, 1492-5.
107. Huey, Bryan D.; Langford, Richard M.; Andrew, G.; Briggs, D.; Kolosov, Oleg V. **Characterization of the nanometer-scale mechanical compliance of semiconductors by ultrasonic force microscopy**. Institute of Physics Conference Series (2001), 169(Microscopy of Semiconducting Materials 2001), 531-534.
108. Shekhawat, G. S.; Kolosov, O. V.; Briggs, G. A. D.; Shaffer, E. O.; Martin, S.; Geer, R. E. **Nanoscale elastic imaging of aluminum/low-k dielectric interconnect structures**. Materials Research Society Symposium Proceedings (2001), 612(Materials, Technology and Reliability for Advanced Interconnects and Low-k Dielectrics), D1.7/1-D1.7/7.
109. Shekhawat, G. S.; Kolosov, O. V.; Briggs, G. A. D.; Shaffer, E. O.; Martin, S.; Geer, R. E., **Nanoscale elastic imaging of aluminum/low-k dielectric interconnect structures**, Mater. Res. Soc. Symp. Proc. (2001), 612(Materials, Technology and Reliability for Advanced Interconnects and Low-k Dielectrics).
110. Shekhawat, G. S.; Briggs, G. A. D.; Kolosov, O. V.; Geer, R. E., **Nanoscale elastic imaging and mechanical modulus measurements of aluminum/low-k dielectric interconnect structures**, AIP Conf. Proc. (2001), 550(Characterization and Metrology for ULSI Technology), 449-452.
111. Kumano, N.; Inagaki, K.; Kolosov, O. V.; Wright, O. B., **Optical heterodyne force microscopy**, Proc. - IEEE Ultrason. Symp. (1998), (Vol. 2), 1269-1272.
112. Inagaki, K.; Kolosov, O. V.; Briggs, G. A. D.; Muto, S.; Horisaki, Y.; Wright, O. B., **Ultrasonic force microscopy in waveguide mode up to 100 MHz**, Faculty of Engineering, Hokkaido University, Japan. Proc. - IEEE Ultrason. Symp. (1998), (Vol. 2), 1255-1259.
113. M.M. Puentes, J Bradshaw, M. Robertson, G.A.D. Briggs, N. Loxley and O. Kolosov, **Characterisation of near-surface mechanical properties and polishing damage by Surface Acoustic Waves**, Nondestructive Characterisation of Mater. VIII, R. E. Green, Plenum Press, 1998, **817-823**.
114. O. Kolosov, A. Briggs, K. Yamanaka, W. Arnold, **Nanoscale Imaging Of Mechanical-Properties By Ultrasonic Force Microscopy (UFM)**, Acoustical Imaging, 1996, **Vol.22**, p.665-668, Ed: P. Tortoli, L. Masotti, Plenum Press, New York..
115. A. Briggs, O. Kolosov, M. Heras, **Materials Characterisation By Surface Acoustic-Waves From 200-MHz To 20-GHz**, Acoustical Imaging, 1996, **Vol.22**, p.657-664, Ed: P. Tortoli, L. Masotti, Plenum Press, New York.
116. Gruverman, A.; Kolosov, O.; Hatano, J.; Takahashi, K.; Tokumoto, H., **Nanoscale control of ferroelectric domain structure by AFM**, Mater. Res. Soc. Symp. Proc. (1995), **357** (Structure and Properties of Interfaces in Ceramics), 363-8.
117. H. Ogiso, S. Nakano, O. Kolosov, K. Yamanaka, T. Koda, **Study on the Modification of HOPG Atomic Structure MeV by Ion Implantation**, Proceedings of the Ninth Symposium on Surface Layer Modification by Ion Implantation SMI<sup>2</sup>, ISSN 0917-1460, Nov. 22, 1993, Tokyo, Japan, pp.57-58.
118. Kolosov O. V., Ogiso H., Yamanaka K., **Ultrasonic Force Microscopy - a New Technique for a Nondestructive Investigation on Nanometer Scale Viscoelastic Properties**, Proceedings of the 3rd Japan International SAMPE Symposium (Nondestructive Evaluation), Tokyo, Japan, Dec. 9-10 (1993) pp.2196-2201.
119. Sato H., Kolosov O. V., Nagata Y., Koda T., and Yamanaka K., **Acoustic imaging of plate thickness and sound velocity of a plate during tensile testing in low temperature**, Ultrasonic Electronics Symposium Proceedings, USE 93, Tokyo, JAPAN, Dec. 7-9 (1993), pp.59-60.
120. K. Yamanaka, H. Ogiso, and O. Kolosov, **Subsurface imaging by atomic force microscope with ultrasonic vibration of samples (in japanese)**, Ultrasonic Electronics Symposium Proceedings, USE 93, Tokyo, JAPAN, Dec. 7-9 (1993), pp.27-28.
121. Sato H., Kolosov O. V., Nagata Y., Koda T., and Yamanaka K., **Simultaneous measurement of thickness and sound velocity of a plate during tensile testing in low temperature acoustic microscopy**, Proceedings of 3rd Japan International SAMPE Symposium (Nondestructive Evaluation), Tokyo, Japan, Dec. 9-10, (1993), pp.2202-2206.
122. O.V. Kolosov, K. Yamanaka, O. I. Lobkis and P. V. Zinin, **Evaluation of a Point-spread-function of Focusing Systems Using Spherical Reflector**, Proc. of Ultrasonics International'93, Vienna, Austria, 1993 pp.547-550.

123. A. Gruverman, O. Kolosov, J. Hatano, K. Takahashi, and H. Tokumoto, **Nanoscale control of ferroelectric domain structure by AFM**, in MRSoc. Symp.Proc. **357** (1995) pp.363-368.
124. Yamanaka K., Kolosov O.V., Ogiso H., Sato H., Koda T., **Atomic Force Microscope Using Lateral Vibration of Sample (in Japanese)**, Proc. of Acoustic Soc. of Japan 93'Symp., Tokyo, Japan, March 01 (1993) pp.889-890.
125. Kolosov O. and Yamanaka K., **Adjustable Acoustic Knife Edge for Anisotropic and Dark Field Acoustic Imaging (invited)**, Proc. of 6th Symposium of Ultrasonic Micro Spectroscopy, UMS'6, Hitachi Machinery Co., Tsuchiura, March 23, 1993, Japan, 23.03.93, pp. 39-40.
126. Suzuki M., Kolosov O., Yamanaka K., **Study of mechanical and ultrasonic properties of polymer gel structure formed by freezing method**, Proc. of Symp. on Achievements in Polymer Research, JITA (Japan Industrial Techn.Ass.), Feb. 2, 1993, Tokyo, Japan (in Japanese), No. 226, 5.02.93, pp. 47-52.
127. Kolosov O. V., Suzuki M., Yamanaka K., **Investigation of Mechanical Microstructure of the Polymer Gel for the Artificial Muscles Using Acoustic Microscopy**, Proc. of 6th Conf. of Polymer Gel (Polym. Soc. Japan), Tokyo, Japan, Jan. 1993, 345-346.
128. Kolosov O. V. and Yamanaka K., **Adjustable Acoustic Knife Edge for Anisotropic and Dark Field Imaging**, Proc. Symp. on Ultrasonic Electronics '92, Sendai, Japan, 1992, pp.141-142.
129. Yamanaka K., Nakano Sh., Ogiso H., Kolosov O. V., Koda T., **Characterization of Micro-mechanical Component Using Acoustic Microscopy and New Design Concepts Based on Controlled Elasticity Distribution**, 3d Int. Symp. on Micro Machine and Human Sci., Nagoya, Japan, 1992, pp.59-67.
130. Maev R. G., Kolosov O. V., Levin V. M., Lobkis O. I., **Transmission Acoustic Microscopy Investigation**, in book: Acoustical Imaging, edited by H. Ermert and H.-P. Harjes, Plenum Press, N.Y., v.19, 1992, pp.679-683.
131. Ataev K. O., Kolosov O. V., Levin V. M., Mayev R. G., **The Investigations of the Local Piezoelectric Properties by Acoustic Microscopy**, Proc. of IEEE Symp. on Ferroel. and Freq. Control, 1988, Chicago, USA, v.2, 1988, pp.775-777.
132. Kolosov O. V., Matsiev L. F., **Measuring of Microstructure Parameters of Composite Polymer Materials Using Transmission Acoustic Microscope**, (in Russian), Dep. Nation. Inst. of Sci. and Techn. Inf. USSR, (VINITI), Moscow, USSR, v.B-88, No.5955, 1988, pp.1-9.
133. Kolosov O. V., Levin V. M., Mayev R. G., Senjushkina T. A., **Investigation of Viscoelastic Properties of Biopolymers Using Transmission Acoustic Microscope**, Proc. of V-th Int. Symp. on New Methods in Biol. and Med., Moscow, USSR, 1987, pp.141-146.
134. Senyushkina T. A., Kolosov O. V., Levin V. M., Mayev R. G., Pirusian L. A., **Acoustic Microscopy of Biological Tissues**, Proc. Int. Symp. on Microscope Photometry and Acoustic Microscopy in Science, Moscow, USSR, 1985, pp.137-146.
135. Kolosov O. V., Levin V. M., Mayev R. G., **The "Edge" Effect During Acoustic Imaging by Transmission Type Acoustic Microscope**, Proc. Int. Symp. on Microscope Photometry and Acoustic Microscopy in Science, Moscow, USSR, 1985, pp.66-72.
136. Kolosov O. V., **Transmission Raster Acoustic Microscope with Quantitative Characterization Facilities**, Proc. Int. Symp. on Microscope Photometry and Acoustic Microscopy in Science, Moscow, USSR, 1985, pp.26-31.
137. Enicolopyan N. S., Kolosov O. V., Lagutenkova E. Yu., Mayev R. G., Novikov D. D., **The Quantitative Transmission Raster Acoustic Microscopy of Polymer Composition**, Proc. Int. Symp. on Microscope Photometry and Acoustic Microscopy in Science, Moscow, USSR, 1985, pp.106-110.
138. Andreeva L. A., Gerchicov A. N., Kolosov O. V., Mayev R. G., Senjushkina T. A., Fridman F. E., **The Study of Sclera Anisotropy by Acoustic Microscopy**, Proc. Int. Symp. on Microscope Photometry And Acoustic Microscopy in Science, Moscow, USSR, 1985, pp.149-152.
139. Kolosov O. V., Levin V. M., Mayev R. G., Marakuyeva I. V., **Tissue Characterization by Acoustic Microscopy**, Proc. of "ULTRASOUND'82", Oxford, England, Pergamon Press, 1982, pp.164-165.

**d. Published patent applications.**

140. O. Kolosov and I. Grishin, **Method and apparatus for ion beam polishing**, priority 2010-FEB-17, UK patent application 10002645.8, World patent application PCT/G82011/000169 (2011).
141. Kolosov O., Matsiev L., Varni J., Dales C., Luedtke O., Wullner D., Buhrdorf A., Dobrinski H., **Resonator sensor assembly**, US patent application 2010218353 (2010).
142. Matsiev L., Kolosov O., Uhrich M., Rust W., Feland J., Varni J., Walker B., **Environmental control system fluid sensing system and method**, US Patent application 2009064693 (2009).
143. Cypes Stephen, Uhrich Mark Carlson Eric D; Kolosov Oleg; Padowitz David; Bennett James; Matsiev Leonid, **Monitoring By Means Of An On-Line Sensor And Fluidic Operations Involving Unit Separation And Reaction Operations**, European Patent Application, EP1877768, January 16 (2008).
144. Matsiev Leonid, Bennett; James, Pinkas; Daniel M., Spitkovsky; Mikhail, Kolosov; Oleg, Guan; Shenheng, Uhrich; Mark, Dales; G. Cameron, Varni; John F., Walker; Blake, Gammer; Vladimir, Padowitz; Dave, Low; Eric, **Machine fluid sensor**, United States Patent Application (continuation) US2007272209, 19 November (2007).

145. Carlson Eric D., Kolosov; Oleg, Matsiev; Leonid, **High throughput microbalance and methods of using same**, US Patent application, US2007251323, 1 November (2007).
146. Matsiev Leonid, Bennett; James, Pinkas; Daniel M., Spitzkovsky; Mikhail, Kolosov; Oleg, Guan; Shenheng, Uhrich; Mark, Dales; G. Cameron, Varni; John F., Walker; Blake, Gammer; Vladimir, Padowitz; Dave, Low; Eric, **Machine fluid sensor**, United States Patent 7,254,990 August 14 (2007).
147. Burdett Ian; Lynn Timothy; Kolosov Oleg; Zilker Daniel Paul Jr; Matsiev Leonid **Systems And Methods For Monitoring Solids Using Mechanical Resonator**. World Patent Application, WO2007005528, Jan 11 (2007).
148. Carlson Eric D., Kolosov; Oleg, Matsiev; Leonid, **High throughput microbalance and methods of using same**, USA Patent 7,207,211, April 24 (2007).
149. Kolosov; Oleg; Matsiev; Leonid; Varni; John F.; Dales; G. Cameron; Ludtke; Olaf;; Wullner; Dirk;; Buhrdorf; Andreas;; Dobrinski; Heiko,, **Resonator sensor assembly**, USA Patent Appl. 20070052970, March 8, (2007).
150. Cypes; Stephen; Uhrich; Mark; Carlson; Eric D.; Kolosov; Oleg; Padowitz; David; Bennett; James; Matsiev; Leonid, **Monitoring And Controlling Unit Operations**, USA Pat. Appl. 20070017291, January 25 (2007).
151. Burdett; Ian; Lynn; Timothy; Kolosov; Oleg;; Zilker; Daniel Paul JR.;; Matsiev; Leonid; **Systems and methods for monitoring solids using mechanical resonator**, USA Pat. Appl. 20070003450, January 4 (2007).
152. Matsiev; Leonid; Bennett; James; Pinkas; Daniel M.; Spitzkovsky; Mikhail; Kolosov; Oleg; Guan; Shenheng; Uhrich; Mark; Dales; G. Cameron; Varni; John F.; Walker; Blake; Gammer; Vladimir; Padowitz; Dave; Low; Eric; **Machine fluid sensor**, USA Pat. Appl. 20060218996, October 5 (2006).
153. Cypes; Stephen; Uhrich; Mark; Carlson; Eric D.; Kolosov; Oleg; Padowitz; David; Bennett; James; Matsiev; Leonid, **Monitoring And Operations Involving Unit Separation And Reaction Operations**, World Patent Application, WO2006107900, Dec 10, (2006).
154. Kolosov Oleg (US); Spitzkovsky Mikhail (US); Bennett James (US); Matseiv Leonid (US); Gammer Vladimir (US), Multi-Position Fluid Sensors And Methods, World Patent Application, WO2006084263, Oct 08 (2006).
155. James Bennett, G. Cameron Dales, John M. Feland III, Oleg Kolosov, Eric Low, Leonid Matsiev, William C. Rust, Mikhail Spitzkovsky, Mark Uhrich **Portable Fluid Sensing Device and Method** 2006-0031030 02/09 (2006)
156. James Bennett, Oleg Kolosov, Leonid Matsiev **Flexural Resonator Sensing Device And Method** US 2005-0262944 12/01 (2005)
157. Oleg Kolosov, Leonid Matsiev, Mikhail Spitzkovsky, Vladimir Gammer **Integrated Circuitry For Controlling Analysis Of A Fluid** US 2005-0209796 09/22 (2005)
158. Charmot, Dominique; Gibbs, Christopher David; Kolosov, Oleg; Liu, Mingjun; Nguyen, Son Hoai; Petro, Miroslav; Rannard, Steven Paul. **Oral dentifrice compositions comprising cationic polymers**. U.S. Pat. Appl. Publ. 6 pp. US 2005063918. (2005)
159. Chang, Han Ting; Charmot, Dominique; Duncalf, David; Kolosov, Oleg; Nava-Salgado, Victor; Nguyen, Son Hoai; Petro, Miroslav; Rannard, Steven Paul. **Oral dentifrice compositions containing cationic polymers**. U.S. Pat. Appl. Publ. 4 pp. CODEN: USXXCO US 2005063920. (2005)
160. James Bennett, Oleg Kolosov, Leonid Matsiev **Flexural Resonator Sensing Device And Method** WO2005/103645 11/03 (2005)
161. James Bennett, G. Cameron Dales, John M. Feland III, Oleg Kolosov, Eric Low, Leonid Matsiev, William C. Rust, Mikhail Spitzkovsky, Mark Uhrich **Portable Fluid Sensing Device and Method** WO2005/103674 11/02 (2005)
162. Eric D. Carlson, Oleg Kolosov, Leonid Matsiev, Laura T. Mazzola, Mikhail Spitzkovsky, John Gallipeo **High Throughput Microbalance And Methods of Using Same** US 2005-0166679 08/04 (2005)
163. Leonid Matsiev, Oleg Kolosov, Mark Uhrich, William C. Rust, John M. Feland III, John F. Varni, Blake Walker **Environmental Control System Fluid Sensing System and Method** US 2005-0145019 07/07 (2005)
164. Oleg Kolosov, Leonid Matsiev, Mikhail Spitzkovsky, Vladimir Gammer **Application Specific Integrated Circuitry For Controlling Analysis For a Fluid** US 2005-0149276 07/07 (2005)
165. Charmot, Dominique; Gibbs, Christopher David; Kolosov, Oleg; Liu, Mingjun; Nguyen, Son Hoai; Petro, Miroslav; Rannard, Steven Paul. **Oral care compositions comprising a polymer obtained from cationic monomers and anionic or neutral monomers**. U.S. Pat. Appl. Publ 6 pp. US 2005063921. (2005).
166. Chang, Han Ting; Charmot, Dominique; Duncalf, David; Kolosov, Oleg; Nava-Salgado, Victor; Nguyen, Son Hoai; Petro, Miroslav; Rannard, Steven Paul. **Oral dentifrice composition containing cationic polymers**. U.S. Pat. Appl. Publ. 4 pp. CODEN: USXXCO US 2005063919 (2005)
167. Damian Hajduk, Eric D. Carlson, J. Christopher Freitag, Oleg Kolosov, James R. Engstrom, Adam Safir, Ravi Srinivasan, Leonid Matsiev **Instrument For High Throughput Measurement Of Material Physical Properties And Method Of Using Same**, US Patent 6,936,471, 30 Aug, (2005).
168. Hajduk, Damian A.; Kolosov, Oleg. **High throughput permeability testing of materials libraries**. U.S. Pat. Appl. Publ. 19 pp. US 2004077091. (2004)
169. Oleg Kolosov, Leonid Matsiev, John F. Varni, G. Cameron Dales **Resonator Sensor Assembly** US 2004-0250622 A1 12/16 (2004)
170. Oleg Kolosov, Leonid Matsiev, John F. Varni, G. Cameron Dales, Olaf Ludtke (Hella), Dirk Wullner (Hella), Andreas Buhrdorf (Hella), Heiko Dobrinski (Hella) **Resonator Sensor Assembly** WO 2004/086003 A1 10/07 (2004)

171. Kolosov, Oleg; Matsiev, Leonid. **High throughput rheological testing of materials.** U.S. Pat. Appl. Publ. 23 pp., which. US 2004123650. (2004)
172. Oleg Kolosov, Leonid Matsiev, David Padowitz **Mechanical Resonator** US 2004-0244487 A1 12/09 (2004)
173. Oleg Kolosov, Leonid Matsiev, Mikhail Spitkovsky, Vladimir Gammer **Application Specific Integrated Circuitry For Controlling Analysis For a Fluid** WO 2004/086020 A2 10/07 (2004)
174. Oleg Kolosov, Leonid Matsiev, John F. Varni, G. Cameron Dales **Resonator Sensor Assembly** WO 2004/086002 A1 10/07 (2004)
175. Padowitz, David; Matsiev, Leonid; Kolosov, Oleg. **Mechanical resonator.** WO 2004086027. PCT Int. Appl. (2004)
176. Kolosov, Oleg V.; Gammer, Vladimir; Matsiev, Leonid; Spitovsky, Mikhailb. **Application specific integrated circuitry for controlling analysis of a fluid.** WO 2004086020. PCT Int. Appl. (2004)
177. Kuebler, Sigrid; Carlson, Eric; Crevier, Thomas; Kolosov, Oleg; Low, Eric. **Image analysis of heterogeneous mixtures.** 54 pp. WO 2004053468. PCT Int. Appl. (2004)
178. Hajduk, D. A.; Carlson, E. D.; Freitag, J. C.; Kolosov, O.; Engstrom, James R.; Safir, A.; Srinivasan, R.; Matsiev, L., Matsiev, Leonid; Varni, John F.; Kolosov, Oleg; Uhrich, Mark D.; Feland, John. **Environmental control system fluid sensing system and method.** 61 pp. WO 2004036207. PCT Int. Appl. (2004)
179. Matsiev, Leonid; Bennett, James; Pinkas, Daniel M.; Spitkovsky, Mikhail; Kolosov, Oleg; Guan, Shenheng. **Machine fluid sensor and method.** WO 2004036191. PCT Int. Appl. (2004)
180. Carlson, Eric D.; Kolosov, Oleg. **High throughput testing of fluid samples using an electric field.** 20 pp. US 2003203500. U.S. Pat. Appl. Publ. (2003)
181. McWaid, Thomas Harding; Kolosov, Oleg; Klaerner, Gerrit; Petro, Miroslav; Nguyen, Son Hoai; Kuebler, Sigrid. **Method and apparatus for screening flowable separation media for electrophoresis and related applications** 22 pp. US 2003196896. . U.S. Pat. Appl. Publ. (2003)
182. Hajduk, D. A.; Kolosov, O. **High throughput preparation and analysis of plastically shaped material samples,** U.S. Pat. Appl. Publ. (2003), US 20030141613 A1, Publication date July 31. (2003)
183. Kolosov, Oleg; Matsiev, Leonid; Petro, Miroslav. **Flow detectors having mechanical oscillators, and use thereof in flow characterization systems.** PCT Int. Appl. WO 0299414 A1 20021212 (2002)
184. O. Kolosov and A. Briggs, **Atomic Force Microscopy Apparatus and Method thereof,** UK patent application, no. 9617380.2, filing (priority) date 19 August 1996.
185. Kolosov O. V., Yamanaka K., Watanabe K., **Ultrasonic oscillation detection method and sample observing method in atomic force microscope,** No. K-2712, **priority 12.05.93,** F1909, (5-133878), Patent of Japan, publication No.06323843 A.

## §6. IP AND IMPACT GENERATION

### a. List of major IP items including impact generated.

	IP area	Patent - applications/ awarded patents	Industries involved (in the field)	Impact description	External references
1	Fluid sensors	US 7,043,969 US 7,210,332	Measurement specialties (Honeywell)	Monitoring urea concentration in diesel engine NOx scrubber	<a href="http://www.meas-spec.com/fluid-property-sensors.aspx">http://www.meas-spec.com/fluid-property-sensors.aspx</a> <a href="http://www.meas-spec.com/downloads/FPS2851ULC4.pdf">http://www.meas-spec.com/downloads/FPS2851ULC4.pdf</a>
2	Gas and liquid viscosity and density sensors	US 7,043,969 US 7,721,590	Baker Hughes	More efficient oil and gas exploration	<a href="http://www.jptonline.org/index.php?id=1226">http://www.jptonline.org/index.php?id=1226</a> <a href="http://www.bakerhughes.com/news-and-media/resources/brochures/in-situ-fluids-explorer-afx">http://www.bakerhughes.com/news-and-media/resources/brochures/in-situ-fluids-explorer-afx</a>
3	Motor oil condition monitoring	US 7,043,969 US 7,210,332 US 7,721,590	Hella KG, Measurement Specialties (also FIAT, BOSCH)	Improving timing for motor oil change by in-situ measurements of micromechanical and electrical parameters of motor oil	<a href="http://www.businesswire.com/news/home/20081008005793/en/Hella-Sensors-Continuously-Monitor-Engine-Oil-Level">http://www.businesswire.com/news/home/20081008005793/en/Hella-Sensors-Continuously-Monitor-Engine-Oil-Level</a>  <a href="http://ip.com/patent/US7721590">http://ip.com/patent/US7721590</a>
4	IC interfaces for physical properties measurement	US 7,225,081	Analog Devices	Widely used on-chip vector network analyser for precision measurements of physical properties	<a href="http://www.analog.com/en/rfif-components/direct-digital-synthesis-dds/ad5933/products/product.html">http://www.analog.com/en/rfif-components/direct-digital-synthesis-dds/ad5933/products/product.html</a>
5	Characterization of nanostructures	WO/2011/101613	LEICA Microsystems (also JEOL, Hitachi, Gatan)	New instrumentation for sample preparation for nanoscale resolution subsurface studies	<a href="http://www.highbeam.com/doc/1P3-2435666231.html">http://www.highbeam.com/doc/1P3-2435666231.html</a> Collaboration agreement between Lancaster University and Leica Microsystems (2011)

## **§7. MOST SIGNIFICANT PUBLICATIONS**

1. \*(submitted) Manuel E. Pumarol, Peter Tovee, Mark C. Rosamond, Michael C. Petty, Dagou A. Zeze, Vladimir Falko, and Oleg V. Kolosov, **Direct nanoscale imaging of ballistic and diffusive thermal transport in graphene** (submitted to Nature Materials), (2011).
2. \*Kolosov O. V. and Yamanaka K., **Nonlinear Detection of Ultrasonic Vibrations in an Atomic Force Microscope**, Japanese J. Appl. Phys. Lett., **32** Part.2 (Letters), No.8A, pp.L1095-L1098, (1993).
3. \*Cuberes, M. T.; Assender, H. E.; Briggs, G. A. D.; Kolosov, O. V. **Heterodyne force microscopy of PMMA/rubber nanocomposites: nanomapping of viscoelastic response at ultrasonic frequencies.** J.Phys. D: Appl. Phys 33(19), 2347-2355 (2000).
4. \*O. Kolosov, A. Gruverman, J. Hatano, K. Takahashi, and H. Tokumoto, **Visualization and Control of Ferroelectric Domains at Nanoscale by Atomic Force Microscopy**, Physical Review Letters, **74** 4309-4312, (1995).
5. \*K. Yamanaka, H. Ogiso, and O. Kolosov, **Ultrasonic Force Microscopy for nanometer resolution subsurface imaging**, Appl. Phys. Lett. **64** No.2 pp.178-180, (1994).

(In all these papers I generated the initial idea, tested it experimentally, was leading (refs. 2-4) or participated in (refs. 1,5) theoretical development, guided the experiment, and prepared the summary of the results).

## **§8. ADMINISTRATION AND MANAGEMENT**

### **Departmental duties.**

**2008 – present**

Director of Postgraduate admissions and Director of Postgraduate Studies.

**2007 – 2008**

Deputy Director of Postgraduate admissions and Postgraduate Studies.

### **Major activities.**

- Facilitating enrolment, increasing number and quality of applicants (working closely with FST and University admissions, PG students registry and International Office ).
- Targeting admission and marketing to increase number of funded OS students.
- Participating in setting new international collaborations (e.g. Al-Najah University (Palestine); COMSATS (Pakistan)).
- Producing working papers on entry requirements initiative, degree schemes, joint degrees with Universities outside UK.
- Contributing to improvement of University-wide online admissions and appraisal systems.