

**University of Windsor  
Senate Steering Committee**

4.1.2: **A Proposal to Establish the University of Windsor Institute for Diagnostic Imaging Research**

Item for: **Approval**

Forwarded by: **Program Development Committee**

**MOTION:** That the proposal to establish the *University of Windsor Institute for Diagnostic Imaging Research* be approved.

Submitted by: **Dr. Roman Maev  
Professor, Department of Physics  
Dr. Ranjana Bird  
Vice-President, Research**

*See attached.*

# University of Windsor Institute for Diagnostic Imaging Research

## Executive Summary

### Introduction

The format of the proposal herein for the University of Windsor Institute for Diagnostic Imaging Research is in accordance with the requirements set out in Senate Policy I2.

The University of Windsor Institute for Diagnostic Imaging Research (the “Institute”) is a multi-disciplinary collaborative research and innovation consortium dedicated to the development of innovative diagnostic imaging technologies and products using advanced and diverse imaging techniques. The Institute will develop intellectual property that will strengthen the University’s ability to directly help diversify the region’s economic sectors and increase the general competitiveness of the local region.

The Institute will foster a multi-sectoral approach involving the University of Windsor, private and public sector partners, and all levels of government to create an environment where collaborative researchers and partners can combine their efforts in a synergistic manner to drive innovation and success. The Institute will conduct novel and innovative imaging research that can be commercialized through technology transfer initiatives that include the private sector and the development of spin-off companies.

The Institute will provide a common space and specialized project-oriented infrastructure resources that researchers can share so as to enhance their innovation productivity. The Institute will work proactively to attract new research and innovation funding for new projects while growing the membership of the Institute. There will be opportunities for the University to benefit from the commercialization of intellectual property and to develop highly qualified personnel (HQP) with professional maturity in areas that can diversify the region’s economy.

The Institute’s area of focus encompasses the development of a variety of imaging technologies and application areas such as, diagnostic, research, quality control and security applications. Funding has been provided in the amount of \$5,000,000 from the Province of Ontario Ministry of Research and Innovation to establish the Institute and carry out three initial imaging projects that will use acoustical energy to acquire the images. The initial three projects funded by the Ministry will lead to: (a) new high-value non-destructive testing systems for many industrial applications including quality assurance; (b) new high-value non-intrusive imaging systems for medical diagnostics; and (c) new high-value biometric imaging systems for identification and security applications.

The establishment of an Institute as opposed to a Centre is mandated by the Province of Ontario Ministry of Research and Innovation to ensure that the higher standards of governance required of an Institute are complied with. The Institute reports to the Vice-President, Research.

## **Proposal to Establish a University of Windsor Institute**

### **(a) Name of Proposed Institute**

University of Windsor Institute for Diagnostic Imaging Research

### **(b) Primary Objectives of the Proposed Institute for the First Five Years.**

The primary objectives of the Institute for the first five years are:

1. Carry out specific research and innovation projects in the Institute's area of focus that will deliver new high-value products in relevant sectors that can be readily commercialized in the global economy.
2. Create collaborative partnerships in the local region, in Canada and internationally that will maximize the Institute's effectiveness and leverage strategic investments.
3. Promote a rapid exchange of knowledge between the Institute and private sector partners in a manner that protects intellectual property and supports commercialization.
4. Act as an incubator for establishing new spin-off companies in the area of advanced diagnostic and testing imaging techniques.
5. Diversify the region's economic sectors and increase the general competitiveness of the area's manufacturing sector.
6. Attract new research and innovation funding for new projects while growing the membership of the Institute.
7. Foster the development and teaching of new multidisciplinary courses by Institute members in their home faculties at both undergraduate and graduate levels that are complimentary to the Institute's research and innovation activities.
8. Provide the opportunity for internships as part of providing new learning and growth opportunities for students.
9. Aid Institute members in providing high quality supervision and mentoring for the graduate students involved with the Institute.
10. Produce highly qualified and skilled persons with enhanced professional maturity in the area of diagnostic imaging systems and the associated core-enabling areas of technology.

### **(c) Names, positions, and *curricula vitae* of members of the proposed Institute, together with a statement describing the nature and extent of their proposed participation in the new Institute.**

Funding in the amount of \$5,000,000 was announced January 7, 2008, by John Wilkinson, the Ontario Minister of Research and Innovation, to establish a new Institute for Diagnostic Imaging Research at the University of Windsor. Membership in the Institute is contingent on the research and innovation projects approved by the Institute and can not be determined in advance of the establishment of the Institute. The research and innovation efforts of the Institute are carried out within the framework of projects that have been approved by the Vice-President, Research on the recommendation of the Director of the Institute. All Institute members will be associated with an Institute project. Membership in the Institute will consist of the Principal Investigator for each Institute project together with faculty members and other qualified persons working on an Institute project as approved by the project's Principal Investigator and the Director of the Institute.

Once the Institute has been established, outstanding candidates working in the Institute's areas of focus will be invited to become Institute members by developing a new Institute project and acting as Principal Investigators, or join as members working on one or more of the three inaugural research and innovation projects funded (\$4,850,000) by the Province of Ontario Ministry of Research and Innovation.

**(d) Procedure for selection of the membership in the Institute and Institute Council.**

**Vice-President, Research**

Membership in the Institute is based on whether the candidate is carrying out research and innovation within the framework of an Institute project approved by the Vice-President, Research on the recommendation of the Director of the Institute.

Membership on the Institute's Advisory Council is determined in accordance with the governance structure of the Institute. The Institute's governance, management and operation are accountable to the Vice-President, Research. The Vice-President, Research is responsible for ensuring that an effective governance and management structure is in place for the Institute that is in compliance with stakeholder requirements.

**Board of Directors**

A seven (7) person Board of Directors will be responsible for the oversight and monitoring of the management of the Institute and its research and innovation projects. The Board of Directors will receive comprehensive reports on the conduct of the research and innovation projects, monitor performance metrics, ensure compliance with funding agency and University requirements, and provide guidance and advice. The following are the members of the Board of Directors: (a) the Vice-President, Research of the University of Windsor or delegate; (b) The Director of the Institute; and (c) Five external directors with the requisite skills and experience. The Vice-President, Research is responsible for approving the membership of the Board of Directors which will carry out the required oversight and monitoring of the Institute. The Chair of the Board of Directors will be appointed by the Vice-President, Research for a term of three years, renewable.

**Advisory Council**

An Institute Advisory Council will also be constituted to represent stakeholders within the University and external community and will include some of the Institute's high-profile members. The role of the Advisory Council is to provide input and advice to the Director and Principal Investigators on: strategic directions, partnerships, commercialization and sources of funding. Members of the Advisory Council will be appointed by the Board of Directors on the recommendation of the Director and will serve for a one year term, renewable as determined by the Board. The Advisory Council does not have operational or fiduciary responsibilities.

**(e) Name, present position, and *curriculum vitae* of the proposed Director.**

**1. Director of the Institute**

The Director of the Institute leads the management team and provides the general operational and strategic oversight of the Institute. The Director reports to the Vice-President, Research. In addition to his responsibilities as Principal Investigator for the projects, Dr. Roman Maev will serve as the Founding Director of the Institute for a special term of 5 years from start-up to enable the Institute to be fully established and functioning. The directorship will be reviewed by the Board of Directors at the end of five years and, upon majority approval, will continue for five additional years. Following the end of second five-year term, the directorship may be renewed annually based on majority approval. If the directorship is not renewed, an election will be held by the Board to recommend a Director to the Vice-President, Research for a three-year term, renewable.

The Director of the Institute functions as the Chief Executive Officer and is the Chair of the Management team. The Director of the Institute is responsible for providing general leadership regarding the strategic direction of the Institute, for managing the achievement of Institute goals and objectives, for finding new opportunities for research, innovation projects and funding, for facilitating research programs, for enacting the plans of the Management Team, and for coordinating Project planning and resource allocation and the daily operation of the Institute.

An Associate Director may be appointed, based on an appointment process established by the Board of Directors.

## 2. Curriculum Vitae

# Curriculum Vitae



## Roman Grigorievich Maev, Ph.D.

### Center for Imaging Research and Advanced Materials Characterization

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### PERSONAL INFORMATION

Place of Birth: Moscow, Russia  
Date of Birth: May 23, 1945  
Citizenship: Canadian  
Languages: English, Russian (spoken and written)

### EDUCATION

<u>Degree</u>	<u>Institution</u>	<u>Thesis Field</u>	<u>Year</u>
Full Professor in Physics	Russian Federation Government Diploma	<i>Scientific Equipment and Methods for Experimental Physics</i>	2005
Dr. Sc.	Russian Academy of Sciences	<i>Methods of Acoustic Microscopy for Investigation of Microstructure, Physical and Chemical Properties of Materials</i>	2002
Ph.D.	Physical P.N. Lebedev Institute of the USSR Academy of Sciences	<i>Theory of Photo-Semiconductor Physics</i>	1973
Post-Graduate Student	Moscow Physical Technical University, Russia.	<i>Semiconductors and Acoustoptics</i>	1969-72
M.Sc. Combined with B.Sc.	Moscow Physical Engineering Institute, Russia	<i>Theoretical Solid State and Nuclear Physics</i>	1969
Undergrad Student	Moscow Institute of Radioelectronics, Russia		1962-63

### APPOINTMENTS AND PROFESSIONAL POSITIONS

<u>Institution</u>	<u>Position</u>	<u>Year</u>
University of Windsor, Windsor, Ontario, Canada Faculty of Science	University Professor.	2006-present
University of Windsor, Windsor, Ontario, Canada Department of Electrical Engineering	Full Faculty Professor – Cross Appointment.	2006-present
University of Windsor, Windsor, Ontario, Canada Department of Physics	Chair holder, NSERC/DaimlerChrysler/University of Windsor Industrial Research Chair in Applied Solid State Physics and Material Characterization.	2002-present
University of Windsor, Windsor, Ontario, Canada Department of Physics	Director, DaimlerChrysler Canada/University of Windsor Centre for Imaging Research and Advanced Materials Characterization.	1997-present
University of Windsor, Windsor, Ontario, Canada Department of Physics	Full Faculty Professor with Tenure, Head, Ultrasonic Research Laboratory.	1996-present

Russian Academy of Sciences, Moscow, Russia	Director, International Advanced Material Study Centre.	1987/97
Institute of Chemical Physics of the USSR Academy of Sciences	Head of the Laboratory of Biophysical Introscopy.	1984-87
Moscow Technical University, Russia	Deputy Chief of the Chair, Associate Professor of Applied Physics and Biophysics.	1984
Moscow Physical Technical University, Russia	Deputy-Chief of the Chair, Assistant at Moscow Physical Technical University.	1978-84
National Scientific and Research Institute for Physical-Technical and Radio-technical Measurements	Researcher.	1974-78
Physical Lebedev Institute of the USSR Academy of Sciences	Researcher.	1969-73

#### **ADDITIONAL EDUCATION AND PROFESSIONAL EXPERIENCE**

2007-present	<b>Member, IEEE Administrative Committee.</b>
2006-present	<b>Member, Board of Directors “The Ontario BioCar Initiative”</b>
2005-present	<b>Associate Editor, Journal IEEE Transactions on Ultrasound, Ferroelectrics and Frequency Control.</b>
2004-present	<b>Member, Quality Control Chapter of USCAR Organization</b>
2004-present	<b>Member of Editorial Board, Journal of the American Society for Nondestructive Testing “Research in Nondestructive Evaluation”.</b>
2001-present	<b>Adjunct Professor, CNDE Johns Hopkins University, Baltimore, Maryland, USA.</b>
1995-present	<b>Member and Scientific Consultant, Advanced Working Group, Canada-Russia Intergovernmental Economic Commission.</b>
1999-02	<b>Adjunct Professor, Material Department, Dental School, University of Michigan, Ann Arbor, Michigan, USA.</b>
1996-99	<b>Adjunct Professor, Department of Electrical Engineering, McGill University, Montreal, Quebec, Canada.</b>
1995-99	<b>Adjunct Professor, Department of Industrial and Manufacturing Systems Engineering and Department of Physics, University of Windsor, Windsor, Ontario, Canada.</b>
1992-94	<b>Scientific Consultant, Technological Non-Profit Marketing Venture Project “Hi-Tech from Russia”, Supported by Siemens AG and Daimler-Benz, AG Germany, together with the Russian Academy of Sciences, Moscow, Russia.</b>
1994-95	<b>Visiting Professor, Ultrasonic Microscopy Lab, University of Windsor, Windsor, Ontario, Canada.</b>
1993	<b>Guest Researcher, National Institute of Standards and Technology, United States Department of Commerce, Washington, D.C., USA (3 mo.).</b>
1992, '93, '96	<b>Visiting Professor, Hafei University, Hafei, Republic of China (2 mo. each).</b>
1991	<b>Visiting Professor, Institute of Experimental Physics, Frieie Universitaet, Berlin, Germany (3 mo.).</b>
1990	<b>Visiting Professor, Institute of Physics, Federal Air Force, University of Munich, Germany (3 mo.).</b>
1989	<b>Visiting Professor, Department of Electronics, Kyoto University, Kyoto and Tohoku University, Sendai, Japan (3 mo.).</b>
1988, '91	<b>Visiting Professor, Department of Material Sciences, Oxford University, Oxford, United Kingdom (3 mo. each).</b>

#### **MEMBERSHIPS, PROFESSIONAL ORGANIZATIONS**

2006-present	<b>Member, American Society for Nondestructive Testing (ASNT) National Research Council.</b>
2005-present	<b>Member, Brockhouse Institute for Materials Research at McMaster University.</b>
2004-present	<b>Member, Quality Control Panel of USCAR.</b>
2001-2005	<b>Chairman, Division of Industrial and Applied Physics, Canadian Association of Physicists.</b>
2001-2004	<b>Panel Member, Ontario Graduate Scholarship (OGS).</b>
2001-2004	<b>Member, Imaging Expert Group, Canadian Foundation Innovation.</b>
2001-present	<b>Senior Member, American Society for Nondestructive Testing.</b>
1999-present	<b>Member, Program Committee for Acoustical Imaging Symposium.</b>
1998-present	<b>Member, Technical Program Committee (TPC) for IEEE Ultrasonics Symposium.</b>
1998-present	<b>Full Member, Acoustical Society of America.</b>
1996-present	<b>Member, Canadian Association of Physicists.</b>
1995-present	<b>Senior Member, IEEE.</b>
1994-present	<b>Member, Canadian Acoustical Association.</b>
1991-present	<b>Member, Non-Ionization Radiation International Expert Group of the World Health Organization (WHO).</b>
1991-present	<b>Member, Acoustical Society of Russia.</b>
1982-present	<b>Member, Scientific Council, Russian Academy of Sciences on the Problem of Acoustics.</b>
2004	<b>Panel Chair, Ontario Graduate Scholarship (OGS).</b>

- 2003-04 **Member**, Program Committee and Chair of two Sessions of the World Congress in NDT, July 2004, Montreal, Quebec, Canada.
- 2001 **Chairman**, 26<sup>th</sup> International Acoustical Imaging Symposium, September 2000, Windsor, Ontario, Canada.
- 2000-01 **Vice-Chair**, Division of Industrial and Applied Physics, Canadian Association of Physicists.
- 2000 **Chairman**, Symposium on Physical Sciences and Advanced Vehicle Technologies, June 2000, Toronto, Ontario, Canada.
- 1999-01 **Councilor**, Ontario-Southwest, Council of Canadian Association of Physicists.
- 1988-92 **Member**, Scientific Council of the USSR Academy of Sciences on the Problem of the High-Temperature Superconductive Materials.
- 1985-94 **Member**, Organization Committee of Few West Germany - Soviet Union Bilateral Scientific Seminars.
- 1974-84 **Member**, Program Committee and Organization Secretary All-National Soviet Union Regular Scientific School "Actual Problems of Physics".
- 1988-98 **Chief**, Commission of Young Scientists in National Russian Chemical Society.
- 1980-96 **Member**, United Nations (UN) Commission on the Problem: "Man and the Biosphere".
- 1974-84 **Member**, Central Council of the Young Scientist Society of the USSR.

#### MEMBERSHIPS, UNIVERSITY OF WINDSOR

- 2006-present **Member**, Department of Physics – Promotion, Tenure and Review Committee
- 2005-present **Member**, Curriculum Committee
- 2005-present **Member**, Machine Shop Committee
- 2005-present **Member**, Graduate Advisory Committee
- 2003-present **Member**, University of Windsor Graduate Faculty Council
- 2003-present **Member**, Graduate Council Executive Committee
- 2004-06 **Member**, University of Windsor Senate
- 2004-06 **Member**, Program Development Senate Committee
- 2001-05 **Member**, Liaison Research Council and Research Advisory Council
- 1997-02 **Member**, Executive Committee for the School of Physical Sciences

#### INVITED AND KEYNOTE PRESENTATIONS AT INTERNATIONAL CONGRESSES AND SYMPOSIUMS

- 52 Advanced Physical Mechanical Methods for Evaluation of Biopolymer Microstructure, Review. Research Workshop "The Ontario BioCar Initiative", Windsor, Ontario, November 9, 2007.
- 51 Nonlinear Acoustic methods for Nondestructive Evaluation. Davidson Laboratory, Stevens Institute of Technology, New Jersey, USA, October 26, 2007.
- 50 High Resolution Ultrasonic Imaging for Biomedical Diagnostics. Faculty of Nano medicine, Imperial College, London, UK, October 12, 2007.
- 49 New Generation of High Resolution Ultrasonic Imaging Technique for Advanced Material Characterization. Review. Russian Academy of Sciences, St Petersburg, October 6, 2007.
- 48 Innovative NDT Imaging technique for Automotive Applications, Basic Element Corp., Moscow, Russia, October 3, 2007,
- 47 High Resolution Ultrasonic Imaging.Current Development Review. Magna Powertrain, Graz, Austria, September 19, 2007.
- 46 New Generation of High Resolution Ultrasonic Imaging Techniqes for Material Characterization and NDT in Automotive Manufacturing. Review. American Society for Nondestructive Testing (ASNT) National Conference in Automotive Industry Advancements with NDT, Dearborn, Michigan, USA, May 16, 2007.
- 45 High Resolution Ultrasonic Imaging. Current Development Review. Honda Electronics, Koyhuku, Japan, April 2007.
- 44 New Generation of High Resolution Ultrasonic Imaging Technique for Advanced Material Characterization. Review. International Symposium on Acoustical Imaging, Kanagawa, Japan, April 18, 2007.
- 43 High Resolution Ultrasonic Imaging. Current Development Review. Magna International, Gratz, Austria, April 2007.
- 42 New Generation of High Resolution Ultrasonic Imaging Technique for Advanced Material Characterization. Review. International Congress on Ultrasonics, Vienna, Austria, April 12, 2007.
- 41 High Resolution Ultrasonic Imaging. Current Development Review. Renault Technology Center, Paris, France, April 2007.
- 40 High Resolution Ultrasonic Imaging. Current Development Review. Dassault Aviation, Paris, France, April 2007.
- 39 High Resolution Ultrasonic Imaging. Current Development Review. Workshop in Advanced Materials, New York City, USA, February 2007.

- 38 High Resolution Ultrasonic Imaging. Current Development Review. Ford Science Lab, Dearborn, Michigan, USA, January 2007.
- 37 New Generation of High Resolution Ultrasonic Imaging Technologies for Material Characterization and NDT. Review. Keynote Speech, 9<sup>th</sup> European Conference on Nondestructive Testing (NDT), Berlin, Germany, September 25-29, 2006.
- 36 New Nondestructive Methods for Advanced Material Characterization. Invited Lecture, International Seminar within European Advanced Material International Seminars Network (AMAS-ISN) Network "New Materials for Advanced Applications", Poznan, Poland, September 18-21, 2006.
- 35 New Generation of High-Resolution Ultrasonic Imaging Technique for Material Characterization and NDT in Automotive Manufacturing. Invited Lecture, Annual Congress of British Institute of Non-Destructive Testing, Stratford, United Kingdom, September 12-14, 2006.
- 34 Recent Advances in High Resolution Acoustic Imaging for Biomaterials Evaluation National Institute of Health (NIH). Department of Radiology, Bethesda, Maryland, USA, July 20, 2006.
- 33 Pulmonary Diagnostic Device, US Office of Naval Research, Biocentric Technology Program Review. Stress Physiology Review. Arlington, Virginia, USA, July 19-21, 2006.
- 32 Ultrasonic Imaging of Brain Structures and Blood Vessels through Thick Skull Bones, US Office of Naval Research, Biocentric Technology Program Review. Stress Physiology Review. Arlington, Virginia, USA, July 19-21, 2006.
- 31 New Generation of High Resolution Ultrasonic Imaging Technique and Methods for Materials Characterization. Review. Invited Lecture, Canadian Association of Physicists Annual Congress, Brock University, St. Catharines, Ontario, Canada, June 12, 2006.
- 30 New Generation of Resistant Spot Welding Analyzers. Invited Lecture, Workshop at Ford Science Laboratory, Dearborn, Michigan, USA, June 26, 2006.
- 29 Radial Injection Gas Dynamic Spray Technology Potential for Different Applications. Review. Invited Lecture, International Thermal Spray Conference (ITSC), Seattle, Washington, USA, May 2006.
- 28 Recent Developments in High-Resolution Acoustic Imaging for Biomedical Applications. Invited Lecture, Workshop at Institute for Biodiagnostics, National Research Council Canada, Winnipeg, Manitoba, Canada, March 29-30, 2006.
- 27 Recent Developments in Acoustic Imaging Inspection, Material Characterization and NDT in Automobile Manufacturing. Invited Lecture, Proceedings of American Society for Nondestructive Testing (ASNT) National Research Council Spring Meeting, Orlando, Florida, USA, March 13-16, 2006.
- 26 New Generation of High Resolution Ultrasonic Imaging Techniques for Material Characterization. Review. Proceedings of 11<sup>th</sup> National Congress of Nondestructive Testing, Milan, Italy, October 13-15, 2005.
- 25 Progress in High-Resolution Acoustic Imaging Technique for Material Characterization and NDT. Proceedings of 3<sup>rd</sup> International workshop "NDT in Progress", Prague, Czech Republic, October 10-12, 2005.
- 24 New Development in High Resolution Ultrasonic Imaging Technique for NDE and Joints Quality Control (Review). DaimlerChrysler Corp. International Tech Fair, Auburn Hills, Michigan, USA, September 2005.
- 23 Physics and Art: Look Inside. Invited Lecture, Abstract Book of 2005 Canadian Association of Physicists Congress, University of British Columbia, Vancouver, British Columbia, Canada, 100, 2005.
- 22 Recent Advances in Quantitative Acoustic Microscopy. Review. Fundamentals of Spatio-Temporal Fourier Spectroscopy in Quantitative Acoustic Microscopy. Acoustical Imaging, Saarbrücken, Germany, 27: 407-415, 2004.
- 21 New Generation of High Resolution Acoustical Imaging Technique for Material Characterization and NDT. Proceedings of 16<sup>th</sup> World Congress on Non Destructive Testing, Montreal, Quebec, Canada, 6, 2004.
- 20 New Development in High Resolution Acoustic Imaging for Material Evaluation. Invited paper, Proceedings of 5<sup>th</sup> World Congress on Ultrasound, Paris, France, 42, 2003.
- 19 Recent Development in Quantitative Acoustic Microscopy Methods. Review. Proceedings of Annual Canadian Association of Physicists Congress, Charlottetown, Prince Edward Island, Canada, June 17, 2003.
- 18 Acoustic Visualization and Characterization of Thin Interface Deterioration in Adhesive Bond Joints: Theory and Experiment. Proceedings of 3rd International Conference on Emerging Technologies in Non-Destructive Testing, Athens, Greece, 127-136, 2003.
- 17 New Development in Nonlinear Inspection and Materials Evaluation Based on Quantitative Ultrasonic Technique for Vehicle Quality Control. Review. Nondestructive Characterization of Materials XI, Proceedings of 11th International Symposium, Berlin, Germany, 641-650, 2002.
- 16 Nonlinear Acoustic Imaging. Tutorial. Topics on Nondestructive Evaluation Series, American Society for Nondestructive Testing (ASNT) Publication, Baltimore, Maryland, USA, 6: 73-82, 2002.



- 15 Monitoring of Pulsed Ultrasonic Waves' Interaction with Metal Continuously Heated to the Melting Point. Review of Progress in Quantitative Nondestructive Evaluation, 20B: 1517-1525, 2001.
- 14 Nonlinear Acoustic Imaging and Quantitative Acoustic Microscopy. Review. Proceedings of Annual Canadian Association of Physicists Congress, Victoria, British Columbia, Canada, 72, June 2001.
- 13 Physical Sciences and Advance Vehicle Technologies. Review. Workshop of the Dunsmuir Workshop of Division of Industrial and Applied Physics, Canadian Association of Physicists, (CD Proceeding), Victoria, British Columbia, Canada, 2001.
- 12 Quantitative Acoustic Imaging. Review. Sonix Workshop, Proceeding, Alexandria, Virginia, USA, 23, 2001.
- 11 Nondestructive Evaluation (NDE) and Quality Monitoring of Resistant Spot Welding Based on Quantitative Ultrasonic Technique. Automotive and Transportation Technology Congress and Exhibition, Barcelona, Spain, 4: 33-41, 2001.
- 10 Recent Development in Acoustic Imaging Inspection, Ultrasonic Material Characterization and Quality Control. International Symposium on Automotive Technology and Automation (ISATA), Dublin, Ireland, 121-128, 2000.
- 9 Advanced Materials Characterization and NDT Control. International Symposium on Automotive Technology and Automation, 1996.
- 8 Acoustic Microscope Characterization of Interface Behavior on Composite Materials. Proceedings of International Workshop on Modern Acoustics, 40th Anniversary of Institute of Acoustics, Nanjing University, Nanjing, China, 11-17, 1994.
- 7 Transmission Acoustic Microscopy Investigation. Acoustical Imaging, 19: 679-683, 1992.
- 6 Acoustic Scanning Microscopy for Investigation of Subsurface Defects. Proceedings of Symposium "Soviet Technology", Tokyo, Japan, 92-94, 1991.
- 5 Basic Principles of Output Signal Formation in Transmission Raster Acoustic Microscopy. Transaction of the Royal Microscopical Society, Micro'90, Adam Hilger Press, 1: 75-80, 1990.
- 4 Einsatz der Akustomikroskopie in den Materialwissenschaften. Review. Proceedings of the FRG-USSR (West Germany) Bilateral seminar "Microscopy in Material Sciences", Moscow, 35-51, 1988.
- 3 Acoustic Microscopy. Real States and Perspectives. Review Bulletin of USSR Academy of Sciences, 2: 74-84, 1988.
- 2 Acoustic Microscopy of Biological Objects. Proceedings of the VII International Symposium "UBIOMED-VII" WB 1986/73, Eisenach, DDR (East Germany), 145-146, 1986.
- 1 Principles and Future of Acoustic Microscopy. Proceedings of the Joint Soviet-West Germany International Symposium on Microscope Photometry and Acoustic Microscopy in Science, Moscow, Russia, 1-12, 1985.

## HONORS AND AWARDS

### *Russian*

- 1991/93 USSR Academy of Sciences Award for the Project "Microstructure Investigations of High Temperature Super Conductive films and Monocrystals" in National High-Temperature Superconductivity Program.
- 1988/90 USSR Academy of Sciences Award for the Project: "Scanning Acoustic Microscopy for Microstructure Investigations of High Temperature Super Conductive Materials" in National High-Temperature Superconductivity Program.
- 1986 Annual Award for the Best Research Results, USSR Academy of Sciences.
- 1972 Prize in Physics, Moscow Young Scientist Society.

### *International*

- 2007 Canadian Association of Physicists Medal for Outstanding Achievement in Industrial and Applied Physics.
- 2007 Premier Catalyst Award for Start-Up Company with Best Innovation.
- 2006 Award in Recognition from DaimlerChrysler Corporation for Outstanding Research and Development.
- 2005 Award in Recognition of Research and Scholarship Excellence from University of Windsor.
- 2004 Award in Recognition of Research and Scholarship Excellence from University of Windsor.
- 2002 Canada Innovation Summit 2002 Award in Recognition of Contribution to New Knowledge and Technical Innovation.
- 2002 Award in Recognition of Research and Scholarship Excellence from University of Windsor.
- 2002 Award for the Outstanding Research and Development Work from DaimlerChrysler Corporation.
- 2001 Award in Recognition of Research and Scholarship Excellence from University of Windsor.
- 2001 Letter of Recognition from the Deputy Minister of Canada for Research Excellence.
- 2001 Letter of Recognition from DaimlerChrysler Corporation.
- 2000 Award in Recognition of Research and Scholarship Excellence from University of Windsor.

1988	Pioneer Award (Honorary Diploma), The World Federation of Ultrasound in Medicine and Biology and American Institute of Ultrasound in Medicine. International Science Foundation Award, USA.
1987	Centenary Ernst Abbe Medal from the World Microscopical Society.

### TRAINING OF HIGHLY QUALIFIED PERSONNEL

	<u>Completed</u>	<u>Current</u>
Undergraduate & High School	14	3
Graduate – MSc	34	4
Graduate – PhD	13	5
Graduate Exchange Students	7	0
Post Doctorate Fellows	15	2
Research Associates	9	5
Visiting Scientists	10	0
Others	2	2
<b>Total</b>	<b>104</b>	<b>21</b>

### The following graduate students are currently under Dr. Maev's supervision:

- “New Surface Acoustic Waves Theory and Experimental Approaches for Realization of Advanced TAG Algorithms and Systems” by *Wesley Arthur (Ph.D.)*
- “Investigation of Internal Structure and Polymerization Process Using Acoustic Microscopy” by *Eugene Bakulin (Ph.D.)*
- *Evgeny Leshchinsky (Ph.D.)*
- “Numerical Methods Investigation of Image Reconstruction in Ultrasound Intracranial Diagnostics” by *Kiyanoosh Shapoori (M.Sc.)*
- “Signal Processing Methods and Interface Development for Medical Intracranial Diagnostics Ultrasonic Imaging System” by *Lawrence Barsanti (M.Sc.)*
- *Mark Lubrick (M.Sc.)*
- *Md. Moin Bhuiyan (Ph.D.)*
- *Marcin Korzeniowski (Ph.D. – visiting student)*
- *Ghazal Ghodsi (M.Sc.)*

### GRADUATE COURSES TAUGHT (UNIVERSITY OF WINDSOR)

Physics 64-612-03	Winter 2007 M.Sc./Ph.D. Grad. Seminar	1 Semester
Physics 64-510/610	Winter 2007 M.Sc./Ph.D. Grad. Seminar	1 Semester
Physics 64-510/610	Fall 2006 M.Sc./Ph.D. Grad. Seminar	1 Semester
Physics 64-510/610	Winter 2006 M.Sc./Ph.D. Grad. Seminar	1 Semester
Physics 64-612	Fall 1998 Introduction to the Nonlinear Acoustics	1 Semester
Physics 64-612	Fall 1999 Elastic Waves in Solids	1 Semester
Physics 64-613	Winter 2000 Fundamentals of Physical Acoustics	1 Semester
Physics 64-613	Winter 2001 Fundamentals of Physical Acoustics	1 Semester
Physics 64-613	Winter 2002 Introduction to the Nonlinear Acoustics	1 Semester
Physics 64-560/460	Winter 2003 Solid State Physics	1 Semester
Physics 64-560/460	Fall 2003 Solid State Physics	1 Semester
Physics 64-560/460	Winter 2004 Solid State Physics	1 Semester
Physics 64-510/610	Fall 2004 M.Sc./Ph.D. Grad. Seminar	1 Semester
Physics 64-560/460	Winter 2005 Solid State Physics	1 Semester
Physics 64-510/610	Winter 2005 M.Sc./Ph.D. Grad. Seminar	1 Semester
Physics 64-510/610	Fall 2005 M.Sc./Ph.D. Grad. Seminar	1 Semester
Physics 64-560/460	Winter 2006 Solid State Physics	1 Semester
Physics 64-612	Fall 1997 Acoustic Imaging and Acoustic Microscopy	1 Semester

### RESEARCH GRANTS

<u>Years</u>	<u>Funding Source, Support Type and Title of Proposal</u>
	<u>Russian</u>
1993/95	RosShelf Program. Grant in Development of NDE Systems & Methods for Evaluation of Materials and Constructions Reliability in Oil and Gas Industry.
1993/94	All Russian Foundation for Fundamental Investigations. Grant in Micro-Mechanical Study of High-Anisotropic Materials.
1993/94	Ministry of Sciences, Higher Education and Technology Policy of Russia. Grant in Ultrasound Micro-Defectoscopy in Micro-Mechanics.

1991/92	USSR State Committee for Science and Technology. Grant in Acousto-Microscopy for Material Science.	
1988/91	USSR Academy of Sciences. Grant in Material Microstructure.	
1984/87	USSR State Committee for Science and Technology. Grant in Acousto-Microscopy.	
1984/86	USSR Academy of Sciences. Grant in Ultrasound Biological Application.	
1983/85	USSR State Committee for Science and Technology. Grant in Acousto-Optics.	
1980/83	USSR State Committee for Science and Technology. Grant in Biomedical Research.	
	<b>Canadian</b>	
2007/11	Ontario Research Fund. "The Ontario BioCar Initiative".	\$750,000
2006/11	Natural Science and Engineering Research Council Canada (NSERC) – Collaborative Research Grant. "Radial Injection Gas Dynamic Spray Technology for Advanced Coatings".	\$1,160,000
2006/07	Research Contract with Superior Cam Inc. "Die Rebuild Process by Radial Injection Gas Dynamic Spraying (RIGDS)".	\$88,000
2006	Internal University of Windsor Grant. "Canada South Science City Displays".	\$5,081
2004/05	Research Contract with Mercedes Benz. "Adhesive Bond Analyzer".	\$268,000
2004	Research Contract with National Research Council Canada. "Identification of Key Variables for Gas Dynamic Spray Forming (GDSF)".	\$24,700
2003/05	Natural Science and Engineering Research Council Canada (NSERC) – Collaborative Research Grant. "Ultrasonic In-Process Monitoring and Feedback of Spot Weld Quality. Second Phase".	\$422,000
2003/04	Research Contract with Centerline (Windsor) Limited. "Supersonically Induced Spray Technology. Feasibility Study".	\$147,000
2002/07	Natural Science and Engineering Research Council Canada (NSERC) – Industrial Research Chair. "Applied Solid State Physics and Material Characterization".	\$2,767,300
2001	Research Contract with Mercedes Benz. "Developing a Method for Ultrasonic Imaging of Adhesive Joints within BIW – Application".	\$120,750
2000/02	Natural Science and Engineering Research Council Canada (NSERC) – Collaborative Research Grant. "Short Pulse 3D Scanning Acoustic Microscope for Manufacturing Quality Control".	\$832,000
2000/02	Material and Manufacturing Ontario – Enabling Grant. "Nonlinear Acoustic Spectroscopy (NAS): As a New Approach to Material Characterization and Component Quality Assessment".	\$167,077
2000	Canadian Foundation Innovation / Province of Ontario. – Equipment Grant. "Bimolecular Characterization and Dynamics Research Facility".	\$2,085,344 (\$298,950–R. Maev portion)
1999/01	Natural Science and Engineering Research Council Canada (NSERC) – Collaborative Research Grant. "Ultrasonic In-Process Monitoring and Feedback of Spot Weld Quality".	\$215,800
1998/00	Material and Manufacturing Ontario - Collaborative Research Project. "Laser-Acoustic Shape Measurement System for High Speed 3D Form Surface Mapping".	\$135,400
1996/00	Natural Science and Engineering Research Council Canada (NSERC) – Collaborative Research Grant. "Acoustic-Microscopy-Based Procedures and Devices for Rapid Detection of Micro-Defects in Weld Metal Joints".	\$1,391,360

**I. Books**

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- 12 **R.Gr. Maev**. Scanning Acoustic Microscopy. Theory and Applications, Manuscript. Publisher: John Willey and Son - VCH, approx. 450, 2007 (Submitted).
- 11 **R.Gr. Maev** (guest editor). Special Issue on High Resolution Ultrasonic Imaging in Industry, Materials and Biomaterials Applications. IEEE Transaction on Ultrasonics, Ferroelectrics and Frequency Control, 54 (8): August 2007.
- 10 **R.Gr. Maev**, V. Leshchynsky. Introduction to Low Pressure Gas Dynamic Spray, Physics & Technology, Manuscript. Publisher: John Willey and Son - VCH, Weinheim, 264, 2007 (In-press).
- 9 **R.Gr. Maev**. Acoustic Microscopy. Manuscript, Publishing House "Science" Moscow, 384., 2005.
- 8 L. Denisova, **R.Gr. Maev**, Yu. Denisov-Nikolsky, I. Matveichyk. Methods of Acoustic Microscopy for Biomedical Applications. Educational Serial, Moscow, NIC BMT, Russia, 64, 2002.
- 7 **R.Gr. Maev** (editor and co-author). Acoustical Imaging, V. 26. Plenum Press, New York & London, 516, 2002.
- 6 **R.Gr. Maev** (editor and co-author). Physical Sciences and Advanced Vehicle Technologies. Symposium Proceeding, Toronto, 203, June 2000.
- 5 V.M. Levin, **R.Gr. Maev**, T.A. Senjushkina. Scanning Acoustic Microscopy in Biological and Medical Research. Chapter in book "Physical Characterization of Biological Cells", Verlag Gesundheit GmbH, Berlin, 435-451, 1991.
- 4 **R.Gr. Maev**, M. Hoppe (editor and co-author). Microscope Photometry and Acoustic Microscopy in Science. Proceedings of the FRG-USSR Symposium, Moscow, 231, 1985.
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- 2 V.M. Levin, **R.Gr. Maev**, V.V. Proklov. Sound and Light: Interaction in the Media. Book series: News in Science and Technics. Moscow, N 5, 90, 1981.
- 1 **R.Gr. Maev**, A. G. Malenkov (editors and co-authors). Methods of Medical Biophysics Lab. Practice. in two vol. Publ. in Moscow Physical-Technical University, Moscow, 80, 1980.

**II. Articles in Refereed Journals**

93. M. Lubrick, **R.Gr. Maev**, V. Leshchynsky, Young's Modulus of Metal-Matrix Composites Made by Low Pressure Gas Dynamic Spray, Journal of Material Science, 2007, (submitted).
92. S.A. Titov, **R.Gr. Maev**, A.N. Bogachenkov, Pulse Echo NDT of Adhesive-bonded Joints in Automotive Assemblies, Ultrasonics, 2007 (in press).
91. J. Sadler and **R.Gr. Maev**. Experimental and Theoretical Basis of Lamb Waves and Their Applications in Material Sciences. Review. Canadian Journal of Physics, 85 (7): 707-731, 2007.
90. A. Chertov, **R.Gr. Maev**, Fedar Severin. Acoustic Microscopy of Internal Structure of Resistance Spot Welds. IEEE Transaction on Ultrasonics, Ferroelectrics, And Frequency Control, 54(8): 1521-1529, 2007.
89. A.M. Siddiolo, L. D'Acquisto, A.R. Maeva, **R.Gr. Maev**. Wooden Panel Painting Study: An Air-Coupled Ultrasonic Imaging Approach. IEEE Transaction on Ultrasonics, Ferroelectrics, And Frequency Control, 54 (4): 836 - 846, 2007.
88. **R.Gr. Maev**, R.E. Green Jr., A.M. Siddiolo. Review of Advanced Acoustical Imaging Techniques for Nondestructive Evaluation of Art Objects. Research in Nondestructive Evaluation, 17 (4): 191-204, 2006.
87. L. Denisova, **R.Gr. Maev**, V.K. Leontiev, A.F. Denisov, D. Gavrilov, F. Rusanov, G. Grayson, F.M. Severin. Experimental Study of Non-Invasive Acoustic Microscopy Methods for Application in Implantation. Biomedical Technologies, 70-79, 2006.
86. E.A. Khramcova, A.R. Maeva, L. Denisova, I.V. Matveichyk, **R.Gr. Maev**. Non-Invasive Human Skin Research Study Using Acoustic Microscopy Methods. Journal of Biomedical Technologies, 250-260, 2006.
85. B. O'Neill, **R.Gr. Maev**. Application of a Nonlinear Boundary Condition Model to Adhesion Interphase Damage and Failure. Journal of the Acoustical Society of America, 120 (6): 3509-3517, 2006.
84. B. O'Neill, **R.Gr. Maev**. Acousto-Elastic Measurement of the Fatigue Damage in Waspaloy. Journal of Research in Nondestructive Evaluation, 17 (3): 121-135, 2006.
83. **R.Gr. Maev**. Development of Novel Principles and Methods of High Resolution Acoustical Imaging for Materials Characterization. Review. Physics in Canada, 62 (2): 91-98, 2006.
82. L. Denisova, **R.Gr. Maev**, E. Khramcova, O. Dadasheva, A.F. Denisov, E. Snetkova. Application of SAM for Investigation of Embryonic Growth of Japanese Quail. Journal of Technology for Living Systems, 3 (1): 56-63, 2006.
81. **R.Gr. Maev**, V. Leshchynsky. Air Gas Dynamic Spraying of Powder Mixtures: Theory and Application.

- Journal of Thermal Spray Technology, 15 (2): 198-205, 2006.
- 80 S. Titov, **R.Gr. Maev**, A.N. Bogachenkov. A Pulse Ultrasonic Gauge for Measuring Surface Acoustic Waves Velocities. Journal of Instruments and Experimental Techniques, 49 (1): 113-139, 2006.
- 79 S.A. Titov, **R.Gr. Maev**, A.N. Bogachenkov. Measurements of Velocity and Attenuation of Leaky Waves Using an Ultrasonic Array. Journal of Ultrasonics, 44 (2): 182-187, 2006.
- 78 A.M. Siddiolo, A.R. Maeva, L.D'Acquisto, **R.Gr. Maev**. Wooden Panel Painting Study: An Air-Coupled Ultrasonic Imaging Approach. IEEE Transaction on Ultrasonics, Ferroelectrics, And Frequency Control, 54 (4): 836-846, 2007.
- 77 L. Denisova, I. Matveichyk, Yu.I. Denisov-Nikolski, **R.Gr. Maev**, A.F. Denisov. Modern Concept in Quantitative Characterization of Hard Tissue Objects Using Acoustic Microscopy. Journal of Biomedical Technologies, 24: 59-69, 2006.
- 76 A.F. Denisov, E.Yu. Bakulin, N.M. Livanova, A.A. Popov, **R.Gr. Maev**, L. Denisova. Investigation of the Microstructure and Physical-Mechanical Properties of Mixtures of Butadiene-Nitride Rubber with PVC with Different Contents by Methods of Acoustical Microscopy. Chemical Physics, 7: 243, 2006.
- 75 A. Chertov, **R.Gr. Maev**. One-Dimensional Model of Acoustic Wave Propagation in the Multilayered Structure of the Spot Weld. IEEE Transaction on Ultrasonics, Ferroelectrics, And Frequency Control, 52 (10): 1783-1790, 2005.
- 74 J. Sadler, B. O'Neill, **R.Gr. Maev**. Ultrasonic Wave Propagation Across a Thin Nonlinear Anisotropic Layer Between Two Half-Spaces. Journal of the Acoustical Society of America, 118 (1): 51-59, 2005.
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- 69 L. Denisova, **R.Gr. Maev**, I.Ya. Poyurovskaya, T. Grineva, A.F. Denisov, E.Yu. Maeva, E. Bakulin. The Use of Acoustic Microscopy to Study the Mechanical Properties of Glass-Ionomer Cement. Dental Materials, 20: 358-363, 2004.
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- 67 E.Yu. Maeva, I. Bruno, B. Zielinsky, M. Docker, F. Severin, **R.Gr. Maev**. The Use of Pulse-Echo Acoustic Microscopy to Invasively Determine Sex of Living Larval Sea Lamprey, Petromyzon Marinus. Journal of Fish Biology, 65: 148-156, 2004.
- 66 H.T. Lee, M. Wang, **R. Gr. Maev**, E.Yu. Maeva. A Study on Using Scanning Acoustic Microscopy and Neural Network Techniques to Evaluate the Quality of Resistance Spot Welding. International Journal of Advanced Manufacturing Technology, 22: 727-732, 2003.
- 65 S. Titov, **R.Gr. Maev**, A. Bogachenkov. Wide-Aperture, Line-Focused Ultrasonic Material Characterization System Based on Lateral Scanning. IEEE Transaction on Ultrasonics, Ferroelectrics, And Frequency Control, 50 (8): 1046-1056, 2003.
- 64 L. Denisova, **R.Gr. Maev**, I.Yu. Poyurovskaya, A.F. Denisov, T.V. Grineva, E.Yu. Maeva, E.Yu. Bakulin. Comparative Investigation of the Glassionomer Cements "Dentis" Microstructure and Mechanical Properties. Journal of Mechanical Composites Materials, 9 (1): 24-33, 2003.
- 63 L. Denisova, N. Nasirova, **R.Gr. Maev**, A.S. Grigorian, L.A. Grigorianz, A.A. Denisov, T.V. Grineva, E.Yu. Maeva, F.M. Severin. Investigation of the Microstructure of Dental Sealing Materials Using Methods of Acoustical Microscopy. Journal of Stomatology, 81 (1): 26-31, 2003.
- 62 **R.Gr. Maev**, L. Denisova, E.Yu. Maeva, A. Denisov, A. Krasnov, V. Popov, A. Popova, E. Bakulin. Investigation of the Microstructure of Medical Polyamide and Hydroxiapatite Polymer Composites Using Acoustic Microscopy Methods. "News in Dentistry", 101 (1): 84-90, 2002.
- 61 **R.Gr. Maev**, L. Denisova, E.Yu. Maeva, A. Denisov. New Data on Histology and Physical Mechanical Properties of Human Tooth Tissue Obtained with Acoustic Microscopy. Journal "Ultrasound in Biology in Medicine", 341-357, 2002.
- 60 G.V. Morozov, **R.Gr. Maev**, G.W.F. Drake. Explicit Convergence of Born Series for Simple Perturbations: Comparison with Multiple Reflection Approach. Physics in Canada, 127, 2001.
- 59 G.V. Morozov, **R.Gr. Maev**, G.W.F. Drake. Reflection of Plane Electromagnetic Waves from Two-Layered Periodic Structures with Fluctuations in Layer Thickness. Physical Review D, 64: 3456-3467, 2001.
- 58 S. Titov, **R.Gr. Maev**, A. Bogachenkov. Measurements of the Velocity and Attenuation of the Leaky Surface Acoustic Waves Using Dual-Channel Acoustic Microscopy Method. Journal of Applied Physics (JTP), 27 (4):

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- 57 **R.Gr. Maev**, J. Sokolowski, H. Lee, E.Yu. Maeva, A. Denisov. Bulk and Subsurface Structure Analysis of the 319 Aluminum Casting Using Acoustic Microscopy Methods. Journal for Material Characterization, 46 (2): 263-326, 2001.
- 56 **R.Gr. Maev**, Yu. Maximovsky, L. Denisova, E.Yu. Maeva, A. Denisov, T. Chirkova, D. Domyshev. Acoustic Microscopy - New Method for Teeth Investigation. Journal of Stomatology, 79 (5): 14-20, 2000.
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- 54 S. Titov, **R.Gr. Maev**, A. Bogachenkov. Two-Channel Measuring Acoustic Microscope. Journal of Scientific Tool and Experimental Methods, 43 (2): 275-278, 2000.
- 53 **R.Gr. Maev**, L. Denisova, E.Yu. Maeva, A.A. Ptchelintsev, A. Denisov. Investigation of the Microstructure and Quantitative Evaluation of Biomechanical Properties of Dentin Using Microscopy Technique. Journal of Biomedical Technology, 24 (10): 164-175, 2000.
- 52 Y. Zheng, **R.Gr. Maev**, I.Yu. Solodov. Nonlinear Acoustic Applications for Material Characterization: Review. Canadian Journal of Physics, 927-979, 1999.
- 51 G.V. Morozov, **R.Gr. Maev**, G.W.F. Drake. Exact Analytic Expression for the Reflection of the Electromagnetic Wave from a Two-Layered Periodic Dielectric Structure. Physical Review E, 60: 4860-4867, 1999.
- 50 G.V. Morozov, **R.Gr. Maev**, G.W.F. Drake. Analytical Solution for Refraction of Electromagnetic Wave from Two-Layer Dielectric Periodic Structure. Journal of Quantum Electronics, 28 (11): 974-1001, 1998.
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- 45 **R.Gr. Maev**, V.M. Levin. Principles of Local Sound Velocity and Attenuation Measurements Using Transmission Acoustic Microscope. IEEE Transaction on Ultrasonics, Ferroelectrics, and Frequency Control, 44 (6): 1224-1231, 1997.
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### III. Refereed Conference Proceedings

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- 208 S. Harma, W. G. Arthur, C. S. Hartmann, **R. Gr. Maev**, V. P. Plesky; Inline SAW RFID Tag Using Time Position and Phase Encoding . International IEEE Ultrasonics Symposium, New York, USA, October 28-31, 2007,
- 207 **R. G. Maev**, V. D. Svet; Acoustical Imaging in Inhomogeneous Media and the Human Eye, International IEEE Ultrasonics Symposium New York, USA, October 28-31, 2007,
- 206 J. Sadler, **R. G. Maev**, A Ray Technique To Calculate Multiple Reflections And Transmitted Waves From Layered Media International IEEE Ultrasonics Symposium New York, USA, October 28-31, 2007,
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**(f) Estimated space requirements for the first five-year period.**

Many of the Institute's projects will be carried out in the research facilities already available to the Principal Investigator of the project in question. The City of Windsor has agreed to be a stakeholder in the proposed Institute and make available approximately 7,000 ft<sup>2</sup> of high-value space, for a minimum of three years to provide a transitional space for the Institute, with the opportunity for renewal. The space requirements are project-specific and depend upon a number of factors and hence are not individually estimated here.

It is envisaged that the physical space directly associated with the Institute would ultimately be 36,000 ft<sup>2</sup>. This space could be found through a new building initiative, one that has already been proposed for future construction in downtown Windsor.

Alternatively, the Dean of Engineering has expressed an interest in having the Institute’s facilities located in the new engineering building planned for the campus as it will complement the innovation initiatives proposed by the Faculty of Engineering.

Some Institute projects will be located in the facilities of the projects’ collaborative partner(s) and will not require any dedicated space from the University.

**(g) Detailed list of existing capital equipment and other facilities which may be made available to the Institute.**

It is not envisaged that existing capital equipment and other University facilities will be used extensively by the proposed Institute. The nature of the rapidly evolving technologies that will be used in Institute projects requires that new and emerging equipment will be acquired on a project by project basis. The Institute has no dedicated existing physical space. Currently projects are being carried out in the research facilities already available to the Principal Investigator of the project in question. Space for the Institute, both transitional and permanent, is discussed in the preceding section.

**(h) List of projected equipment acquisitions for the first five-year period.**

The research and innovation efforts of the Institute are carried out within the framework of externally funded projects. The budgets for these projects allows for the purchase of any required equipment. As the equipment acquisitions are project-specific they can not generally be listed in advance of the projects being approved by the Institute. The three inaugural research and innovation projects to be carried out by the Institute have allocated the following funds to acquire equipment:

- Project 1. (Industrial Project) Equipment Acquisition: \$424,271
- Project 2. (Biometric Project) Equipment Acquisition: \$424,271
- Project 3. (Medical Project) Equipment Acquisition: \$82,119

For a total of **\$930,661.00**

**(i) Projected utilization of other University facilities and resources.**

The Institute is a distributed research consortium that provides a coherent research and commercialization initiative, with the necessary critical mass and stimulating environment for its members as they work primarily in their current distributed research facilities. The Institute will provide a common space and specialized project-based resources that researchers working in the Institute’s areas of focus have the potential to share so as to enhance their innovation productivity. As each Institute project will be fully funded from external sources it is not expected that there will be any undue utilization of University facilities and resources.

**(j) Projected staff requirements including research associates, postdoctoral fellows, technical and support staff, graduate students, etc., as appropriate to the Institute.**

The staff requirements for the Institute and the three inaugural projects are given in the following table. The research associates, postdoctoral fellows, technical, support staff are primarily associated with a specific Institute project and are funded from that project.

<b>Institute Staff</b>
Development Officer (1/2) Institute Manager Support Secretary
<b>Project 1</b>
Project Manager (1/2) Support Secretary Innovation Staff (5) HQP (\$90K) *
<b>Project 2</b>

Project Manager (1/2) Support Secretary Innovation Staff (5) HQP (\$90K) *
<b>Project 3</b>
Project Manager (1/2) Development Officer (1/2) Innovation Staff (2) HQP (\$90K) *

\* Each of the three inaugural projects have funding to support research associates, postdoctoral fellows, technical and support staff, graduate students, *etc.*, as appropriate to the specific Institute project. An amount of \$270,000.00 has been allocated among the three projects for the development of highly qualified personnel (HQP). It is envisaged that the support of graduate and undergraduate students who are not classified as innovation staff would come from this amount.

**(k) Identified sources and prospects for funding of the new Institute by outside agencies.**

The funding for the proposed Institute is outlined in the following three (3) sections:

**(a) Funding that has already been committed (Institute Operation and Project Funding: \$7,000,000)**

<b>INSTITUTE OPERATING FUNDING</b>			
Funding Agency	Amount	Period	
Ministry of Research and Innovation <sup>1</sup>	\$150,000	Over 3 years	
Chrysler Corporation <sup>2</sup>	\$1,000,000	Over 5 years	
University of Windsor	\$1,000,000	Over 5 years	
<b>Subtotal</b>	<b>\$2,150,000</b>		
<b>INSTITUTE PROJECT FUNDING</b>			
Funding Agency	Amount	Period	Project
Ministry of Research and Innovation <sup>1</sup>	\$1,940,000	Over 3 years	1. Industrial Project
Ministry of Research and Innovation <sup>1</sup>	\$1,940,000	Over 3 years	2. Biometric Project
Ministry of Research and Innovation <sup>1</sup>	\$970,000	Over 3 years	3. Medical Project
<b>Subtotal</b>	<b>\$4,850,000</b>		
<b>TOTAL</b>	<b>\$7,000,000</b>		
<b>Notes:</b>			
1. MRI will transfer a total of \$5,000,000 to the University of Windsor on June 30, 2008. These funds are for an initial 3 year period.			
2. The Chrysler Corporation will assess its five year commitment on an annual basis.			

**(b) Recently initiated projects (total value of \$7,889,782)**

A number of research initiatives to attract funding to the proposed Institute have already been started and they are compiled as follows:

<u>Years</u>	<u>Funding Source, Support Type and Title of Proposal</u>	<u>P.I.</u>	<u>Amount</u>
2008-2012	NSERC – Industrial Research Chair with Chrysler and University of Windsor – Renewal (Applied for) <i>“Applied Solid State Physics and Material Characterization”.</i>	R. Maev	\$3,833,782
2008-2009	Ontario Centres of Excellence – Champions of Innovation Grant <i>“Nanotechnology Based Solid Lubricant Tread Patterning made using Innovative Gas Dynamic Spray Technology for Fabrication of Oil-Free Sliding Components for Automotive Applications”</i>	R. Maev	\$162,000
2007-2011	Ontario Research Fund (consortium with 4 Universities) <i>“The Ontario BioCar Initiative”</i>	R. Maev Collaborators	\$686,250 (R Maev portion)
2006-2011	NSERC – Collaborative Research and Development Grant with Centerline Windsor Ltd. <i>“Radial Injection Gas Dynamic Spray Technology for Advanced Coatings”</i>	R. Maev	\$3,207,750
<b>Total Funding for these Projects</b>			<b>\$7,889,782</b>

**(c) Future Proposed projects (total value of \$6,300,000)**

Based on current R&D activity and recent initiatives it is expected that the new Institute projects during the next 2-4 years will also involve the following collaborative partners and projects worth a total of \$6,300,000 as follows:

**Industrial Diagnostics Area: (total estimated value \$2,800,000)**

**Chrysler** - ultrasonic real-time quality characterization of aluminum welding processes (estimated 2 year project with a budget of about \$400,000).

**Magna International** - laser welding process control and weld quality assurance (estimated 3 year project with a budget of about \$500,000).

**Bombardier** - resistance spot welding of dissimilar metals using cold sprayed transition layers (estimated 2 year project with a budget of about \$400,000).

**DARPA (USA)** - joining dissimilar specific metals and metal alloys using cold sprayed transition layers with on-line welding quality assurance controlled (estimated 3 year project with a budget of about \$1,500,000).

**Biometrics Diagnostics Area: (total estimated value \$1,200,000)**

**National Law Enforcement and Corrections Technology Center of the National Institute of Justice (USA)** - high resolution ultrasonic method and portable device for 3D fingerprint representation in biometrics

**Canadian Federal Agencies and Private Sector** - high resolution ultrasonic method and portable device for 3D fingerprint representation in biometrics.

(These two biometric projects are estimated to be a 2 year project with a combined budget of about \$1,200,000).

**Medical Diagnostics Area: (total estimated value \$2,300,000)**

**Institute for Biodiagnostics (NRC)** - to develop a combined system for multifunctional dental diagnostics, based on laser and ultrasonic diagnostic procedures (estimated 2 year project with a budget of about \$400,000).

**Institute for Biodiagnostics (NRC)** - to develop a combined system for multifunctional diagnostics of internal organs, based on MRI and ultrasonic diagnostic procedures (estimated 2 year project with a budget of about \$500,000).

**National Institutes of Health (USA)** - to develop new technical solutions to rapid initial diagnosis of internal organs (e.g. kidneys, liver, etc.) (estimated 3 year project with a budget of about \$600,000).

**Office of Naval Research (USA)** - to develop a portable pulmonary injury diagnostic device and test method (estimated 2 year project with a budget of about \$800,000).

**The amount of Institute funding as set out in the preceding sections (a), (b) and (c) totals:**

INSTITUTE FUNDING	AMOUNT
Committed by funding source	\$7,000,000
In Progress (under negotiation)	\$7,889,782
Future (next 2-4 years)	<u>\$6,300,000</u>
<b>TOTAL</b>	<b>\$21,189,782</b>

**(I) Budget properly constructed to show income and expenditures, with details for the first year, and projections over a five-year period. (Committed Funding Only)**

The Institute budget (less facility costs) shown in the following table includes the three initial funding sources: the Ontario Ministry of Research and Innovation, the Chrysler Corporation, and the University of Windsor.

INSTITUTE BUDGET	SOURCE	Year 1	Year 2	Year 3	Year 4	Year 5
New Projects Development	MRI	\$10,000	\$10,000	\$10,000	\$0	\$0
Development Officer (1/2)	MRI	\$40,000	\$40,000	\$40,000		
<b>Subtotals:</b>	<b>\$150,000</b>	<b>\$50,000</b>	<b>\$50,000</b>	<b>\$50,000</b>	<b>\$0</b>	<b>\$0</b>
Institute Infrastructure	CHRYSLER	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Attract New Projects	CHRYSLER	\$150,000	\$150,000	\$150,000	\$150,000	\$150,000
<b>Subtotals:</b>	<b>\$1,000,000</b>	<b>\$200,000</b>	<b>\$200,000</b>	<b>\$200,000</b>	<b>\$200,000</b>	<b>\$200,000</b>
Institute Manager (S&B)	UofW	\$120,000	\$123,600	\$127,308	\$131,127	\$135,061
Support Secretary (S&B)	UofW	\$55,000	\$56,350	\$57,741	\$59,173	\$60,648
Supplies	UofW	\$5,000	\$3,050	\$1,951	\$1,700	\$791
Communications and Reports	UofW	\$5,000	\$5,000	\$2,000	\$2,000	\$1,000
Travel	UofW	\$15,000	\$12,000	\$6,000	\$6,000	\$2,500
<b>Subtotals:</b>	<b>\$1,000,000</b>	<b>\$200,000</b>	<b>\$200,000</b>	<b>\$200,000</b>	<b>\$200,000</b>	<b>\$200,000</b>
<b>TOTALS</b>	<b>\$2,150,000</b>	<b>\$450,000</b>	<b>\$450,000</b>	<b>\$450,000</b>	<b>\$400,000</b>	<b>\$400,000</b>

**NOTES:**

- MRI funding will be used to provide support for new projects development and a Development Officer who will focus on generating new projects for the Institute.
- The Chrysler Corporation finalizes their contributions on a year-by-year basis and the continuing expected amounts are shown for years 2 to 5 in the five year budget.

The Ontario Ministry of Research and Innovation has initially funded three Institute projects. These amounts are in addition to the budget of \$2,150,000 for the operation of the Institute. The Institute will ensure the successful realization of three different projects that will utilize new common core enabling research that will support new high-resolution acoustical imaging technology and will lead to proof-of-concept-demonstrations in three distinct and uncorrelated areas suitable for global commercialization. The amounts allocated to the individual projects are: Industrial \$1,940,000; Biometrics \$1,940,000; and, Medical Diagnostics \$970,000 (Total project funding is \$4,850,000). The three initial projects budgets are summarized in the following tables.

**Project 1. Budget (Industrial Project)**

Item	Year 1	Year 2	Year 3	Totals
Project Manager (S&B) (1/2)	\$60,000	\$61,200	\$62,436	\$183,636
Support Secretary (S&B)	\$50,000	\$51,200	\$52,137	\$153,337
Innovation Staff (5)	\$250,000	\$259,000	\$268,270	\$777,270
Consulting Services	\$35,000	\$35,000	\$18,000	\$88,000
Equipment/Components	\$150,000	\$150,000	\$124,271	\$424,271
Supplies	\$12,000	\$11,486	\$10,000	\$33,486
Communications and Reports	\$15,000	\$15,000	\$15,000	\$45,000
Travel	\$25,000	\$25,000	\$25,000	\$75,000
Proof-of-Concept Demonstration	\$0	\$20,000	\$50,000	\$70,000
HQP Development	\$30,000	\$30,000	\$30,000	\$90,000
<b>Totals:</b>	<b>\$627,000</b>	<b>\$637,886</b>	<b>\$675,114</b>	<b>\$1,940,000</b>

**Project 2. Budget (Biometric Project)**

Item	Year 1	Year 2	Year 3	Totals
Project Manager (S&B) (1/2)	\$60,000	\$61,200	\$62,436	\$183,636
Support Secretary (S&B)	\$50,000	\$51,200	\$52,137	\$153,337
Innovation Staff (5)	\$250,000	\$259,000	\$268,270	\$777,270
Consulting Services	\$45,000	\$45,000	\$18,000	\$88,000
Equipment/Components	\$140,000	\$140,000	\$124,271	\$424,271
Supplies	\$12,000	\$11,486	\$10,000	\$33,486
Communications and Reports	\$15,000	\$15,000	\$15,000	\$45,000
Travel	\$25,000	\$25,000	\$25,000	\$75,000
Proof-of-Concept Demonstration	\$0	\$30,000	\$40,000	\$70,000
HQP Development	\$30,000	\$30,000	\$30,000	\$90,000
<b>Totals:</b>	<b>\$627,000</b>	<b>\$647,886</b>	<b>\$665,114</b>	<b>\$1,940,000</b>

**Project 3. Budget (Medical Project)**

Item	Year 1	Year 2	Year 3	Totals
Project Manager (S&B) (1/2)	\$60,000	\$61,200	\$62,436	\$183,636
Develop. Officer (S&B)(1/2)	\$40,000	\$41,200	\$42,137	\$123,337
Innovation Staff (2-with IBD NRC)	\$120,000	\$123,600	\$127,308	\$370,908
Equipment/Components	\$40,000	\$20,000	\$22,119	\$82,119
Supplies	\$10,000	\$10,000	\$5,000	\$25,000
Communications and Reports	\$5,000	\$5,000	\$5,000	\$15,000
Travel	\$10,000	\$10,000	\$10,000	\$30,000
Proof-of-Concept Demonstration	\$0	\$0	\$50,000	\$50,000
HQP Development	\$30,000	\$30,000	\$30,000	\$90,000
<b>Totals:</b>	<b>\$315,000</b>	<b>\$301,000</b>	<b>\$354,000</b>	<b>\$970,000</b>

**SUMMARY**

Institute Operating Funding	\$2,150,000
Institute Project Funding	\$4,850,000
<b>TOTAL</b>	<b>\$7,000,000</b>



7.1 The Steering Committee shall be composed of the Chair, the Vice-Chair and the Recording Secretary of the Senate and the chairs of the standing committees of the Senate. Whenever the membership of the Steering Committee is such that an academic unit is not represented, the Senators of that academic unit shall elect one of their number to the Steering Committee. According to their official website, the Senate Democratic Steering and Outreach Committee (DSOC) is a committee dedicated to fostering dialogue between Senate Democrats and community leaders across the nation. The Steering Committee hosts several meetings each year with advocates, activists, policy experts, and elected officials to help the structuring of the Democrats' agenda in the United States Senate. Hillary Clinton, NY (2003â€“2007). Debbie Stabenow, MI (2007â€“2011). Mark Begich, AK (2011â€“2015). The Senate Steering Committee comprises five Senators, including the Senate Chair, who also chairs the Senate Steering Committee. They are elected by Senators from among themselves. President, Provost & Chief Planning Officer/Registrar are ex officio members of the Senate Steering Committee. The Senate Steering Committeeâ€™s responsibilities include: Appoint the Committee on Committees from among Senators, as well as approve the appointment of members of committees.