Curriculum Vitae

Oleg V. Kolosov

Affiliation Department of Physics,
Lancaster University,
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Date of birth: 19th December 1959, Kiev, Ukraine
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i. GENERAL INFORMATION.

i.1) Primary affiliations

2006 - present Reader in Condensed Matter Physics, Director of Postgraduate studies, Head (interim) of Experimental Condensed Matter Division, Physics Department, Lancaster University, UK
2000 – '06 Director, Innovation and Sensor Technology, Symyx Technologies Inc., CA, USA (2003-'06), in 2000-'02 Director, Polymer Properties Screening, on research leave from University of Oxford, UK)
1996-2002 EPSRC Advanced Fellow, Senior Research Fellow at Materials Department, University of Oxford, UK
1994 – 1996 Research Fellow, Materials Department, University of Oxford, UK
1992 – '94 Research Fellow, National Institute for Advanced Interdisciplinary Research, Mech. Eng. Lab., Tsukuba, Japan
1986 – '92 Staff Scientist, Institute of Chemical Physics, Russian Academy of Sciences, Moscow, Russia
1984 – '88 Post-Graduate Scholar, Moscow Institute of Physics and Technology, Moscow, Russia

i.2) Personal appointments, fellowships, awards and memberships of advisory bodies.

2013 - present Member of Royal Society International Exchanges Panel, Member of EPSRC Peer Review College
2009-'13 External Examiner, Postgraduate Certificate in Nanotechnology, Oxford University, UK
2008-2013 Grant reviewer for Israel Science Foundation, EU and USA DOE, Research Grants Council, Hong Kong.
from 2006 Member of Scientific Advisory Boards: Ampirica LLC, Anasys Instruments and Symyx Technologies, USA.
1999 Winner, Metrology for World Class Manufacturing Award, Frontier Science and Measurement, UK.
1996 - 2002 Research Fellow (1994-'96 Visiting Scholar) of Wolfson College, Oxford University, UK
1996-1999 Member of Structural Materials College, EPSRC, UK
1995 & **1997** Paul Instrument Fund Awards (c/o the Royal Society), UK
1998 Senior Fellow of JSPS (Japanese Society of Promotion of Science), Japan
1996 Invited Professor (Professeure Invité), University of Montpellier II, France.
1995 - 1999 Consultant, Bede Scientific Instruments Ltd, Durham, UK.
1992 – 1994 Fellow of Science and Technology Agency of Japan

i.3) Academic and professional qualifications

2008 Certificate in Academic Practice 1, Lancaster University, UK.
1989 Ph.D. in Physics and Mathematics, Moscow Institute of Physics and Technology (Moscow PhysTech).
1982 Diploma (M.Sc. honours, summa cum laude,) in Biophysics, Moscow Institute of Physics and Technology.

ii) RESEARCH

ii.1) Research profile and programme

Research in my group builds on extensive expertise in nanotechnology, acoustic and scanning probe microscopies, and advanced materials, expanding from the areas that I pioneered and that are now explored by various research groups worldwide, including

- **Ultrasonic Force and Heterodyne Force Microscopies (UFM and HFM)** – merging scanning probe microscopy (SPM) with ultrasonics and acoustical imaging to enable dynamic nanomechanical mapping of materials [58, 79, 83];
- **imaging of nanoscale subsurface and interfacial structure of materials** in SPM with ultrasonic vibrations [63,93];
- **nano-manipulation of ferroelectric domains in SPM -** writing/erasing domains with nm precision [69, 70];

to current topics that can be summarised as exploration of nanoscale physical properties - mechanical, spectroscopic, thermal - of advanced materials - a major challenge if nanoscale resolution and probing of interfaces or under sample surface is required:

- mapping of **ballistic nanoscale thermal transport in graphene** via scanning thermal microscopy (SThM) [114, 135];
- exploring **hidden subsurface charges** at the interfaces under layers of two-dimensional (2D) materials [138];
- investigating nanoscale thermal, and dynamic nanomechanical properties of **liquids-2D materials interface** [121,137];
- exploring, via UFM and HFM nanomechanical mapping, **early stages of amyloid peptides aggregation** [118,136];
- imaging **3D nanostructure of semiconductors and functional materials** in SPM with TEM-like performance [110,115].

Leveraging these developments, the future research directions in my group can be clustered into three interlinked areas:

- addressing a major challenge of **quantitative measurements of surface and subsurface nanoscale physical properties** (mechanical, piezo/electromechanical, nanothermal) of 2D materials, quantum structures and semiconductor devices;
- exploring such physical properties **on nm length and sub-ns time scales** (via HFM-like [93] approach), expanding it to studies of quantum nanoelectromechanical systems **(QEMS)** and post-Moore's law **piezo-transistors**;
- adding a **spectroscopic capability** (via thermomechanics [102]) to SPM for biopolymer and biosensor applications.

We expect that these developments will create new research fields, adding areas where Lancaster is a world leading institution, enabling a steady research funding stream, attracting high industrial interest and ensuring applications breakthroughs.

ii.2) Details of external funding (from 2009)

Year	Role	Research project	Granting body (code)	LU income
2013–'17	PI	*QUANTIHEAT* – Nanothermal metrology of materials	EC (FP7) (PYA7032)	£484,000
2013–'16	PI	*SCANCAN* - Spectrochemical imaging of tissues (Critical Mass)	EPSRC EP/K023373/1 (PYA7016)	£289,000
2011–'13	PI	*GRENADA* - Graphene for nano-scaled applications	EC (FP7) (PYA7941)	£294,000
2011-'15	PI	*FUNPROB* - Functional Semiconductor Nanowire Probe	EC (FP7) (PYA7964)	£38,000
2011-'15	Co-I	Quasiparticle Imaging and Superfluid Flow at ULT	EPSRC (EP/I028285/1)	£886,000
2009-'13	PI	*Materials World Network*- Phase Change Materials	EPSRC/NSF (EP/G06556X/1)	£198,000
2009-'12	PI	Nanoscale Resolution using CNT Scanning Thermal Probe	EPSRC (EP/G015570/1)	£356,000
2009-'12	Co-I	Coupling of quantum dots to two-dimensional systems	EPSRC (EP/H006419/1)	£294,000

ii.3) Conferences and symposia organised, chaired/co-chaired; editorial activities (from 2009).

2014 EUROTHERM 103, Member of Scientific Committee, Lyon, France 2014
2013 JSAP-MRS conference, Kyoto, JAPAN (2013).
2013 International workshop QMNTIA 2013 (Quant. Micro and Nano-Thermal Imaging and Analysis), Reims, France.
from 2012 Editor of "Crystals".
2011 Editor of MRS Proceedings, vol. 318 (Advances of Spectroscopy and Imaging of Surfaces and Nanostructures).
2010 - Advanced Microscopy Symposium, MRS Fall Meeting, Boston, USA.
2009 Symposium on Nanomechanics, ECOSS 26, European conference on surface science, Parma, Italy
2006 – 2012 Editor "Journal of Nanobiotechnology".

ii.4) Invited talks (from 2009).

2015 (planned March 2015) SPM Central EU Workshop, Lednice, Czech Republic.
2014 Materials Research Society Fall Meeting, Boston, MA, USA.
2014 Kamerling Onnes Laboratory, Leiden, Netherlands, 2013.
2014 Institute of Material Science Colloquia, University of Connecticut, Storrs, CT, USA.
2013 International Center for Materials Nanoarchitectonics, National Institute for Materials Science, Tsukuba, Japan.
2013 Centre for Nanotechnology Innovation, NEST, Scuola Normale, Pisa, Italy.
2013 QMNTIA 2013 (Quantitative Micro and Nano-Thermal Imaging and Analysis), Reims, France.
2013 Clarendon Laboratory Colloquia, Physics Department, Oxford University, Oxford, UK.
2013 NPL (National Physical Laboratory) Colloquia, Teddington, UK.
2013 Materials Department Colloquia, University of Oxford, UK.
2013 Bruker nanotechnology users seminar, Warwick, UK
2013 International Symposium on Molecular Electronics, Lancaster, UK
2012 4th Multifrequency AFM Conference, Madrid, Apain.
2012 BIT's Annual World Congress of Advanced Materials, Bejing, China.
2012 The International Conference on Graphene and its Applications, Loughborough, UK.
2012 Experimenter of the Week Lecture, Kavli Institute of Theoretical Physics, Santa Barbara, USA.
2012 Physics Department Colloquia, Loughborough University, Loughborough, UK.
2011 Villa Conference on Interaction Among Nanostructures, Las Vegas, USA.
2011 Physics Department Colloquia, Leeds University, Leeds, UK.
2010 UK SPM, Microscience, London, UK.
2010 Royal Microscopical Society (Cryomicroscopy Group Meeting), Birmingham, UK.
2010 Inst. of Physics, Lancashire-Cumbria Branch, UCLAN, Preston, UK.

ii.5) Professional memberships

since 2010 Member of the Institute of Physics;
1994–'07 Member of American Physical Society;
2001-'07 Member of American Chemical Society; Member of Materials Research Society
1995-'97 Member of the Network of European Scientists and Technologists (NEST) in Japan

ii.6) Industrial impact generated by research activities

	Impact area, description of the IP	IP – patents & applications (year)	Industrial sector & companies currently using the IP	External web references
	Instrumentation for semiconductor industry: imaging of subsurface and 3D structure of nanoscale devices	*WO/2011/101613* (2011)	Semiconductor and Scientific instrumentation companies: LMA Ltd. (LU spin-off, 2014)	http://www.highbeam.com/doc/1P3-2435666231.html
	Oil and gas exploration: probing oil and gas physical properties via micro-machined sensors.	*US 7,721,590* (2010) *US 7,562,557 (2009)* *US 7,043,969* (2006)	Oil and gas exploration companies. Baker Hughes Inc.	http://www.bakerhughes.com/news-and-media/resources/brochures/in-situ-fluids-explorer-ifx
	Automotive MEMS sensors: motor oil/fluids condition monitoring.	*US 8,732,938* (2014) *US 7,210,332* (2007)	1st/2nd tier Automotive industries suppliers: TE Connectivity Inc.	http://www.meas-spec.com/fluid-property-sensors/fluid-property-sensors.aspx
4	MEMS/NEMS sensors, analogue/ digital IC's: sensor interface, on-chip lock-in amplifier, vector analyser.	US 7,225,081 (2007) US 7,158,897 (2007)	Semiconductor industry, IC manufacturers: Analog Devices, Inc.	http://www.analog.com/en/rfif-components/direct-digital-synthesis-dds/ad5933/products/product.html

ii.7) Research and Scholarly work

ISI metric (articles & proceedings only)	Total found	Google Scholar metric (including books and patents)	Total found	Since 2009
Publications	95		201	62
Citations	1502	Citations	3107	1268
h-index	19	h-index	23	17
Citations per item	15.81	i10-index	47	33

Full list can be found at http://www.research.lancs.ac.uk/portal/en/people/oleg-kolosov/publications.html.

Journal papers (peer reviewed)

138*. Kay, N, Robinson, B, Falko, V, Novoselov, K & Kolosov, O, 'Electromechanical sensing of substrate charge hidden under atomic 2D crystals' *Nano Letters*, vol 14, no. 6, pp. 3400-3404., (2014)

137*. Robinson, B & Kolosov, O Probing nanoscale graphene-liquid interfacial interactions via Ultrasonic Force Spectroscopy, *Nanoscale*, vol 6, no. 18, pp. 1080616, 2014)

136*. Tinker-Mill, C, Mayes, J, Allsop, D & Kolosov, O, 'Ultrasonic force microscopy for nanomechanical characterization of early and late-stage amyloid-β peptide aggregation' *Nature Publishing Group, Scientific Reports*, vol 4, 4004 (2014)

135*. D. Tovee, P, Pumarol, M, C. Rosamond, M, Jones, R, C. Petty, M, A. Zeze, D & V. Kolosov, O, 'Nanoscale resolution scanning thermal microscopy using carbon nanotube tipped thermal *probes' Phys. Chem. Chem. Phys.*, Vol. 16, No. 3, p. 1174-1181, (2014).

134*. J. Bosse, I. Grishin, Y.G. Choi, B.-k. Cheong, S. Lee, O. Kolosov, B.D. Huey, 'Nanosecond Switching in GeSe Phase Change Memory Films by AFM', *Appl. Phys. Lett., vol 104, no. 5, 053109.* (2014).

133*. Ahlstrom, S. L.; Bradley, D. I.; Človečko, M.; Fisher, S. N.; Guénault, A. M.; Guise, E. A.; Haley, R. P.; Kolosov, O.; McClintock, P. V. E.; Pickett, G. R.; Poole, M.; Tsepelin, V.; Woods, A. J., Frequency-dependent drag from quantum turbulence produced by quartz tuning forks in superfluid 4He. *Phys. Rev. B*, 89 (1), 014515. (2014)

132*. Bosse, J. L.; Timofeeva, M.; Tovee, P. D.; Robinson, B. J.; Huey, B. D.; Kolosov, O. V.,. Nanothermal characterization of amorphous and crystalline phases in chalcogenide thin films with SThM, *J Appl Phys* 116, 134904 (2014).

131*. Zhuang, Q, Anyebe, E, Sanchez, AM, Rajpalke, MK, Veal, TD, Zhukov, A, Robinson, B, Anderson, F, Kolosov, O & Falko, V 2014, 'Graphitic platform for self-catalysed InAs nanowires growth by molecular beam epitaxy'. *Nanoscale Research Letters*, vol 9, 321., (2014)

130*. Anyebe, E, Zhuang, Q, Sanchez, AM, Lawson, S, Robson, A, Ponomarenko, LA, Zhukov, A & Kolosov, O Self-catalysed growth of InAs nanowires on bare Si substrates by droplet epitaxy', *Physica Status Solidi : Rapid Research Letters*, vol 8, no. 7, pp. 658–662., (2014)

129*. Bosse, J, Grishin, I, Huey, B & Kolosov, O Nanomechanical morphology of amorphous, transition, and crystalline domains in phase change memory thin films *Appl. Surf. Sci,*, vol 314, pp. 151-157., (2014)

128*. J. L. Bosse, P. D. Tovee, B. D. Huey, and O. V. Kolosov, Physical mechanisms of megahertz vibrations and nonlinear detection in ultrasonic force and related microscopies, *J Appl.Phys.,* 115, 144304 (2014);

127*. J. Mayes, C. Tinker-Mill, O. Kolosov, H. Zhang, B. J. Tabner and D. Allsop, β-Amyloid fibrils in Alzheimer's disease are not inert tombstones when bound to copper ions but can degrade hydrogen peroxide and generate reactive oxygen species, *J Biol. Chem.* (2014).

126*. Ahlstrom, S. L.; Bradley, D. I.; Fisher, S. N.; Guénault, A. M.; Guise, E. A.; Haley, R. P.; Holt, S.; Kolosov, O.; McClintock, P. V. E.; Pickett, G. R.; Poole, M.; Schanen, R.; Tsepelin, V.; Woods, A. J., A Quasiparticle Detector for Imaging Quantum Turbulence in Superfluid ^3He-B. *J Low Temp. Phys.* 1-14 (2014).

125*. B. Robinson, C. Rabot, R. Mazzocco, A. Delamoreanu, A. Zenasni, O. Kolosov, Nanomechanical mapping of graphene layers and interfaces in suspended graphene nanostructures grown via carbon diffusion, *Thin Solid Films,* vol 550, pp. 472–479. (2014).

124*. S. Ahlstrom, I. Bradley, M. Clovecko, T. Guénault, E.A. Guise, R. Haley, O. Kolosov, M. Kumar, P. McClintock, G. Pickett, E. Polturak, M. Poole, I.A. Todoshchenko, V. Tsepelin, A. Woods, Response of a Mechanical Oscillator in Solid 4He, *J J Low Temp. Phys.* (2013).

123*. A.B.G. Trabelsi, F.V. Kusmartsev, B. Robinson, A. Ouerghi, O.E. Kusmartseva, O. Kolosov, R. Mazzocco, M.B. Gaifullin, M. Oueslati, Charged nano-domes and bubbles in epitaxial graphene, *Nanotechnology,* 25 165704 (17pp) (2014).

122*. D. Sercombe, S. Schwarz, O. Del Pozo-Zamudio, F. Liu, B. J. Robinson, E. A. Chekhovich, I. I. Tartakovskii, O. Kolosov, A. I. Tartakovskii, Dielectric surface and capping effects on optical properties of a few atomic monolayer thick MoS2, *Nature Publishing Group, Scientific Reports,* vol 3, 03489. (2013).

121*. B. Robinson, N. Kay, O. Kolosov, Nanoscale interfacial interactions of graphene with polar and non-polar liquids, *Langmuir*, 29 7735-42 (2013)

120*. P.D. Tovee, O. V. Kolosov. Nanoscale resolution immersion scanning thermal microscopy, *Nanotechnology*, 24, *46*, 465706 9 pp. (2013).

119*. I. Grishin, B.D. Huey, O. Kolosov, Three-dimensional nanomechanical mapping of amorphous and crystalline phase transitions in phase change materials, *ACS Appl. Mater. Interfaces,* vol 5, no. 21, pp. 11441-11445. (2013)

118*. V. Parthsarathy, P.L. McClean, C. Hölscher, M. Taylor, C. Tinker, G. Jones, O. Kolosov, E. Salvati, M. Gregori, M. Masserini, D. Allsop, A novel retro-inverso peptide inhibitor reduces amyloid deposition, oxidation and inflammation and stimulates neurogenesis in the APPswe/PS1ΔE9 mouse model of Alzheimer's Disease, *PLoS ONE* 8, no. 1: e54769 (2013).

117*. Bosse, JL, Grishin, I, Kolosov, O & Huey, BD, 'Multidimensional SPM applied for Nanoscale Conductance Mapping' *J Mater. Res.* 28, *24* :pp. 3311-21 (2013).

116*. R. Stone, M.C. Rosamond, K. Coleman, M.C. Petty, O. Kolosov, L. Bowen, D.A. Zeze, Tungstate sharpening: A versatile method for extending the profile of ultra sharp tungsten probes, *Rev Sci. Instr.,* 84, No. 3, 28.03.2013, art. no. 035107 (2013).

115*. R. A. Robson, I. Grishin, R. Young, A.M. Sanchez, O. Kolosov, M. Hayne, High-accuracy analysis of nanoscale semiconductor layers using beam-exit Ar-ion polishing and SPM, *ACS Appl/ Mater. Interfaces,* (2013)

114*. M. E. Pumarol, P. Tovee, M.C. Rosamond, M. C. Petty, D. A. Zeze, V. Falko, and O. V. Kolosov, Direct nanoscale imaging of ballistic and diffusive thermal transport in graphene nanostructures, *Nano Letters*, 12 (6), pp 2906–11 (2012)

113*. D.I. Bradley, M. ˇCloveˇcko, S.N. Fisher, D. Garg, E. Guise, R.P. Haley, O. Kolosov, G.R. Pickett and V. Tsepelin, D. Schmoranzer, L. Skrbek, Crossover from hydrodynamic to acoustic drag on quartz tuning forks in normal and super liquid 4He, *Phys. Rev. B* 85, 014501 (2012).

112*. Tovee, Peter, Manuel E. Pumarol, D. A. Zeze, Kevin Kjoller, and O. Kolosov. Nanoscale Spatial Resolution Probes for Scanning Thermal Microscopy of Solid State Materials, *J. Appl. Phys.* 112, 114317 (2012)

111*. 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, , *Advanced Materials*, 23 5039-44 (2011)

110*. 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)

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106*. 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).

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96*. Charmot, D.; Mansky, P.; Kolosov, O.; Benoit, D.; Klarner, G.; Jayaraman, M.; Piotti, M.; Chang, H.T.; Nava-Salgado, V.. High throughput synthesis and screening in specialty polymers applications. *Polymer Preprints* (Amer Chem Society) 42(2), 627-628 (2001)

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4. *(revision requested)* R.Mazzocco, B. Robinson, J. Dickinson, C. Boxall and O. Kolosov, 'Dynamic Mesoscale Interfacial Characterisation of Graphene Films interaction with various environments using QCM and scanning probe microscopy', *Thin Solid Films* (2014)

3. (under review) B. J. Robinson, C. E. Giusca, Y. T. Gonzalez, N. D. Kay, O. Kazakova and O. V. Kolosov, Correlation of structural, nanomechanical and electrostatic properties of single and few-layers MoS2, *2D Materials* (2014)

2. (under review) Anyebe, E., Zhuang, Q., Rajpalke, M., Veal, Timothy; S., Robinson, B., Kolosov, O., Falko, V., Realisation of ultra-high aspect ratio, vertically-aligned InAs1-xSbx nanowires on graphitic substrates, *Nano Letters* (2014)

1. (submitted) Maria Gregori, Mark Taylor, Claire Tinker-Mill, Maria Michael, Oleg Kolosov, Elisa Salvati, Francesca Re, Stefania Minniti, Vanessa Zambelli, Massimo Masserini and David Allsop, Retro-inverso peptide inhibitor nanoparticles as highly potent inhibitors of aggregation of the Alzheimer's Aβ peptide, *Nature Nanotechnology* (2014).

ii.8) Most significant publications.

1*. Kay, N, Robinson, B, Falko, V, Novoselov, K & Kolosov, O, 'Electromechanical sensing of substrate charge hidden under atomic 2D crystals' *Nano Letters*, vol 14, no. 6, pp. 3400-04., (2014) http://pubs.acs.org/doi/abs/10.1021/nl500922h

2*. M. E. Pumarol, P. Tovee, M.C. Rosamond, M. C. Petty, D. A. Zeze, V.Falko, and O. V. Kolosov, Direct nanoscale imaging of ballistic and diffusive thermal transport in graphene nanostructures, *Nano Letters*, 12 (6), pp 2906–11 (2012) http://pubs.acs.org/doi/pdf/10.1021/nl3004946

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In all these papers I was the lead author providing key ideas for the paper; realising them either with the groups I collaborated with (4, 5) or in my own group (1-3).

I was on sabbatical leave in 2013-'14 Academic year (retaining teaching commitments during Lent Term 2014 for 11 weeks for the course I convened in 2012 - "2D materials Nanomechanics" teaching lab as no replacement could be found). Part of sabbatical was spent in LU lab supervising PhD students from the group and collaborating US institutions and visiting EU Marie Curie Fellows, and starting two new large scale grants (EPSRC EP/K023373/1 and EU QUANTIHEAT), and a spell at the University of Connecticut, CT, USA, initiating research at the interface of physical properties nano/micro characterization and biomedicine.

iii. UNDERGRADUATE AND POSTGRADUATE TEACHING, FEEDBACK/EVALUATION/RECOGNITION.

iii.1) Undergraduate teaching.

- **PHYS322** (Statistical Physics - core theoretical course for Y3 MPhys and BSc students). A new on-screen writing tablet-PC technology delivery coupled with fill-in hand-out sheets for derivations was introduced.
- **PHYS385** (Advanced Microscopy and Spectroscopy - options course for Y3/Y4 MPhys students). A new course was designed, convened and delivered. In-lab demonstrations were successfully introduced.
- Member of the final year Exam Committee, responsible for ~ 25% of final year exam papers.
- **MPhys supervision.** 5 MPhys project students, all students' projects were awarded first class marks.

iii.2) Postgraduate teaching and research supervision.

- "**2D Materials Nanomechanics" – a PG teaching lab** (within Lancaster-Manchester NowNANO DTC) – new type of teaching activity for the Physics Department was designed, convened and delivered.
- **PhD supervision.** Awarded – **4** (2009, 2012, 2013, 2014); Writing up - **1**, Current students - **4**.

iii.3) Feedback and evaluation.

PHYS322	Average student ratings	3.45
PHYS385	Average student ratings	4.21
"**2D Materials Nanomechanics**"	Average student ratings	4.75

iii.3) Accomplishments in teaching (2009 - present).

Departmental and Faculty of Science and Technology level achievements

2014 PhD 3rd year supervisee is awarded ***JUNO prize for Research Excellence*** at Physics Department.

2014 PhD 1st year supervisee is awarded 2014 ***Dean's Award for excellence in Ph.D. studies***.
2012 PhD 1st year supervisee is awarded ***JUNO prize for Research Excellence*** at Physics Department.
2011 PhD 2nd year supervisee was awarded 2011 ***Dean's Award for excellence in Ph.D. studies***.

Inter-University and National level achievements

2013 "**2D materials Nanomechanics**" teaching laboratory was rated among the top lab courses in University of Manchester – Lancaster University Joint *NowNANO* Doctoral Training Centre.
2012 MPhys project supervisee wins "***Best Physics Student of the Year Award"*** (SET Awards are the "… most important Science, Engineering and Technology awards for undergraduates" in UK**). Such award is won by the Lancaster University project student for the first time** across all University departments.
2010 MPhys project supervisee is nominated for "***Best Physics Student of the Year Award"*** - **first time for Lancaster Physics.**

ii.4) External teaching duties (2009 – present)

2009 – present **Ph.D. External Examiner**. University of Manchester, UK **(2010);** University of Manchester, UK **(2012)**; University of Leeds, UK **(2012**); University of Royal Holloway, UK **(2013)**, Leiden University, Belgium **(2014)**; University of Lyon, France **(**examining in **2015)**.
(2006-'13) **External Examiner, taught PG course** - Postgraduate Certificate in Nanotechnology, University of Oxford, UK

iv) SERVICE

ii.1) Departmental duties

from 2014 Director of Postgraduate Admissions and Postgraduate Studies.
from 2014 Head (interim) of Condensed Matter Experimental Research Division.
2008 – '13 Director of Postgraduate Admissions and Director of Postgraduate Studies.
2007 – '08 Deputy Director of Postgraduate Admissions and Postgraduate Studies.

ii.2) Summary of accomplishements (Director of PG Admissions and Studies 2008-'13)

- PG enrolment increased by ~ 50% from average 12-14 to ~20 p.a., notwithstanding a decrease of RCUK direct PG funding.
- The share of enrolment of self-funded and government-funded overseas students at Physics has increased to about 50%.
- Working closely with FST Graduate School Committee and University Graduate School I produced a paper for the PG entry requirements (language), resulting in new University-wide regulations.
- Created a new successful degree scheme of "*PhD in Nanoscience*" that is now responsible for 15% of Physics applications.
- Facilitated inter-university collaborations (with Manchester NowNANO and NowGRAPHENE doctoral training centres) contributing to new CDT bids and international collaborations in PhD training.

v) OTHER INFORMATION

v.1) Media reports related to research and teaching (2009 – present)

Year	Subject	Media reports
2014	New approach to explore pathogens in the early stages of Alzheimer decease	http://www.sciencedaily.com/releases/2014/04/140401122336.htm http://medicalxpress.com/news/2014-04-imaging-tool-insight-alzheimer.html http://www.labnews.co.uk/news/sewing-machine-inspires-imaging-tool-for-alzheimers/ http://www.thehealthsite.com/news/the-humble-sewing-machine-provides-fresh-insights-on-alzheimers-origins/ http://www.biotechniques.com/news/Tools-of-the-Trade/biotechniques-350276.html#.VFKMrPmsV8F
2014	New Lancaster spin-off in high-tech instrumentation	http://www.insidermedia.com/insider/north-west/111690-lancaster-university-launches-spin-out http://metrc.co.uk/news/latestnews/lancastermaterialsanalysis.aspx?p=1
2014	New Critical Mass EPSRC project in biomedicine	https://www.stfc.ac.uk/3007.aspx?p=1 http://www.myscience.org.uk/news/2014/a_brighter_future_for_cancer_diagnosis-2014-lancaster
2012	Top Physics Student of the Year Award to the supervised student	http://www.npl.co.uk/news/best-physics-student-of-2012 http://www.graphene-nownano.manchester.ac.uk/news-and-events/
2011	Patent applied for in high-tech field	http://www.highbeam.com/doc/1P3-2435666231.html
2010	Physics Student of the Year Award nomination to supervised student	http://www.lancaster.ac.uk/sci-tech/news/001008/