

*Nano-Forest Image by Principal Investigator
Dr Hongzhou Zhang*

INTRODUCTION

The Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN) is recognised internationally as a leading institute for nanoscience research. CRANN is focussed on the dual mandate of delivering world leading research and working in partnership with industry to deliver economic value for Ireland.

CRANN is based in Trinity College Dublin (TCD) and works in close partnership with Principal Investigators (PI) based within University College Cork (UCC). CRANN is comprised of a team of over 250 researchers, led by 17 PIs whom are based across many disciplines. These include the Schools of Physics, Chemistry, Medicine and Pharmacy.



The engine which drives the research activity at CRANN is the expertise inherent within the PI's groups. CRANN PIs have been attracted to Ireland from all over the world; all of who are internationally recognised researchers of the highest quality. They manage their own research groups, and play a full role in both the development of their School and the Institute.

CRANN's research spans the full research spectrum from discovery orientated to industry problem solving research. It encompasses everything from the development of new nanomaterials, with improved mechanical, magnetic, electrical or optical properties, to their subsequent application in electronic or medical devices, sensors, or new drug delivery systems. This institute provides an environment to develop and harness the cross-disciplinary nanoscience research of individual PIs. In addition, it encourages collaboration across PI groups, enabling researchers to address key challenges beyond the scope of an individual.

CRANN is central to all the primary nanoscience initiatives in Ireland. It is a Science Foundation Ireland Centre for Science Engineering and Technology (CSET), the lead institution in the Higher Education Authority supported INSPIRE consortium (www.inspirenano.ie) and finally a co-host, with the Tyndall National Institute, of the Enterprise Ireland / IDA established Competence Centre for Applied Nanotechnology (CCAN).

CRANN has two stand alone research facilities, the Naughton Institute and the CRANN Advanced Microscopy Laboratory, which provide nationally and internationally unique infrastructure capabilities coupled with specialist expertise. CRANN has active research relations with more than 150 research institutions in 30 countries around the world and is the primary driver in Ireland's global ranking of 6th in terms of both the quality of its publications and the volume output per capita. In addition CRANN carries out collaborative research programmes with more than 30 companies both nationally and internationally.

CRANN's vision is to be an internationally competitive research institute, recognised for its leading and innovative research and the value it provides to its industry partners and Ireland. The PIs are the leaders who have taken on the responsibility to deliver this vision. This booklet will provide an introduction to the 17 PIs at CRANN. We encourage both industry and academic researchers to contact our PIs for further information.

Dr Diarmuid O'Brien
Executive Director CRANN

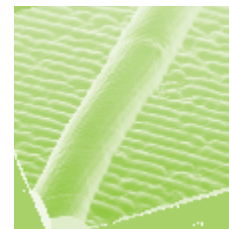
PRINCIPAL INVESTIGATORS





PROF JOHN J. BOLAND

DIRECTOR CRANN
PROFESSOR OF CHEMISTRY



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SELECTED PUBLICATIONS

Orbital Description of the Si(100) Surface: A Route to Symmetry-Allowed and Concerted [2+2] Cycloadditions

Ryan, P. M., Teague, L. C., **Boland, J. J.**,
Frontier Journal of the American Chemical Society 2009,
131 (19), 6768-6774.

Transparent, Flexible, and Highly Conductive Thin Films Based on Polymer - Nanotube Composites

De, S., Lyons, P. E., Sorel, S., Doherty, E. M., King, P. J.,
Blau, W. J., Nirmalraj, P. N., **Boland, J. J.**, Scardaci, V.,
Joimel, J., Coleman, J. N.,
Acs Nano 2009, 3 (3), 714-720.

Emergence and visualization of an interface state during contact formation with a single molecule Ryan, P. M., Teague, L. C., Naydenov, B., Borland, D., **Boland, J. J.**,

Physical Review Letters 2008, 101 (9).

Measuring the force of interaction between a metallic probe and a single molecule

Naydenov, B., Ryan, P., Teague, L. C., **Boland, J. J.**,
Physical Review Letters 2006, 97 (9).

Contact formation dynamics: Mapping chemical bond formation between a molecule and a metallic probe

Naydenov, B., Teague, L. C., Ryan, P., **Boland, J. J.**,
Nano Letters 2006, 6 (8), 1752-1756.

BIOGRAPHY

Prof John Boland received a BSc degree in chemistry from University College Dublin and a PhD in chemical physics from the California Institute of Technology, where he was an IBM graduate fellow and recipient of the Newby-McKoy graduate research award. From 1984 to 1994 Prof Boland was a member of the research staff at the IBM T.J. Watson Research Center (New York). In 1994 he joined the chemistry faculty at the University of North Carolina at Chapel Hill where he was appointed the J.J. Hermans Chair Professor of Chemistry and Applied and Materials Science. In 2002 Prof Boland moved to the School of Chemistry at Trinity College Dublin as a Science Foundation Ireland Principal Investigator. In 2004 he was appointed Director of the Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN).

RESEARCH INTERESTS

Prof Boland's research interests focus on understanding nanoscale processing and materials properties for advanced device applications, including the development of new protocols for assembling, fabricating, and testing nanometre-scale devices and sensors.

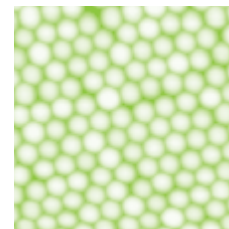
CRANN RESEARCH

Prof Boland is directly involved in CRANN's Integrated Nanoscale Devices research theme.



PROF J.M.D. COEY F.R.S.

PRINCIPAL INVESTIGATOR
ERASMUS SMITH'S PROFESSOR OF
NATURAL AND EXPERIMENTAL PHILOSOPHY



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SELECTED PUBLICATIONS

Donor impurity band exchange in dilute ferromagnetic oxides

Coey, J. M. D., Venkatesan, M., Fitzgerald, C. B.,
Nature Materials 2005, 4 (2), 173-179.

Unexpected magnetism in a dielectric oxide

Venkatesan, M., Fitzgerald, C. B., Coey, J. M. D.,
Nature 2004, 430 (7000), 630.

Influence of annealing on the bias voltage dependence of tunneling magnetoresistance in MgO double-barrier magnetic tunnel junctions with CoFeB electrodes

Feng, G., van Dijken, S., Coey, J. M. D.,
Applied Physics Letters 2006, 89 (16).

Internalisation of ferromagnetic nanowires by different living cells

Prina-Mello, A., Diao, Z., Coey, J. M.,
J. Nanobiotechnology. 2006, 4, 9.

Magnetic stabilisation and vorticity in submillimeter paramagnetic liquid tubes

Coey, J. M. D., Aogaki, R., Byrne, F., Stamenov, P.,
PNAS 9 A.D., 106 (22), 8811-8817.

BIOGRAPHY

Prof Michael Coey has degrees from universities in the UK, Ireland, France and Canada. After gaining his PhD in 1971 he was appointed Chargé des Recherches with the CNRS (Grenoble) and was visiting scientist at the IBM T. J. Watson Research Centre (New York) before moving to Trinity College Dublin in 1978, where he became Professor of Experimental Physics in 1987, and took up his present chair in 2007. He founded Magnetic Solutions Ltd. in 1994, and co-ordinated the Concerted European Action on Magnets from 1985–94. His SFI-funded project on Conception and Implementation of Nanoscale Spin Electronics (CINSE, 2001–2006) was followed by Magnetic Nanostructures and Spin Electronics project (MANSE 2006–2010.) Honours included the Charles Cree Medal, Institute of Physics (1997), the Gold Medal of the Royal Irish Academy (2005) and an honorary doctorate from Grenoble (1994). He has developed novel permanent magnets and contributed to the understanding of magnetism in both amorphous and natural materials. Current interests are centred on novel magnetic materials, spin electronics and the influence of magnetic fields on chemical and biological processes. An authority on magnetism and its applications, Prof Coey is the author of more than 600 scientific papers, 20 patents and several books, including a new textbook on *Magnetism and Magnetic Materials*, Cambridge University Press 2009.

RESEARCH INTERESTS

Prof Coey's research interests include magnetic, electronic and structural properties of solids, spin electronics, magneto-electrochemistry, amorphous materials, physical properties of minerals and permanent magnet applications.

CRANN RESEARCH

Prof Coey is involved in the CRANN research themes Spin Electronics & Sensors and BioNanoAssay & Sensing.

AWARDS

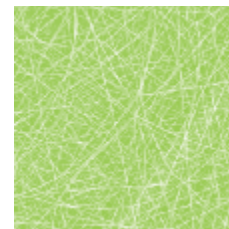
2003: Fellow of the American Physical Society
2003: Fellow of the Royal Society
2005: Foreign Associate of the National Academy of Sciences
2006: Distinguished Lecturer, IEEE Magnetics Society



PROF JONATHAN N. COLEMAN

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SELECTED PUBLICATIONS

High-yield production of graphene by liquid-phase exfoliation of graphite

Hernandez, Y., Nicolosi, V., Lotya, M., Blighe, F. M., Sun, Z. Y., De, S., McGovern, I. T., Holland, B., Byrne, M., Gun'ko, Y. K., Boland, J. J., Niraj, P., Duesberg, G., Krishnamurthy, S., Goodhue, R., Hutchison, J., Scardaci, V., Ferrari, A. C., **Coleman, J. N.**,

Nature Nanotechnology 2008, 3 (9), 563-568.

Mechanical reinforcement of polymers using carbon nanotubes

Coleman, J. N., Khan, U., Gun'ko, Y. K.,

Advanced Materials 2006, 18 (6), 689-706.

A generic organometallic approach toward ultra-strong carbon nanotube polymer composites

Blake, R., Gun'ko, Y. K., **Coleman, J. N.**, Cadek, M., Fonseca, A., Nagy, J. B., Blau, W. J.,
Journal of the American Chemical Society 2004, 126 (33), 10226-10227.

Reinforcement of polymers with carbon nanotubes:

The role of nanotube surface area

Cadek, M., **Coleman, J. N.**, Ryan, K. P., Nicolosi, V., Bister, G., Fonseca, A., Nagy, J. B., Szostak, K., Beguin, F., Blau, W. J.,
Nano Letters 2004, 4 (2), 353-356.

Super-tough carbon-nanotube fibres – These extraordinary composite fibres can be woven into electronic textiles

Dalton, A. B., Collins, S., Munoz, E., Razal, J. M., Ebron, V. H., Ferraris, J. P., **Coleman, J. N.**, Kim, B. G., Baughman, R. H.,
Nature 2003, 423 (6941), 703.

BIOGRAPHY

Prof Jonathan Coleman received his PhD from Trinity College Dublin Ireland in 1999.

After his PhD he was awarded a Higher Education Authority Research Fellowship to continue his research into polymer-nanotube composites. In 2001 he became a contract lecturer in the School of Physics, Trinity College Dublin. He was a visiting scientist at the Nanotech Institute at the University of Texas at Dallas in 2002. He is now an Associate Professor in the School of Physics, and was recently elected to fellowship of the College. Prof Coleman's main research theme is the study of one-dimensional nanostructures including carbon nanotubes and inorganic nanowires. One focus of this research is to understand the dispersion of these structures in novel solvents and solutions. This knowledge can then be used to fabricate advanced composites for electrical and mechanical applications.

RESEARCH INTERESTS

Prof Coleman's research interests include: liquid phase dispersion of carbon nanotubes, inorganic nanowires and graphene, polymer-nanotube composite formation techniques – especially preparation of high loading level composites, polymer-graphene composites, mechanical reinforcement of plastics, strengthening and toughening, conductive composites and nanostructured thin films.

CRANN RESEARCH

Prof Coleman is involved on the CRANN research themes Integrated Nanoscale Devices and BioNanoAssay & Sensing.

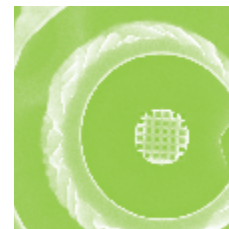
AWARDS

2007: Du Pont Science and Engineering Grant Award



DR GRAHAM CROSS

PRINCIPAL INVESTIGATOR
LECTURER



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SELECTED PUBLICATIONS

Molecular Confinement Accelerates Deformation of Entangled Polymers During Squeeze Flow

Rowland, H. D., King, W. P., Pethica, J. B.,

Cross, G. L. W.,

Science 2008, 322 (5902), 720-724.

Measuring glassy and viscoelastic polymer flow in molecular-scale gaps using a flat punch mechanical probe

Rowland, H. D., King, W. P., **Cross, G. L. W.,**

Pethica, J. B.,

Acs Nano 2008, 2 (3), 419-428.

Room temperature mechanical thinning and imprinting of solid films

Cross, G. L. W., O'Connell, B. S., Ozer, H. O.,

Pethica, J. B.,

Nano Letters 2007, 7 (2), 357-362.

The production of nanostructures by mechanical forming

Cross, G. L. W.,

Journal of Physics D-Applied Physics 2006, 39 (20), R363-R386.

Plasticity, healing and shakedown in sharp-asperity nanoindentation

Cross, G. L. W., Schirmeisen, A., Grutter, P., Durig, U. T.

Nature Materials 2006, 5 (5), 370-376

BIOGRAPHY

Dr Graham Cross received his PhD degree in condensed matter physics from McGill University in Montréal, Canada in 2000, where he performed research in nanomechanics via scanned probe and field ion microscopy methods in ultra-high vacuum. From 1999 to 2001 he was FCAR postdoctoral fellow at IBM Research in Zürich, Switzerland. There he investigated polymer deformation and relaxation at the nanoscale and helped characterise the operational window of the atomic-force-microscopy-based data storage project Millipede. After a brief stay at the University of Zürich working on single atom field emission, he joined the nanomechanics group at the SFI Nanoscience Laboratory in Trinity College Dublin in 2002. At Trinity College Dublin, Dr Cross has pursued a programme of understanding the rheological and tribological issues underlying massively parallel nanostructure fabrication by mechanical forming of soft condensed matter systems. His research interests include confined and large strain deformation behaviour of materials at the nanoscale, the production of nanodevices by mechanical forming, contact and transport at single asperities and structured interfaces, and point probe methods and instrumentation including nanoindentation and atomic force and field ion microscopy.

RESEARCH INTERESTS

Dr Cross's research interests include: multiscale mechanics – including tribology and plastic deformation at surfaces, interfaces and in confined volumes, production of shape and function in nanostructures, nanorheology of complex fluids and soft condensed matter systems including polymers, mechanics of transfer, placement, orientation, and sorting of nano-objects and the development of local and integrated nanoscale scanned probes and manipulators.

CRANN RESEARCH

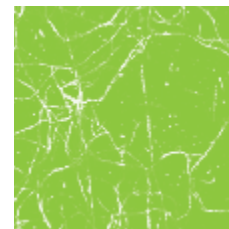
Dr Cross's main activity in CRANN's research is in the Integrated Nanoscale Devices theme.



PROF JOHN F. DONEGAN F.INST.P.

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SELECTED PUBLICATIONS

CdTe Nanoparticles Display Tropism to Core Histones and Histone-Rich Cell Organelles

Conroy, J., Byrne, S. J., Gun'ko, Y. K., Rakovich, Y. P., Donegan, J. F., Davies, A., Kelleher, D., Volkov, Y., *Small* 2008, 4 (11), 2006-2015.

Aqueous synthesis of thiol-capped CdTe nanocrystals: State-of-the-art

Rogach, A. L., Franzl, T., Klar, T. A., Feldmann, J., Gaponik, N., Lesnyak, V., Shavel, A., Eychmüller, A., Rakovich, Y. P., Donegan, J. F., *Journal of Physical Chemistry C* 2007, 111 (40), 14628-14637.

Nonfunctionalized nanocrystals can exploit a cell's active transport machinery delivering them to specific nuclear and cytoplasmic compartments

Nabiev, I., Mitchell, S., Davies, A., Williams, Y., Kelleher, D., Moore, R., Gun'ko, Y. K., Byrne, S., Rakovich, Y. P., Donegan, J. F., Sukhanova, A., Conroy, J., Cottell, D., Gaponik, N., Rogach, A., Volkov, Y., *Nano Letters* 2007, 7 (11), 3452-3461.

CdTe nanowire networks: Fast self-assembly in solution, internal structure, and optical properties

Rakovich, Y. P., Volkov, Y., Sapra, S., Susha, A. S., Doblinger, M., Donegan, J. F., Rogach, A. L., *Journal of Physical Chemistry C* 2007, 111 (51), 18927-18931.

Nanojets and directional emission in symmetric photonic molecules

Gerlach, M., Rakovich, Y. P., Donegan, J. F., *Optics Express* 2007, 15 (25), 17343-17350.

Radiation-pressure-induced mode splitting in a spherical microcavity with an elastic shell

Gerlach, M., Rakovich, Y. P., Donegan, J. F., *Optics Express* 2007, 15 (6), 3597-3606.

BIOGRAPHY

Prof John Donegan received BSc and PhD degrees from University College Galway in 1982 and 1986. He had post-doctoral appointments in Lehigh University, Bethlehem, the USA and in Max-Planck Institut für Festkörperforschung, Stuttgart, Germany. He was appointed to the academic staff in Trinity College Dublin in 1993 and is now a Fellow of Trinity College Dublin and Associate Professor of Physics. Prof Donegan is a fellow of the Institute of Physics and the Institute of Nanotechnology, a member of the IEEE and the American Physical Society. He is presently a member of the governing Board of Trinity College Dublin and is the Director of Research in the School of Physics. He has collaborations with Ludwig-Maximilians Universitaet Muenchen, University of Dresden, Université de Reims, and the Bell Laboratories, New Jersey. He has published 160 papers in journals and conference proceedings and has made 11 patent applications. The start-up company Eblana Photonics, which develops single-frequency diode lasers, has emerged from his research group.

RESEARCH INTERESTS

Professor Donegan's research deals with the interaction of light with matter. He has a diverse range of interests from widely tunable semiconductor lasers, two-photon absorption photodetectors, fluorescent nanowire formation, photonic molecules to quantum dots interactions with human cells and proteins. Across all these areas, the goal is the control and understanding of physical processes through coupling of light to photonic structures.

CRANN RESEARCH

Prof Donegan is involved in the research themes Integrated Nanoscale Devices and BioNanoAssay & Sensing.

AWARDS

1987: Chartered Physicist, Institute of Physics, London
2000: Fellow of Trinity College Dublin
2002: Fellow of Institute of Physics
2005: Fellow of the Institute of Nanotechnology
2008: Senior Member of the IEEE



PROF GEORG S. DUESBERG

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ASSOCIATE PROFESSOR



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SELECTED PUBLICATIONS

Low Temperature Graphene Growth

Kumar, S., McEvoy, N., Lutz, T., Keeley, G. P., Whiteside, N., Blau, W., **Duesberg, G. S.**,
ECS Transactions 2009, 19 (5), 175-181.

High-yield production of graphene by liquid-phase exfoliation of graphite

Hernandez, Y., Nicolosi, V., Lotya, M., Blighe, F. M., Sun, Z. Y., De, S., McGovern, I. T., Holland, B., Byrne, M., Gun'ko, Y. K., Boland, J. J., Niraj, P., **Duesberg, G. S.**, Krishnamurthy, S., Goodhue, R., Hutchison, J., Scardaci, V., Ferrari, A. C., Coleman, J. N.,
Nature Nanotechnology 2008, 3 (9), 563-568.

Sub-20 nm short channel carbon nanotube transistors

Seidel, R. V., Graham, A. P., Kretz, J., Rajasekharan, B., **Duesberg, G. S.**, Liebau, M., Unger, E., Kreupl, F., Hoenlein, W.,
Nano Letters 2005, 5 (1), 147-150.

Raman modes of index-identified freestanding single-walled carbon nanotubes

Meyer, J. C., Paillet, M., Michel, T., Moreac, A.; Neumann, A., **Duesberg, G. S.**, Roth, S., Sauvajol, J. L.,
Physical Review Letters 2005, 95 (21).

Polarized Raman spectroscopy on isolated single-wall carbon nanotubes

Duesberg, G. S., Loa, I., Burghard, M., Syassen, K., Roth, S.,
Physical Review Letters 2000, 85 (25), 5436-5439.

BIOGRAPHY

Prof Georg Duesberg graduated in Physical Chemistry from the University of Kassel, Germany. He worked at the Max-Planck-Institute Stuttgart and Trinity College Dublin from 1997–2001 on a collaborative European project, where he dealt with purifying, assembling and imaging carbon nanotubes. He was the first person to characterise individual carbon nanotubes by Raman spectroscopy. He received his PhD from the University of Tuebingen, Germany in 2000. From 2001–2005 he worked at the Infineon AG, Corporate Research Department, Munich, Germany. Here his research was focused on the integration of bottom-up structures grown into CMOS based devices. Wafer scale CVD, as well as the growth of individual nanotubes from lithographically defined nano-holes, are among his achievements. From 2005–2007 Prof Duesberg worked in the Thin Films Department of the Qimonda AG, Dresden, Germany on the implementation of new carbon nanostructured films into future DRAM technology. In July 2007 he moved to Dublin to take on a position as a Principal Investigator in CRANN and Associate Professor in the School of Chemistry, Trinity College Dublin. He is a recognised world leader in the area of the integration of carbon nanotubes into CMOS technology.

RESEARCH INTERESTS

A key element of Prof Duesberg's research is to merge top-down structuring techniques with the synthesis of functional nano-objects therein. The manufacture of such hybrids is a general vehicle to make new adaptive devices based on bottom-up grown nano-materials using the benefits of silicon structuring technologies. This approach employs state-of-the-art lithographic structuring, self-assembly techniques, and highly advanced nano-materials synthesis. The later is focused on CVD growth of carbon nanostructures taking benefit of their extraordinary stability and their fascinating electrical properties to assemble electrodes, switching, and sensor devices for ICT and energy and bio-medical applications.

CRANN RESEARCH

Prof Duesberg's involvement with CRANN's research is through the Integrated Nanoscale Devices theme.

AWARDS

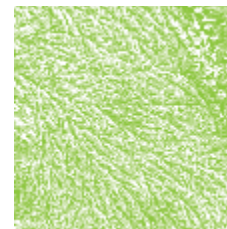
2007: ETS Walton Award



PROF YURII K. GUN'KO F.R.S.C.

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SELECTED PUBLICATIONS

A magnetic-nanoparticle-supported 4-N,N-dialkylaminopyridine catalyst: Excellent reactivity combined with facile catalyst recovery and recyclability

O' Dalaigh, C., Corr, S. A., **Gun'ko, Y. K.**, Connon, S. J., *Angewandte Chemie-International Edition* 2007, 46 (23), 4329-4332.

"Jelly dots": Synthesis and cytotoxicity studies of CdTe quantum dot-gelatin nanocomposites

Byrne, S. J., Williams, Y., Davies, A., Corr, S. A., Rakovich, A., **Gun'ko, Y. K.**, Rakovich, Y. R., Donegan, J. F., Volkov, Y., *Small* 2007, 3 (7), 1152-1156.

Synthesis, characterisation, and biological studies of CdTe quantum dot-naproxen conjugates

Byrne, S. J., le Bon, B., Corr, S. A., Stefanko, M., O'Connor, C., **Gun'ko, Y. K.**, Rakovich, Y. P., Donegan, J. F., Williams, Y., Volkov, Y., Evans, P., *Chemmedchem* 2007, 2 (2), 183-+.

The fabrication, fluorescence dynamics, and whispering gallery modes of aluminosilicate microtube resonators

Rakovich, Y. P., Balakrishnan, S., Donegan, J. F., Perova, T. S., Moore, R. A., **Gun'ko, Y. K.**, *Advanced Functional Materials* 2007, 17 (7), 1106-1114.

Chiral highly luminescent CdS quantum dots

Moloney, M. P., **Gun'ko, Y. K.**, Kelly, J. M., *Chemical Communications* 2007, (38), 3900-3902.

BIOGRAPHY

Prof Yurii Gun'ko graduated from the Chemistry Department of Moscow State University in 1987. He received his PhD degree in Inorganic Chemistry from Moscow State University in 1990. Then he worked as a Lecturer in Chemistry in Belorussian Institute of Technology (Belarus). In 1994 he took up a postdoctoral position in the group of Professor M.F. Lappert in the University of Sussex (UK). In 1995 he was awarded an Alexander von Humboldt fellowship and worked in the University of Magdeburg (Germany) with Professor F. T. Edelmann. Subsequently he returned to the University of Sussex. In 1999 Prof Gun'ko moved to the Chemistry Department of Trinity College Dublin to take up the position of Lecturer in Inorganic Chemistry. Currently he works as an Associate Professor in Inorganic Chemistry. To date Prof Gun'ko has 84 publications in peer reviewed journals and 6 patents.

RESEARCH INTERESTS

Prof Gun'ko works in the areas of inorganic chemistry, science of materials and nanotechnology. His main research interest and activities are: magnetic nanoparticles and magnetic fluids for MRI; metallasiloxanes; functionalisation of carbon nanotubes and quantum dots for biomedical applications.

CRANN RESEARCH

Prof Gun'ko's work directly links to both the Integrated Nanoscale Devices theme and the BioNanoAssay & Sensing theme.

AWARDS

2005: Fellow of Trinity College Dublin

2007: Fellow of Royal Society of Chemistry

2008: Enterprise Ireland Commercialisation Award



PROF MARTIN HEGNER

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SELECTED PUBLICATIONS

Quantitative time-resolved measurement of membrane protein-ligand interactions using microcantilever array sensors

Braun, T., Ghatkesar, M. K., Backmann, N., Grange, W., Boulanger, P., Letellier, L., Lang, H. P., Bletsch, A., Gerber, C., **Hegner, M.**,
Nature Nanotechnology 2009, 4 (3), 179-185.

Comprehensive Characterization of Molecular Interactions Based on Nanomechanics

Ghatkesar, M. K., Lang, H. P., Gerber, C., **Hegner, M. m. h. i.**, Braun, T. b. t. c.,
Plos One 2008, 3 (11), Article.

Detection of transient events in the presence of background noise

Grange, W., Haas, P., Wild, A., Lieb, M. A., Calame, M., **Hegner, M.**, Hecht, B.,
Journal of Physical Chemistry B 2008, 112 (23), 7140-7144.

VirE2: A unique ssDNA-compacting molecular machine

Grange, W., Duckely, M., Husale, S., Jacob, S., Engel, A., **Hegner, M.**,
Plos Biology 2008, 6 (2), 343-351.

Interaction of cationic surfactants with DNA: a single-molecule study

Husale, S., Grange, W., Karle, M., Burgi, S., **Hegner, M.**,
Nucleic Acids Research 2008, 36 (5), 1443-1449.

BIOGRAPHY

Prof Martin Hegner received MSc and PhD Life science degrees from the Swiss Federal Institute of Technology Zurich in 1989 and 1994. He had post-doctoral appointments at the Institute of Physics University of Basel, Howard Hughes medical research laboratory in Eugene OR, and the University of California, Berkeley. He was appointed to the academic staff at the University of Basel in 1999, where he built up an interdisciplinary biophysics team in the department of Physics. In 1991 he received the Venia Docendi in experimental physics and became a fellow of the new National Center of Competence in Nanoscale Science Research in the University of Basel. In autumn 2007 he moved his research team to Trinity College Dublin to take up a position as Principal Investigator in CRANN, and Professor in the School of Physics.

RESEARCH INTERESTS

Prof Hegner's research focus is in the area of leading edge interdisciplinary bioanalytics where he invents simple yet elegant instruments and tools for deciphering biological information. His approach involves leveraging new label-free cantilever array sensors and microfluidic devices to create novel platforms for quantitative diagnostics and evaluation of therapies in molecular medicine.

CRANN RESEARCH

Prof Hegner's work contributes to the BioNanoAssay & Sensing research theme.

AWARDS

1999: Treubel Stiftung Habilitations fellowship
2001: Fellow of NCCR Nanoscale Science; University of Basel
2001: ELTEM Regio lecturer position in Nanoscale Science
2004: Science Prize of the State of Basel, Switzerland 2004
2008: Stokes Award, SFI Ireland

For more information see: <http://www.tcd.ie/Physics/People/Martin.Hegner/index.html>



DR JUSTIN D. HOLMES

PRINCIPAL INVESTIGATOR

SENIOR LECTURER



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SELECTED PUBLICATIONS

Two-Terminal Nanoelectromechanical Devices Based on Germanium Nanowires

Andzane, J., Petkov, N., Livshits, A. I., Boland, J. J., Holmes, J. D., Erts, D.,
Nano Letters 2009, 9 (5), 1824-1829.

Single Crystalline Ge₁xMnx Nanowires as Building Blocks for Nanoelectronics

van der Meulen, M. I., Petkov, N., Morris, M. A., Kazakova, O., Han, X. H., Wang, K. L., Jacob, A. P., Holmes, J. D.,
Nano Letters 2009, 9 (1), 50-56.

Copper/molybdenum nanocomposite particles as catalysts for the growth of bamboo-structured carbon nanotubes

Li, Z., Larsson, J. A., Larsson, P., Ahuja, R., Tobin, J. M., O'Byrne, J., Morris, M. A., Attard, G., Holmes, J. D.,
Journal of Physical Chemistry C 2008, 112 (32), 12201-12206.

Confined growth and crystallography of one-dimensional Bi₂S₃, CdS, and SnS_x nanostructures within channeled substrates

Petkov, N., Xu, J., Morris, M. A., Holmes, J. D.,
Journal of Physical Chemistry C 2008, 112 (19), 7345-7355.

Mesoporous titania nanotubes: Their preparation and application as electrode materials for rechargeable lithium batteries.

Wang, K. X., Wei, M. D., Morris, M. A., Zhou, H. S., Holmes, J. D.,
Advanced Materials 2007, 19 (19), 3016-+.

BIOGRAPHY

Dr Holmes is a Senior Lecturer in Physical/Materials Chemistry at University College Cork (UCC), Ireland. Since joining the Chemistry Department at UCC in October 1999, he has established an active research group in the synthesis and assembly of nanoscale materials for electronic, magnetic, environmental and biological applications. Dr Holmes is a Principal Investigator within the Centre for Adaptive Nanostructures and Nanodevices (CRANN), based at Trinity College Dublin, where he leads a research strand in the development of new materials for nanoscale electronic applications. He is also a Principal Investigator and Group Leader of the *Materials and Supercritical Fluids Group* at the Tyndall National Institute in Cork, investigating the applications of nanoscale magnetic and ferroelectric materials. Dr Holmes is co-founder, and currently a member of the Scientific Advisory Board, for the UCC spin-out company Glantreo Ltd.

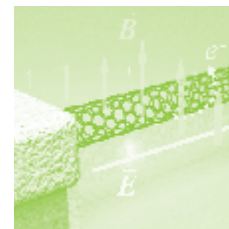
RESEARCH INTERESTS

Dr Holmes current research portfolio consists of projects in the following areas: the synthesis, characterisation and assembly of nanoscale materials for electronic and magnetic applications, high surface area crystalline mesoporous materials for use in energy conversion and storage devices, the exploitation of nanoscale materials for environmental clean-up and the development of nanoscale materials with prescribed biological properties.



DR VOJISLAV KRSTIĆ

PRINCIPAL INVESTIGATOR
LECTURER



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SELECTED PUBLICATIONS

Graphene-metal interface: Two-terminal resistance of low-mobility graphene in high magnetic fields

Krstić, V., Obergfell, D., Hansel, S., Rikken, G. L. J. A., Blokland, J. H., Ferreira, M. S., Roth, S.,
Nano Letters 2008, 8 (6), 1700-1703.

Strong magneto-chiral dichroism in enantiopure chiral ferromagnets

Train, C., Gheorghe, R., Krstić, V., Chamoreau, L. M., Ovanesyan, N. S., Rikken, G. L. J. A., Gruselle, M., Verdaguer, M.,
Nature Materials 2008, 7 (9), 729-734.

Nitrogen doping of metallic single-walled carbon nanotubes: n-type conduction and dipole scattering

Krstić, V., Rikken, G. L. J. A., Bernier, P., Roth, S., Glerup, M.,
Epl 2007, 77 (3).

Momentum transfer from quantum vacuum to magnetoelectric matter

van Tiggelen, B. A., Rikken, G. L. J. A., Krstić, V.,
Physical Review Letters 2006, 96 (13).

Magneto-chiral anisotropy in charge transport through single-walled carbon nanotubes

Krstić, V., Roth, S., Burghard, M., Kern, K., Rikken, G. L. J. A.,
Journal of Chemical Physics 2002, 117 (24), 11315-11319.

BIOGRAPHY

Dr Vojislav Krstić received his diploma in physics from the Ruprecht-Karls-University in Heidelberg in 1998. Afterwards he carried out his PhD thesis at the Max-Planck-Institute for Solid-State-Research in Stuttgart and obtained his PhD degree in 2002 from the Ecole Polytechnique Fédérale de Lausanne. From 2002 to 2005 he held a post-doctoral position at the High Magnetic Field Laboratory in Grenoble and also conducted several projects at the European Synchrotron Radiation Facility. In 2003 Dr Krstić became Chargé de Recherche of the Centre National de la Recherche (CNRS) in France and moved to the National Pulsed Magnetic Field Laboratory in Toulouse. In mid 2007 he joined CRANN as Principal Investigator and holds a lecturer position in the School of Physics.

RESEARCH INTERESTS

Dr Krstić's research interests are focused around transport phenomena in low-dimensional nano-scaled materials. This includes (magneto-) transport and photo-conductivity experiments on single nano-objects, mono-atomic layers and nano-structured objects. His current research fields are the experimental investigation of intrinsic charge-and-spin transport properties of one-dimensional (1D) nanowires, organic thin films and (nanostructured) graphene. He also looks at the contact properties of 1D nanowires, with higher-dimensional electrodes in view of novel approaches to nano-devices designs (contact-determined two-terminal devices), and magnetochiral and magnetoelectric transport effects in chiral and multiferroic nano-objects, respectively.

CRANN RESEARCH

Dr Krstić's work is in the Spin Electronics & Sensors and Integrated Nanoscale Devices research themes.

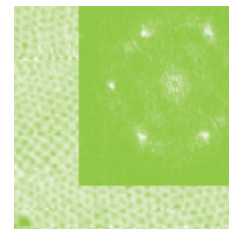
AWARDS

2007: Stokes Award



PROF MICHAEL A. MORRIS

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SELECTED PUBLICATIONS

Ordered mesoporous silicate structures as potential templates for nanowire growth.

Rice, R. L., Arnold, D. C., Shaw, M. T., Iacopina, D., Quinn, A. J., Amenitsch, H., Holmes, J. D., **Morris, M. A.**, *Advanced Functional Materials* 2007, 17 (1), 133-141.

Polymer nanostructures in sub-micron lithographically defined channels: film-thickness effects on structural alignment of a small feature size polystyrene-polyisoprene-polystyrene block copolymer.

Fitzgerald, T. G., Borsetto, F., O'Callaghan, J. M., Kosmala, B., Holmes, J. D., **Morris, M. A.**, *Soft Matter* 2007, 3 (7), 916-921.

Dynamic stable nanostructured metal oxide fractal films grown on flat substrates

Chen, L., Xu, J., Fleming, P., Holmes, J. D., **Morris, M. A.**, *Journal of Physical Chemistry C* 2008, 112 (37), 14286-14291.

Facile and controlled synthesis of ultra-thin low dielectric constant meso/microporous silica films

Farrel, R. A., Petkov, N., Cherkaoui, K., Amenitsch, H., Holmes, J. D., Hurley, P. K., **Morris, M. A.**, *Chemphyschem* 2008, 9 (11), 1524-1527.

Synthesis and characterisation of dimensionally ordered semiconductor nanowires within mesoporous silica

Coleman, N. R. B., O'Sullivan, N., Ryan, K. M., Crowley, T. A., **Morris, M. A.**, Spalding, T. R., Steytler, D. C., Holmes, J. D., *Journal of the American Chemical Society* 2001, 123 (29), 7010-7016.

BIOGRAPHY

Prof Michael Morris graduated with a PhD from Liverpool University in 1982. He was a post-doctoral fellow at Imperial College in London before moving to Strathclyde University in 1987 as a lecturer. Following Strathclyde, he took an ICI endowed lectureship at Cardiff University for research into surface science and catalysis. This was followed by a move to ICI as a research scientist with particular interest in developing high temperature catalysts and during this period he worked with academic groups in Cambridge, Nottingham, UMIST and Edinburgh. He was appointed to a post in Materials Chemistry at UCC in 1993 and he is currently the chair of Inorganic and Materials Chemistry. Prof Morris is also a Principal Investigator at the Tyndall National Institute. He has close industrial links with several companies including Intel that have supported his work in several of these fields. He is a founding director of the spin-out company Glantreo that has developed technology in the area of mesoporous materials.

RESEARCH INTERESTS

Current research interests are associated with the synthesis of nanomaterials (including nanowires) and nanostructured materials (including mesoporous and nanostructured block copolymers), their subsequent characterisation and application. A primary focus of his work is the use of thin film templates to facilitate placement and dimensional management of nanostructures so enabling structure and property control. Within CRANN these techniques are being used to form novel advanced transistor circuitry and examining how this might be integrated into existing wafer technology. A research programme has been established for the use of this nanoscience to generate new applications in environmental technologies.

CRANN RESEARCH

Prof Morris leads the Integrated Nanoscale Devices research theme and contributes to the Spin Electronics & Sensors theme.

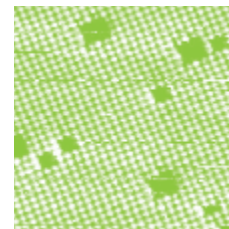
AWARDS

1986: RSC C R Burch Prize for Surface Chemistry
2005: Analytical X-ray scientist of the year



PROF JOHN PETHICA F.R.S.

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PROFESSOR



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SELECTED PUBLICATIONS

Molecular Confinement Accelerates Deformation of Entangled Polymers During Squeeze Flow

Rowland, H. D., King, W. P., **Pethica, J. B.**, Cross, G. L. W.,
Science 2008, 322 (5902), 720-724.

Simultaneous normal and shear measurements of nanoconfined liquids in a fiber-based atomic force microscope

Matei, G., Jeffery, S., Patil, S., Khan, S. H., Pantea, M., **Pethica, J. B.**, Hoffmann, P. M.,
Review of Scientific Instruments 2008, 79 (2).

Local force gradients on Si(111) during simultaneous scanning tunneling/atomic force microscopy

Ozer, H. O., O'Brien, S. J., **Pethica, J. B.**,
Applied Physics Letters 2007, 90 (13).

Room temperature mechanical thinning and imprinting of solid films

Cross, G. L. W., O'Connell, B. S., Ozer, H. O., **Pethica, J. B.**,
Nano Letters 2007, 7 (2), 357-362.

Influence of elastic strains on the mask ratio in glassy polymer nanoimprint

Cross, G. L. W., O'Connell, B. S., **Pethica, J. B.**,
Applied Physics Letters 2005, 86 (8).

BIOGRAPHY

John Pethica graduated from the University of Cambridge with BA & PhD in physics. He was a staff scientist at Brown Boveri Co., Switzerland from 1980 to 1982, and then held Fellowships at Cambridge till 1987. He was Lecturer, then Professor (1996) of Materials Science at the University of Oxford. He became an SFI Research Professor at Trinity College Dublin in November 2001. He was the founding director of CRANN, serving till 2005. Prof Pethica is the originator of novel AFM, STM and nano-indentation techniques. He founded and ran Nano Instruments Inc., Knoxville, USA, 1984-98. He is presently part time Chief Science Advisor to the National Physical Laboratory, UK, and from Dec. 2009, Physical Sciences Secretary of the Royal Society.

RESEARCH INTERESTS

Prof Pethica's research interests are in the fields of surfaces, thin films, atom and nano-scale structures with special interest in nanomechanics – SPM atomic resolution imaging, molecule manipulation, and the formation of nanoscale structures by mechanical deformation.

CRANN RESEARCH

Prof Pethica's research is linked to CRANN's Integrated Nanoscale Devices research theme.

AWARDS

1997: Rosenhain Medal, Institute of Materials
1999: Fellow of the Royal Society
2001: Hughes Medal, Royal Society
2002: Holweck Medal, French Physics Society



PROF MAREK W. RADOMSKI

PRINCIPAL INVESTIGATOR

CHAIR OF PHARMACOLOGY (1979) SCHOOL OF PHARMACY
AND PHARMACEUTICAL SCIENCES / HEAD OF SCHOOL OF
PHARMACY AND PHARMACEUTICAL SCIENCES



SCHOOL AFFILIATION: School of Pharmacy and Pharmaceutical Sciences, T.C.D.
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TELEPHONE: +353.1.896 2819

SELECTED PUBLICATIONS

Release of gelatinase A during platelet activation mediates aggregation

Sawicki, G., Salas, E., Murat, J., Misztal, H.,
Radomski, M. W.,
Nature 1997, 386 (6625), 616-619.

Nanoparticle-induced platelet aggregation and vascular thrombosis

Radomski, A., Jurasz, P., Alonso-Escolano, D., Drews, M., Morandi, M., Malinski, T., **Radomski, M. W.**,
British Journal of Pharmacology 2005, 146 (6), 882-893.

Nanoparticles: pharmacological and toxicological significance

Medina, C., Santos-Martinez, M. J., Radomski, A., Corrigan, O. I., **Radomski, M. W.**,
British Journal of Pharmacology 2007, 150 (5), 552-558.

The transcription factor Wilms tumor 1 regulates matrix metalloproteinase-9 through a nitric oxide-mediated pathway

Marcet-Palacios, M., Ulanova, M., Duta, F., Puttagunta, L., Munoz, S., Gibbins, D., **Radomski, M. W.**, Cameron, L., Mayers, I., Befus, A. D.,
Journal of Immunology 2007, 179 (1), 256-265.

Doxycycline is more effective than, atenolol to prevent thoracic aortic aneurysm in marfan syndrome by improving aortic elastic property and attenuating calcification through the inhibition of matrix metalloproteinases

Chung, A. W., Yang, C. H., Dietz, H. C., **Radomski, M. W.**, van Breemen, C.,
Circulation 2007, 116 (16), 593.

BIOGRAPHY

Prof Marek Radomski is a medical graduate of the College of Medicine Jagiellonski University in Krakow, Poland where he also received his PhD in Pharmacology. He has worked in both academia and the pharmaceutical industry in Poland, UK, Spain, Canada and the USA. He joined the School of Pharmacy, Trinity College Dublin in 2006 as Professor and Chair of Pharmacology and has served as Director of Research in School of Pharmacy, currently he is also Head of School. His group investigates biocompatibility, therapeutic, pharmacological and diagnostic applications of nanoparticles, including possible detrimental and toxicological actions of nanoparticulate matter. They have long-standing expertise in the biology of biological mediators that may be involved in these interactions and bring unique expertise in bionanointeractive research to CRANN. Prof Radomski is also interested in pharmacological development of novel agents for the treatment of thrombosis, chronic inflammation and cancer. He is a highly cited pharmacologist with 29 papers cited more than 100 times. He has 106 original contributions, authored 47 books or book chapters, 31 reviews, 77 abstracts and given 164 invited lectures.

RESEARCH INTERESTS

Prof Radomski's research interests include nanopharmacology, nanotoxicology, nanoparticles, nitric oxide, matrix metalloproteinases, platelets, inflammation, cancer.

CRANN RESEARCH

Prof Radomski's work contributes to the BioNanoAssay and Sensing research theme.

AWARDS

1994: Alberta Heritage Foundation for Medical Research Scholar
2000: Candian Institutes of Health Research Scientist
2001: Senior Scientist Award The Pharmacological Society of Canada
2004: Outstanding Pioneers of Physiology Medal awarded by the Polish Physiological Society.
2005: World Innovation Foundation Fellow
2006: Master in Arts (iure officii) Trinity College Dublin, Ireland
2007: Trinity College Dublin Fellow
2009: Doctor Honoris Causa Complutense University, Madrid, Spain



PROF STEFANO SANVITO

DEPUTY DIRECTOR OF CRANN
PRINCIPAL INVESTIGATOR
ASSOCIATE PROFESSOR



SCHOOL AFFILIATION: School of Physics, T.C.D.
EMAIL: stefano.sanvito@tcd.ie
TELEPHONE: +353.1.896 3065

SELECTED PUBLICATIONS

Towards molecular spintronics.

Rocha, A. R., Garcia-Suarez, V. M., Bailey, S. W., Lambert, C. J., Ferrer, J., **Sanvito, S.**,
Nature Materials 2005, 4 (4), 335-339.

Spin and molecular electronics in atomically generated orbital landscapes

Rocha, A. R., Garcia-Suarez, V. M., Bailey, S., Lambert, C., Ferrer, J., **Sanvito, S.**,
Physical Review B 2006, 73 (8).

Atomic-orbital-based approximate self-interaction correction scheme for molecules and solids

Pemmaraju, C. D., Archer, T., Sanchez-Portal, D., **Sanvito, S.**,

Physical Review B 2007, 75 (4).

Predicting d(0) magnetism: Self-interaction correction scheme

Droghetti, A., Pemmaraju, C. D., **Sanvito, S.**,
Physical Review B 2008, 78 (14).

Resonant electronic states and I-V curves of Fe/MgO/Fe(100) tunnel junctions

Rungger, I., Myasov, O., **Sanvito, S.**,
Physical Review B 2009, 79 (9).

BIOGRAPHY

Prof Stefano Sanvito completed his undergraduate studies in Milan (Italy), before moving to the University of Lancaster (UK), where he obtained a PhD in Theoretical Physics. In 2002 he joined the School of Physics, Trinity College Dublin as a contract lecturer, after having spent two successful years as postdoctoral fellow at the University of California Santa Barbara (USA). In 2006 he became Associate Professor in Physics. At Trinity College Dublin he created the Computational Spintronics Group, a large and dynamical theoretical/computational research group that investigates elementary properties of materials and of nano-devices using computer simulations. He is the author of over ninety publications including pioneering works on molecular spin-valves and on the ferromagnetism of diluted magnetic semiconductors. Prof Sanvito is a Fellow of Trinity College Dublin.

RESEARCH INTERESTS

Prof Sanvito's main research lines are magnetism and quantum transport. His group is leading the Smeagol consortium, which develops and maintains the ab initio quantum transport package Smeagol (www.smeagol.tcd.ie).

CRANN RESEARCH

Prof Sanvito's work spans all three research themes: Spin Electronics & Sensors, Integrated Nanoscale Devices and BioNanoAssay & Sensing.

AWARDS

2005: Elected to the board of the International Union of Pure and Applied Physics (IUPAP) commission on magnetism

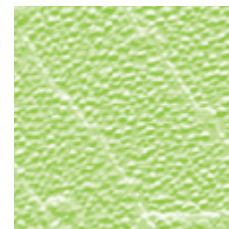
2006: Trinity College Fellow

2007: IUPAP Young Scientist Medal in Computational Physics (September 2007)



PROF IGOR SHVETS

PRINCIPAL INVESTIGATOR
PROFESSOR



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SELECTED PUBLICATIONS

Plasmon Resonance in Silver Nanoparticles Arrays Grown by Atomic Terrace Low-Angle Shadowing
Cuccureddu, F., Murphy, S., **Shvets, I. V.**, Porcu, M., Zandbergen, H. W.,
Nano Letters 2008, 8 (10), 3248-3256.

Room-Temperature Self-Assembly of Equilateral Triangular Clusters via Friedel Oscillations
Manai, G., Radican, K., Delogu, F., **Shvets, I. V.**,
Physical Review Letters 2008, 101 (16).

Electrically driven phase transition in magnetite nanostructures
Lee, S., Fursina, A., Mayo, J. T., Yavuz, C. T., Colvin, V. L., Sofin, R. G. S., **Shvets, I. V.**, Natelson, D.,
Nature Materials 2008, 7 (2), 130-133.

Topographic and Magnetic-Sensitive Scanning Tunneling Microscope Study of Magnetite
Wiesendanger, R., **Shvets, I. V.**, Burgler, D., Tarrach, G., Guntherodt, H. J., Coey, J. M. D., Graser, S.,
Science 1992, 255 (5044), 583-586.

Atomically resolved spin-dependent tunneling on the oxygen-terminated Fe₃O₄(111)
Berdunov, N., Murphy, S., Mariotto, G., **Shvets, I. V.**,
Physical Review Letters 2004, 93 (5).

BIOGRAPHY

Prof Igor Shvets graduated from the leading technical educational establishment in the USSR, the Moscow Institute of Physics and Technology, in 1986. He obtained his PhD in solid-state physics in 1989 and came to Ireland in 1990 where he has been working in the School of Physics, Trinity College Dublin, first as Lecturer, then as Associate Professor and since 2007 as Professor of Applied Physics. Prof Shvets is interested in magnetic oxides and their applications for spin electronics, which may become a key technology in the future for IT development. His research interests also include conducting oxides, electronic and magnetic properties of nanowire arrays. Prof Shvets is co-author of over 100 publications and over 50 patents and patent applications. In 2000, he co-founded a commercial company Deerac Fluidics, to develop cutting-edge instrumentation for the pharmaceutical industry and medical diagnostics and in 2006 he co-founded the company Cellix specialising in microfluidic technologies.

RESEARCH INTERESTS

Prof Shvets' research interests encompass the study of the magnetic and electron transport properties of magnetic nanostructures and interfaces, nano-engineered defects in epitaxial films, and oxide surfaces and interfaces and their electronic properties.

CRANN RESEARCH

Prof Shvets leads the Spin Electronics & Sensors theme.

AWARDS

2005 & 2006: Trinity College Dublin Entrepreneur-Academic of the Year



DR PLAMEN STAMENOV

PRINCIPAL INVESTIGATOR

USSHER LECTURER



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SELECTED PUBLICATIONS

High-field Anisotropy of the Tunnelling Magnetoresistance of CoFeB/MgO/CoFeB Junctions

P. Stamenov, K. Oguz and J.M.D. Coey
JMMM (2010), **322**, 1413-1415 doi:10.1016/j.jmmm.2009.09.042

On the direct magnetic detection of spin injection and adiabatic depolarization in aluminium

P. Stamenov and J.M.D. Coey
JMMM (2008) **320**, 403-406 doi:10.1016/j.jmmm.2007.06.024

Magnetoresistance of Co-doped ZnO thin films

P. Stamenov, M. Venkatesan, L. S. Dorneles, D. Maude, and J. M. D. Coey
J. Appl. Phys. (2006) **99**, 08M124
doi:10.1063/1.2172194

Sample size, position, and structure effects on magnetization measurements using second-order gradiometer pickup coils

P. Stamenov and J. M. D. Coey
Rev. Sci. Instrum. (2006) **77**, 015106
doi:10.1063/1.2149190

Magnetic susceptibility of carbon—experiment and theory

P. Stamenov and J.M.D. Coey
JMMM (2005) **290** (1), 279-285 doi:10.1016/j.jmmm.2004.11.209

BIOGRAPHY

Dr Plamen Stamenov received a BSc degree from the University of Sofia (Bulgaria) in Theoretical and Experimental Physics in 2002, with research work on the magnetic and structural properties of some manganese perovskites. He completed his PhD research in 2007 under the supervision of Prof. J. M. D. Coey in Trinity College Dublin. This research focused on metals, semimetals and semiconductors for spin electronics applications. After completing his PhD, he stayed on in Trinity College as a research fellow and teaching assistant within the School of Physics and CRANN conducting research in the field of spin-dependent transport, and collaborating with industry in applied magnetics and microwave technology. In 2010, Dr Stamenov became an Ussher Lecturer in Physics and Principal Investigator within CRANN in the area of nanomagnetism.

RESEARCH INTERESTS

Dr Stamenov's research interests include the development of Andreev reflection spectroscopy methodology, general spin electronics, magnetic bipolar transistors, ferromagnetic resonance-based structures and devices, and novel magnetic materials.

CRANN RESEARCH

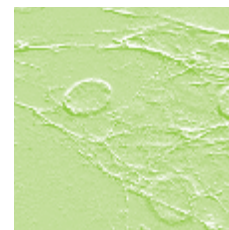
Dr Stamenov is involved in the CRANN research theme Spin Electronics and Sensors



PROF YURI VOLKOV

PRINCIPAL INVESTIGATOR

ASSOCIATE PROFESSOR IN MOLECULAR MEDICINE



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SELECTED PUBLICATIONS

STAT3-Stathmin Interactions Control Microtubule Dynamics in Migrating T-cells

Verma, N. K., Dourlat, J., Davies, A. M., Long, A., Liu, W. Q., Garbay, C., Kelleher, D., **Volkov, Y.**, *Journal of Biological Chemistry* 2009, 284 (18), 12349-12362.

CdTe Nanoparticles Display Tropism to Core Histones and Histone-Rich Cell Organelles

Conroy, J., Byrne, S. J., Gun'ko, Y. K., Rakovich, Y. P., Donegan, J. F., Davies, A., Kelleher, D., **Volkov, Y.**, *Small* 2008, 4 (11), 2006-2015.

Nonfunctionalized nanocrystals can exploit a cell's active transport machinery delivering them to specific nuclear and cytoplasmic compartments

Nabiev, I.; Mitchell, S.; Davies, A.; Williams, Y.; Kelleher, D.; Moore, R., Gun'ko, Y. K., Byrne, S., Rakovich, Y. P., Donegan, J. F., Sukhanova, A., Conroy, J., Cottell, D., Gaponik, N., Rogach, A., **Volkov, Y.**, *Nano Letters* 2007, 7 (11), 3452-3461.

"Jelly dots": Synthesis and cytotoxicity studies of CdTe quantum dot-gelatin nanocomposites

Byrne, S. J., Williams, Y., Davies, A., Corr, S. A., Rakovich, A., Gun'ko, Y. K., Rakovich, Y. R., Donegan, J. F., **Volkov, Y.**, *Small* 2007, 3 (7), 1152-1156.

Crucial importance of PKC-beta(I) in LFA-I-mediated locomotion of activated T cells

Volkov, Y., Long, A., McGrath, S., Eidhin, D. N., Kelleher, D., *Nature Immunology* 2001, 2 (6), 508-514.

BIOGRAPHY

Prof Yuri Volkov was born in Moscow, Russia. He received his MD from the Moscow Medical Academy and subsequently a PhD in biomedical sciences at the Institute of Immunology, Moscow. He has been working at the Department of Clinical Medicine, Trinity College Dublin since 1995 as a Research Fellow, Lecturer, Senior Lecturer and subsequently – Associate Professor. Prof Volkov is also currently one of the Principal Investigators at the Institute of Molecular Medicine, TCD. His research interests for a number of years have been focused in leukocyte biology, mechanisms of inflammation and cell adhesion receptors functioning in immune defence and disease development. Recently, he has made a key contribution into the development of a large-scale interdisciplinary alliance between the Trinity College Schools of Medicine, Physics, and Chemistry in the area of NanoMedicine, opening the opportunities to design new nanoscale diagnostic and drug delivery systems. Prof Volkov's group is currently involved in research towards developing the applications of nanomaterials for advanced research, cell and molecular imaging and medical applications. Prof Volkov is the Trinity College's lead partner of the EU-funded Consortium NanoInteract and of the SFI strategic research cluster BioNanoInteract.

RESEARCH INTERESTS

Prof Volkov's research interests include leukocyte adhesion and migration, intracellular signaling, cytoskeletal dynamics and live cell and organelle imaging technologies, biomedical applications of nanotechnology and surface science, magnetic barcodes for ultrasensitive biomarker detection, nanoparticle interactions with live cells, organelles and extracellular structures and new nanoscale drug delivery systems.

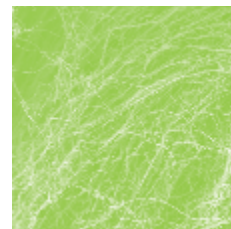
CRANN RESEARCH

Prof Volkov is the CRANN PI in the BioNanoAssay & Sensing research theme.



DR HONGZHOU ZHANG

PRINCIPAL INVESTIGATOR
STOKES LECTURER



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SELECTED PUBLICATIONS

Nano Au-decorated boron nitride nanotubes: Conductance modification and field-emission enhancement

Chen, H., **Zhang, H. Z.**, Fu, L., Chen, Y., Williams, J. S., Yu, C., Yu, D. P.,
Applied Physics Letters 2008, 92 (24).

Eu-doped boron nitride nanotubes as a nanometer-sized visible-light source

Chen, H., Chen, Y., Li, C. P., **Zhang, H. Z.**, Williams, J. S., Liu, Y., Liu, Z. W., Ringer, S. P.,
Advanced Materials 2007, 19 (14), 1845-+.

Growth and structure of prismatic boron nitride nanorods

Zhang, H. Z., Fitzgerald, J. D., Chadderton, L. T., Yu, J., Chen, Y.,
Physical Review B 2006, 74 (4).

Patterned growth and cathodoluminescence of conical boron nitride nanorods

Zhang, H. Z., Phillips, M. R., Fitzgerald, J. D., Yu, J., Chen, Y.,
Applied Physics Letters 2006, 88 (9).

Efficient field emission from ZnO nanoneedle arrays

Zhu, Y. W., **Zhang, H. Z.**, Sun, X. C., Feng, S. Q., Xu, J., Zhao, Q., Xiang, B., Wang, R. M., Yu, D. P.,
Applied Physics Letters 2003, 83 (1), 144-146.

BIOGRAPHY

Dr Hongzhou Zhang received a MSc and PhD in physics from Peking University (China) and Rice University (US) in 1996 and 1999, respectively. From 2002 to 2004 he held a post-doctoral position at the National Laboratory of Mesoscopic Physics and Electron Microscopy (Peking University, China). In 2004 he became a research fellow in the Electronic Materials Engineering Department at the Australian National University (Australia). He joined CRANN as a Principal Investigator in 2009 and holds a Stokes Lecturer position in the School of Physics, TCD.

RESEARCH INTERESTS

Dr Zhang's current research is primarily focused on developing new ultramicroscopy methodologies, specifically helium ion microscopy, for nanoscale metrology. It involves the contrast mechanism of ion-microscopy images, in-situ microscopy, and e-beam/ion beam nanoscale machinery. The major objective is to further understand the interaction of charged particles with materials and thus to develop methodologies for material characterisation and manipulation.

CRANN RESEARCH

Dr Zhang's work contributes to the themes concerning nanoscale characterisation.

AWARDS

2005: National Science and Technology Progress Award, China

2009: Stokes Award

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By Luas: Take the Red line to the Spencer Dock Stop,
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St, Grand Canal Quay.
By Dart: Grand Canal Dock Station or Pearse
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